2004 ARMY MODERNIZATION PLAN

RELEVANT AND READY LAND POWER FOR THE JOINT FORCE

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DEPARTMENT OF THE ARMY
THE ARMY G-8
700 ARMY PENTAGON
WASHINGTON, DC 20310-0700

REPLY TO
ATTENTION OF

June 2004

SUBJECT: 2004 Army Modernization Plan

In the past year the Army has successfully engaged in prosecuting the ongoing global war on terrorism. Our Army has been simultaneously at war while transforming itself for future requirements. Throughout this process, the Army remains fully committed and prepared to support the nation's interests and provide the best possible sustained land power for our Joint Force. Our Army must always remain "relevant and ready", and we are committed to ensuring this objective. This commitment has been visible in the superb actions of our Soldiers and units in Operation Iraqi Freedom and Operation Enduring Freedom, as well as in the impressive array of Army deployments and missions at home and abroad.

For the past four years, the annual *Army Modernization Plan* has provided a report on the Army's efforts to support and implement its transformation while simultaneously preserving its essential readiness. The *2004 Modernization Plan* updates this course and reports on recent accomplishments based on past efforts as well as adjustments being made that take into account the urgent demands of today's missions and opportunities for applying significant technological improvements. It describes the flexible modernization and investment strategies that place priority on providing the best capabilities for the Army's Current Force while supporting a process of change that ensures improved future capabilities are likewise being developed and can be inserted as soon as possible.

This modernization plan describes Army efforts to build combat capable units using a comprehensive and balanced approach. Success ultimately depends on our Soldiers and the people supporting them, and it involves more than materiel alone; thus, this year's plan continues to include annexes on an array of important areas such as doctrine, organizations, training and leader development, personnel, and installations.

Congress and the Department of Defense have responded positively by providing the resources for today's Army and for tomorrow's improved force. The Presidential Budget for fiscal year 2005 reflects continued support for this essential path of supporting our Soldiers at war and investing in the Army's readiness for tomorrow. Sustained and additional efforts are essential for our success and the nation's security.

BENJAMIN S. GRIFFIN
Lieutenant General, U.S. Army
The Army G-8

2004 ARMY MODERNIZATION PLAN

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2004 Army Modernization Plan

Table of Contents

2004 Army Modernization Plan

Executive Summary

Our Army at War—Relevant and Ready

The U.S. Army, a vital member of the Armed Forces joint team, remains fully engaged in an ongoing global war on terrorism and with other enemies that confront our nation. Over 325,000 Soldiers from our Army are currently deployed in 120 countries, with approximately 125,000 Soldiers in Iraq, Afghanistan and Kuwait alone. A significant portion of that force comes from our Reserve Component—Army National Guard and Army Reserve. They are an indispensable part of the Army team and comprise over 50 percent of the total Army. Our primary focus in this war is on supporting the magnificent Soldiers that make up this force. The effective training and equipping of these Soldiers are indispensable to the success of today's Army—our Current Force—and represent an enduring and unalterable commitment. This commitment is clearly affected by the Army's significant participation in the ongoing war and the increased operational tempo, and there is a resulting major impact on our equipment, prepositioned stocks and ammunition inventories. The Army faces serious challenges that will require continued and additional resourcing in order to maintain the proper level of support to our Soldiers and ensure uninterrupted readiness.

Along with maintaining today's readiness, the Army is also investing in tomorrow's readiness by pursuing a comprehensive process to transform our capabilities and continually evolve into a Future Force that preserves its relevance and improves its ability to accomplish all missions. The capabilities of today's Army, however, must be the instrument for fighting and winning the global war on terrorism. We are now incorporating, to the maximum extent possible, maturing technologies from our investments in future capabilities. In effect, we are conducting an "in-stride" transformation that supports our Army at war today, while simultaneously developing improved capabilities for the future. As an integral part of this ongoing process, we have recently initiated a major initiative to restructure the Army into more modular formations, which will allow us to provide increased force density and capabilities essential for the immediate future as well as the foundation for the longer-term force. This restructuring initiative is well underway to produce an additional ten brigades in its initial phase.

With the active support of Congress and the Department of Defense, the Army continues building on the significant efforts made during the past four years to implement an ambitious process of transforming into an even more capable force. This process of change, building on a long history of continuing change and adaptation in the Army, has already produced tangible improvements. New combat organizations—the Stryker Brigade Combat Teams—are being fielded today as part of the Joint Force. Other advancements are also being made in developing new technologies and capabilities for the longer term.

Throughout this endeavor, however, the Army has had to carefully assess and balance the risks of near-term requirements and the needs for the future. To accomplish this, we have employed a flexible strategy of "balanced modernization" to maintain the proper mix of priorities, efforts and investments. This strategy includes a dynamic reevaluation in light of changing operational requirements and policy guidance. To assist in this continual rebalancing, and in light of the immediate requirements for current operations, the Army leadership identified immediate focus areas to examine specific changes needed to enhance the readiness of the force. Some results of this self-examination process will be incorporated into plans and programs in the immediate future. Others will be incorporated over a longer period. Throughout all of these efforts, the Army remains firmly committed to succeeding in our major core competencies; training and equipping Soldiers, growing leaders, and providing relevant and ready land power to the Combatant Commanders and the Joint Force.

The *2004 Army Modernization Plan* describes the Army's modernization and investment strategies, the specific means of implementing the Army's plans to maintain and improve the Current Force while developing and fielding a Future Force with increased capabilities. The ultimate goal is building, fielding and maintaining combat-capable units that will deliver sustained land power across the full range of possible missions. This modernization plan's annexes also discuss how the Army is adapting to this challenge throughout its doctrine, organizations, training, materiel, leadership and education, personnel and facilities.

Modernization and Investment in Today's Readiness and Tomorrow's Capability

Modernization is a continuous process of developing and fielding warfighting capabilities for the Army to provide to the Joint Force for use in a joint, interagency and multinational environment. These activities are facilitated and optimized by sound modernization and investment strategies specifically designed to implement the Army's transformation process and provide clear priorities and focus for equipment resource allocation. The overall Army modernization strategy focuses on providing capabilities necessary for the Current Force, while supporting a transformation process to build capabilities essential for the future. To clearly define the focus for its implementation, the modernization strategy consists of the following two parts:

- Maintaining and improving essential warfighting capabilities of the Current Force through an integrated program of selected and responsive modernization and focused recapitalization. This includes the fielding of immediate operational capabilities by organizing and equipping six brigade-sized units outfitted with a family of internetted Stryker combat vehicles and other state-of-the-art, off-the-shelf technologies. Another critical element is an accelerated effort to insert, where feasible, newly developed capabilities derived from emerging technologies and recent lessons learned. In light of the continuing demands on our Soldiers and their equipment, the Army has also initiated an aggressive reset program to return equipment and units to operational readiness for future missions while incorporating organizational changes to make units more modular. Lastly, the Army is beginning a major restructuring effort,

facilitated by a recently approved temporary increase of 30,000 in manning, that will build upon initiatives in force stabilization, modularity, and Active and Reserve Component rebalancing to significantly increase the readiness, number and responsiveness of Army brigades.

- Science and technology efforts to enable timely fielding of the Future Forces and, in particular, the Future Combat Systems—the networked family of systems and the foundation of that force. Investments of over $11 billion identified in last year's budget for this purpose have been continued in this year's budget submission. Of this amount, 97 percent is specifically targeted for the Future Force. Beside these science and technology investments, an additional $3 billion increase has been made in this year's budget to develop the Future Combat Systems and supporting Complementary Systems for the Unit of Action—the Future Force's structural foundation. New capabilities that are developed during this process will be inserted into Current Force units where appropriate and affordable.

Adapting to Current Missions and Meeting Future Requirements

Today's Army is both fully engaged in the global war on terrorism and committed to the process of change. Campaign-quality Army forces possessing increased joint and expeditionary capabilities are the objective of our ongoing and future efforts.

The Army intends to provide an even more ready and relevant land force for use as part of the Joint Force. Encouragement and direct support from Congress and the Department of Defense have been invaluable in facilitating the Army's transformation efforts to date and meeting the new operational demands we are facing in the global war on terrorism. Additional fiscal support is essential as we adjust our plans to meet new requirements associated with operational demands. The FY05 President's Budget reflects the Army's continued refinements to ensure readiness today. While we remain firmly committed to developing tomorrow's force, we must and will provide our Soldiers the best possible capabilities for today's battles. To achieve and maintain these capabilities, the Army requires robust and flexible resourcing in the FY05 budget as well as focused support in any potential supplemental funding measures that the Department of Defense and Congress may deem appropriate and necessary. This support is essential for the Army to maintain progress on our aggressive path to build a more capable force and succeed in the war effort today, which is our overriding strategic imperative and commitment to the nation.

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2004 Army Modernization Plan

Overview

The Army today—Active and Reserve Components—is fully committed as a critical member of the joint team abroad and at home in fighting the nation's wars and preserving its security. From Iraq, Afghanistan and Kuwait—where our Soldiers are engaged in securing and building new and stable democracies and combating global terrorism—to Korea, Bosnia and Kosovo, where tens of thousands more of our Soldiers are ensuring those regions' continued stability—to here at home, where additional thousands are actively engaged in domestic security, the U.S. Army stands ready to accomplish any mission. While successfully engaged in these missions at home and abroad, the Army also continues to transform itself into a force that can field new capabilities and be an even more relevant and ready member of the Joint Force—today and in the future. The challenge to adapt and change while simultaneously fighting the nation's wars and confronting our enemies is daunting, but it is one that the Army accepts and is intent on meeting.

The Current Force is the Army available to the nation at any point in time, and it is this force that will always be called upon to defend the nation's interests. Preserving the warfighting readiness and improving the capabilities of this force are an enduring priority for the Army, and the Soldier is the centerpiece of the Army's overall efforts in this regard. The Soldier deployed today is the Army's greatest asset and remains the focus of efforts in the near term and into the future, as the Army continuously transforms itself into an even more capable, flexible and responsive force.

The combat operations in Iraq and the subsequent and ongoing security and stabilization missions in Iraq and Afghanistan vividly demonstrate the importance of both the individual Soldier and the unique and indispensable role of the Army in conducting sustained land warfare for the Joint Force. The accomplishments of the Army in these battles and missions have validated the importance of previous investments in modernizing and recapitalizing the force as well as the benefit of inserting the emerging new technologies as found in unmanned aerial vehicle systems (UAVS), friendly or Blue Force Tracking (BFT) systems, precision munitions, and key Soldier systems such as night vision devices and body armor. Preservation of an essential balance between enduring and critical current capabilities and promising new capabilities has never been more important than in the midst of these demanding missions. Carefully maintaining this balance remains an imperative for the Army.

The early lessons of Operations Enduring Freedom and Iraqi Freedom have also highlighted the need for accelerating transformation. On future battlefields against more competent enemies and in more challenging environments, the Army's Future Force—that force which is always evolving over time—must possess even greater responsiveness, deployability, agility, versatility, lethality, survivability and sustainability to

achieve decisive victory. Additionally, the Army must develop a greater capability to operate effectively in joint operations across a wide spectrum of potential missions. True jointness in the future will require not only better interoperability in systems, but also an enhanced ability for full and mutual support among the Services. In recognition of this expanded need for effective jointness, the Joint Staff has recently initiated a new system—the Joint Capabilities Integration and Development System (JCIDS)—to increase oversight of emerging new capabilities and ensure they will support the common operations concepts and provide the necessary operational capabilities. The Army is fully committed to this approach and will work diligently to harmonize the goals and results of internal Army transformation with the requirements of joint operations in the future. One of the Army's two core competencies continues to be providing the most capable land power to the Joint Force and the supported Combatant Commanders, and this involves a commitment to readiness and jointness today and well into the future. In addition, the Army has another core competency to train and equip its Soldiers and grow leaders who will embody a joint and expeditionary mindset and enable the campaign-quality Army, which will remain a vital member of the joint team of forces.

In the Fiscal Year 2005 President's Budget (PB05), the Army is continuing to emphasize its dual commitment to supporting and improving the readiness of the Current Force while ensuring further progress toward a Future Force with even greater capabilities. Momentum achieved in the past several years due to the active and invaluable support from Congress and the Department of Defense (DOD) has been the firm foundation for the progress that has been recently made and presently planned for in the Army's transformation. Specifically, since the *2003 Army Modernization Plan*, the Army has:

- Devoted its highest priority to providing the best support possible for the forces deployed in the global war on terrorism, particularly for those units engaged in Operations Iraqi Freedom and Enduring Freedom; applied lessons learned during ongoing operations to the maximum extent.

- Implemented aggressive equipping initiatives—including diversions, cross-leveling, and accelerated fielding of promising technologies—to provide equipment for Active Component (AC) and Reserve Component (RC) units deployed and engaged in combat operations; key examples included an increased pace and scope of fielding individual body armor, up-armored High Mobility Multi-purpose Wheeled Vehicles (HMMWV), and aviation survivability equipment.

- Initiated efforts for "setting the force" or "reset" by replacing equipment damaged and destroyed in battle and restoring full readiness for Army units to conduct future missions.

- Conducted a thorough review of the assumptions and tenets of Army Transformation and revised plans accordingly in light of the changed operational environment and lessons learned from Operation Iraqi Freedom—with the goal focused on providing a campaign-quality Army with joint and expeditionary capabilities while preserving the greatest support to the Soldier. The result of this review is a synchronized Army plan for the way ahead (Figure 1) that will incorporate the current operational requirements, new initiatives in the areas of force restructuring and modularity, force stabilization, reorganization of prepositioned stocks, optimization and rebalancing of AC and RC units, and

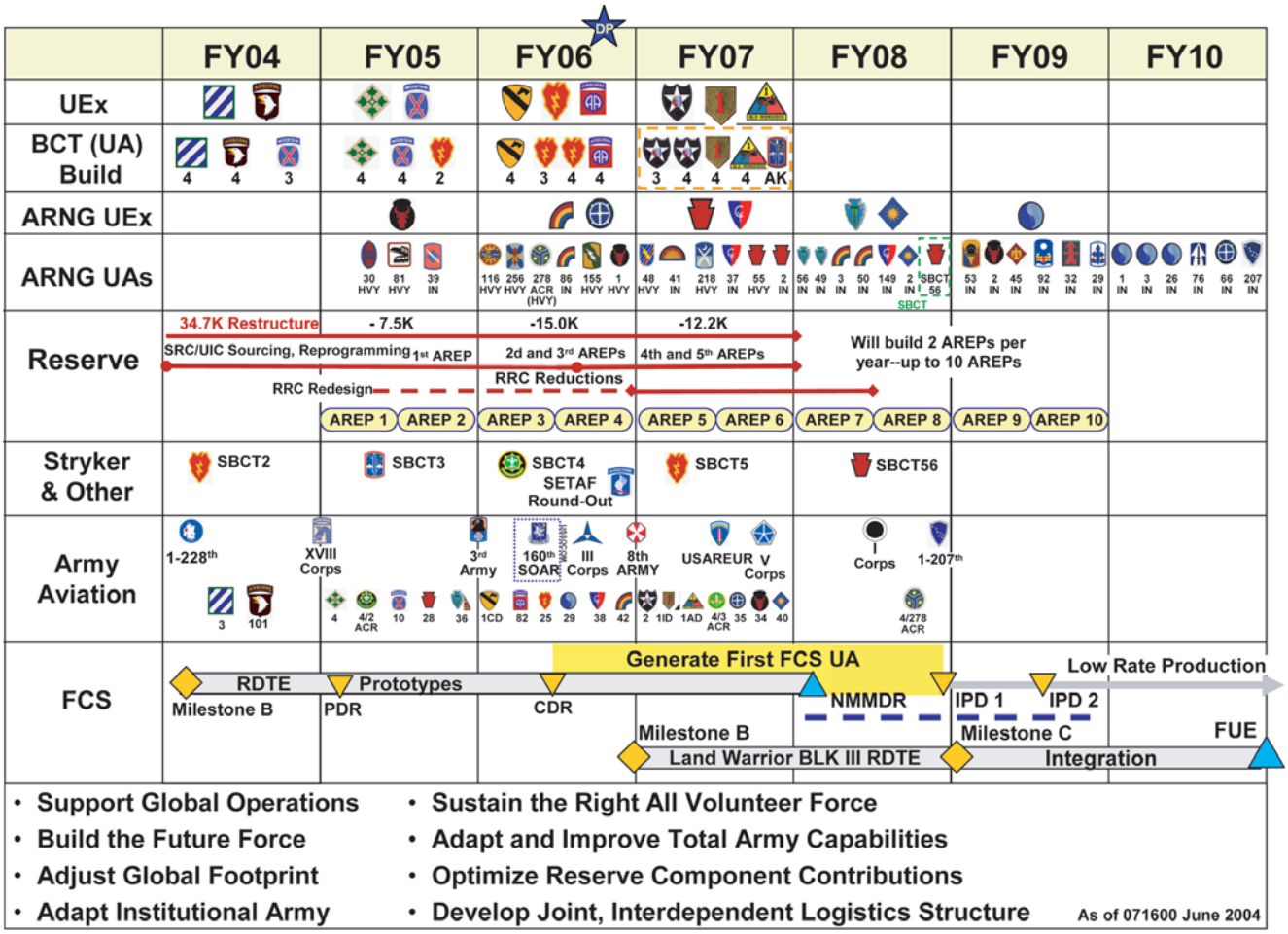

Figure 1. Army Transformation—The Way Ahead

continued support for transformational change. The *2004 Army Modernization Plan* and subsequent years' plans will directly support implementation of this overall direction for the Army's future.

- Initiated a significant organizational restructuring of Army units to create a more modular, flexible and responsive array of balanced formations to meet the near-term and future requirements of the Combatant Commanders. The approved temporary increase of 30,000 in Army manning, along with the initiatives in modularity, force stabilization and rebalancing, will enable a planned increase in AC brigades from 33 to 43, with the potential based on Secretary of Defense (SECDEF) approval to increase to 48 brigades. A corollary reorganization of RC National Guard brigades is likewise planned. See Annex B, Organizations, for further details on these restructuring plans.

- Validated the organization and operational readiness of the first Stryker Brigade Combat Team (SBCT)—the 3rd Brigade, 2nd Infantry Division—in spring and summer 2003, and successfully deployed the brigade to Iraq in fall 2003. It is presently serving as an important Army component in Operation Iraqi Freedom. Accelerated equipping and training the second SBCT—the 1st Brigade, 25th Infantry Division—to permit its operational availability in 2004. Began the transition and fielding of the third SBCT—the 172nd Infantry Brigade—in Alaska using a refined Unit Set Fielding

process to reduce the time the unit is not available. Received SECDEF approval in December 2003 of the Army plan to equip the fifth and sixth SBCTs and incorporate important capability enhancements in those units.

- Accelerated actions to rebalance the mix of AC and RC by moving approximately 10,000 spaces to enhance early deployment capabilities of the active force and realign forces to meet the requirements of ongoing and future joint operations, while also reducing involuntary mobilizations. Further significant rebalancing efforts, involving approximately 100,000 positions, to follow in the future that will improve overall readiness and also reduce the stress on high-demand RC units. Aimed toward both expanding the number of brigades and creating more agile and deployable forces.

- Accelerated the implementation of a force stabilization initiative that incorporates a new manning system and home-basing concept. This will improve unit readiness, cohesiveness, deployability, as well as provide stability and predictability for Soldiers and their families.

- Continued substantial transformation efforts to move toward a Future Force by increased resourcing of the centerpiece of this force—the Future Combat Systems (FCS)—and associated Complementary Systems.

- Received the approval of the Defense Acquisition Board (DAB) in May 2003 to initiate the FCS as a Major Defense Acquisition Program (ACAT 1D), authorizing entrance into the System Development and Demonstration (SDD) phase leading to Preliminary Design Review (PDR) for Increment I, and authorizing execution of a Concept and Technology Development (CTD) contract option for SDD.

- Developed a flexible funding strategy for the FCS Increment I, which has identified requirements and can accommodate future design changes. Contract for $14.8 billion was signed in December 2003 with the Lead Systems Integrator (LSI), Boeing and Science Applications International Corporation, with funds to be used incrementally through FY11 by the FCS industry partners. Initial contracts of $2 billion each were subsequently awarded by the LSI to General Dynamics and United Defense Industries for specific development of the FCS.

- Maintained focus on developing the Army's ability to support the Joint Force Commander in conducting fully interdependent and network-centric warfare. To this end, continued emphasis on fielding key systems essential to the Army's participation in the network—the Warfighter Information Network-Tactical (WIN-T), the Joint Tactical Radio System (JTRS), the Distributed Common Ground System-Army (DCGS-A), and the Aerial Common Sensor (ACS).

Purpose

The purpose of the *2004 Army Modernization Plan* is to effectively and efficiently support the readiness of the Army today as a critical component of the Joint Force and its transformation to deliver future readiness characterized by a force that is responsive, deployable, agile, versatile, lethal, survivable, and sustainable at every point on the spectrum of potential operations. The *2004 Army Modernization Plan*, like previous years' plans, focuses on building combat-capable units to

ensure the Army's continued capability, along with other elements of the joint team, to win our nation's wars and successfully fulfill all missions assigned in defense of our national interests. Along with the *Army Science and Technology Master Plan*, it provides the rationale and justification for the research, development, and acquisition (RDA) portion of the Army's program in support of PB05. Furthermore, it is fully consistent with and supportive of implementing the guidance of the Army leadership, which is reflected separately in *The Army Plan,* the *Army Transformation Roadmap*, which was recently updated and submitted to DOD in November 2003, and the annual *Army Posture Statement*. Specifically, the *2004 Army Modernization Plan*:

- Communicates FY05 budget priorities, key accomplishments and remaining challenges, and shapes conditions for Army budget planning for future years

- Describes the Army's transformation efforts, the progress to date, and how the Army's overall modernization strategy supports both the readiness of the Current Force and transformation initiatives as it continually evolves toward the Future Force

- Describes the future operational environment and the warfighting concepts the Army is expected to use in that environment

- Explains how Army readiness and transformation initiatives are supported by modernization efforts across the entire breadth of Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF)

- Describes the Army's modernization and investment strategies

- Provides information on selected programs that are critical to the Army's efforts to enhance capabilities of the Current Force and continually transform to improved Future Force capabilities

The *2004 Army Modernization Plan* does not offer the following:

- Specific details on all RDA programs. This information is provided in other documents, to include the *U.S. Army 2004 Weapon Systems Handbook*.

- Specific commitment for budget figures beyond FY05. Any information reflected for these years represents an Army planning estimate and is subject to change.

- Modernization schedules for specific units that are published and disseminated separately

Current Operational Environment: An Army at War

The Army's prior decision to transform itself into a more responsive and capable force was the result of an appreciation of an altered and rapidly changing strategic environment. The end of the Cold War had already rearranged the broad shape of the requirements facing the U.S. military, and subsequent trends and events reinforced the need for substantive change. This new environment also included the realization of a revolution in information technology that presented both an imperative as well as an opportunity to adapt organizations and equipment to meet the challenges of the 21st century. While this need for change was acknowledged in recent years, the dramatic events that occurred in late 2001 and in subsequent military operations have vividly reinforced the nature of the new strategic environment and the associated urgency for

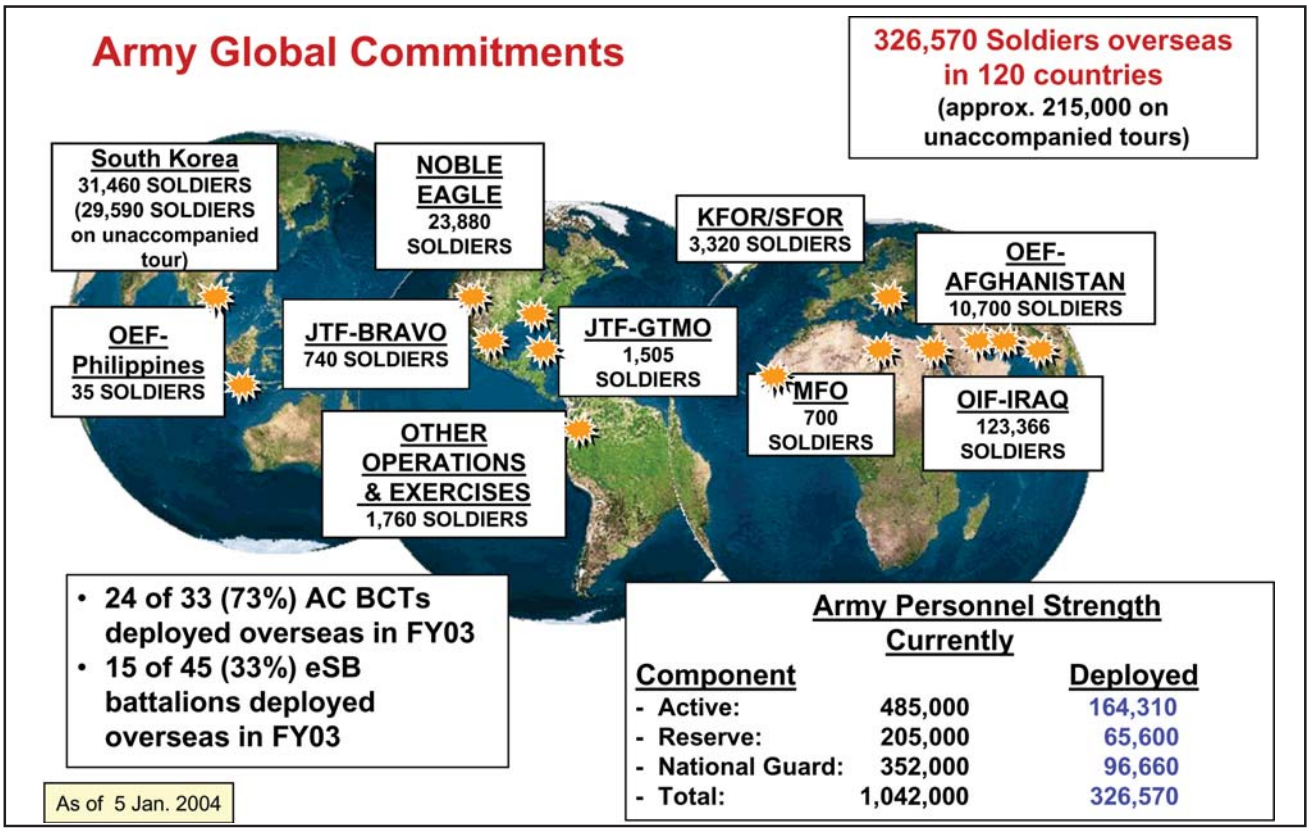

Figure 2. Army Global Commitments

effective and innovative responses now and in the future. The global war on terrorism, which has been fought globally by U.S. and allied forces, is a current reality as well as a future challenge for the Army and other members of the joint team. The nation and its military forces are indeed at war and engaged in a demanding and vitally important endeavor. This environmental reality influences all Army efforts regarding preservation of essential readiness for the Current Force and transformation toward the Future Force.

Operations Enduring Freedom and Iraqi Freedom have been major undertakings by the United States and have involved a significant commitment of Army forces as part of the joint operations conducted by the regional Combatant Commanders. Supporting these missions and the overall global war on terrorism remains the highest priority for the Army. This mission is also consistent with the priority for security of the United States as the primary enduring mission for the U.S. military as a whole. Waging the global war on terrorism encompasses efforts overseas as well as at home, and it involves use of all Army components—AC and RC—as well as the essential civilian elements of the Army structure.

Considerable lessons have already been learned in both Operation Enduring Freedom and especially in Operation Iraqi Freedom, which remains a major commitment for Army forces for the immediate future. These operations demonstrate the critical importance of effective joint operations and the value of highly trained and balanced forces. In both operations, the Army's Special Operations Forces—to include Rangers, Special Forces, Special Operations Aviation, Psychological Operations, and Civil Affairs units—played a major role in effectively fusing their unique capabilities with those of joint conventional

forces. In addition, the array of conventional Army forces including the potent 3rd Infantry Division, which dramatically seized Baghdad; the 101st Airborne Division, with its unique air assault capabilities; the responsive capabilities of the 173rd Airborne Brigade; and the varied and indispensable capabilities of a brigade of elements of the 82nd Airborne Division, along with units of the V Corps, all combined to form key elements of the Joint Force in Iraq in March-April 2003. Since the conclusion of major combat operations (MCOs), the 4th Infantry Division, the 1st Armored Division, the 3rd Armored Cavalry Regiment, and the 2nd Cavalry Regiment have also played significant roles in ongoing and very demanding stability operations, which often include characteristics and costs associated with MCOs. Subsequently, other elements of AC and RC combat units have assumed important roles in the long-term stabilization and success of the mission. Overall, balanced Army forces with an assortment of capabilities teamed with the 1st Marine Expeditionary Force and 1st Marine Division, the British 1st Armoured Division, and other coalition forces to form the critical land power component of the combined and joint forces in Iraq. It is essential that the lessons learned from this operation be applied as soon and as widely as possible within the Current Force to make the Army and the joint team even more effective.

Future Operational Environment

In addition to the immediate demands and lessons from the current operational environment, the next two decades present a perplexing array of security challenges for the United States. Expanding webs of economic and information architectures will allow some regional powers to compete on a broader scale and emerge on the global landscape with considerable influence. In addition, regional power structures are likely to change as regional conflicts, civil wars and transnational actors reshape existing paradigms. New global actors may emerge on the world scene. Many emerging powers perceive the United States as trying to achieve global dominance and may form alliances in an attempt to limit U.S. global influence. Demographics (high population growth, and cultural, ethnic and religious factors, coupled with increased migrations, will cause potential unrest and increased pressure for scarce resources), economics (increasing globalization and the spread of transnational business), and technology (widely available advanced systems that are very user friendly) will enhance the capabilities of developed and developing states alike and may alter power relationships within regions and create an intensified globalization process. This globalization will demand international interaction on a wide range of issues to decrease the possibility of conflict. It can also be said with reasonable certainty that during this period, state or non-state actors will employ or threaten violent force as a means to pursue their interests. That violence will not be limited to U.S. interests or facilities abroad, but as September 11 has demonstrated, may also occur in the United States.

The causes for future conflict and the critical variables in the operational environment are shown in Figure 3.

The military strategic and operational setting out to 2020 will become increasingly global, encompassing land, sea, air, space and the cyber dimension and will be fought by joint and combined forces within a worldwide context utilizing a network-centric joint command, control, communications, computers (C4) and intelligence, surveillance, and reconnaissance (ISR) architecture. It will be fluid and multifaceted, ranging from peacetime military

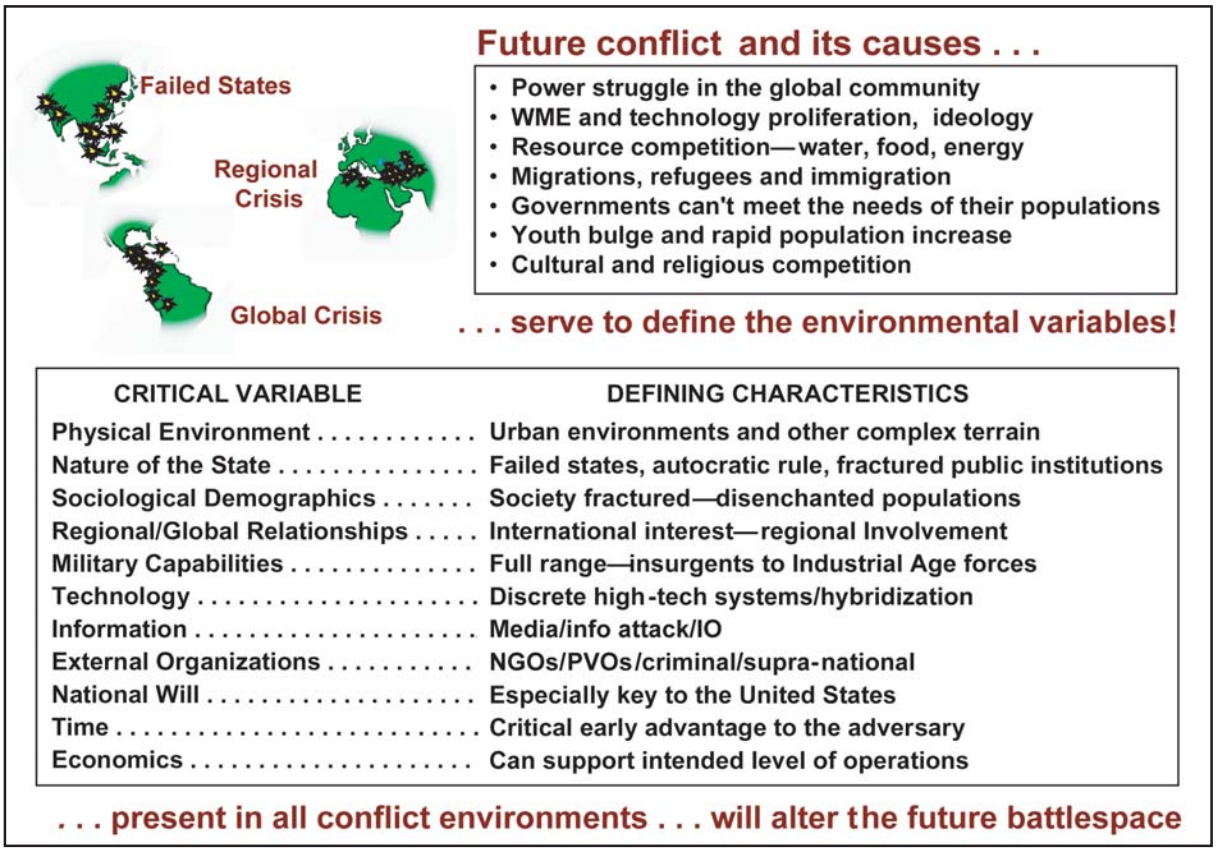

Figure 3. Operational Environmental Variables

engagement to major contingency operations. These operations present differing dangers for U.S. Armed Forces ranging from isolated attacks upon Soldiers to operations that involve the mobilization of every capability available to a potential foe fighting a total war. Future campaigns against the United States will include a balance of asymmetric, adaptive and conventional operations executed over a time frame that allows potential enemies to conduct a campaign to take advantage of potential U.S. strategic vulnerabilities, such as the requirement to rapidly deploy forces to conflict areas.

The United States, at present, is able to eventually dominate any military force it will encounter in the various regions of the world, though we must also be able to deploy to those regions where potential enemy forces may be present. Some adversaries conclude that they can conduct operations below a threshold that would elicit a U.S. military response; others realize that they must attempt to keep the United States from deploying to their regions. To accomplish this goal, several adversaries will use all means possible—military, political, economic, information and even terrorist attacks on the United States or allies' homelands—to pressure the United States and its allies from ever deploying forces to intervene in conflict regions. Indeed, the threat of terrorist attacks on the U.S. homeland is increasing, underscoring the fact that there are no sanctuaries. If potential adversaries are unable to preclude U.S. or allied intervention, they will try to exclude our forces from entry by denying or striking the airbases or seaports our forces will need to conduct and sustain their operations. These adversaries are also likely to employ cruise and ballistic missiles, aircraft and UAVS, special purpose forces and terrorists. Additionally, enemies will employ information operations to degrade our

command and control and lessen our ability to conduct rapid, decisive operations. If U.S. and allied forces are able to deploy, they will attempt to limit or stop the flow of U.S. assets and support into an area. If the United States is successful in deploying forces to an area, the enemy will use all of the operational environment factors to influence the conduct of operations. Additionally, they will employ any niche technology enhancement in weapons they have been able to acquire and integrate into their forces to increase their own capability. Finally, adaptive, learning forces will operate from dispersed and decentralized positions, and use extensive cover, concealment, camouflage, denial and deception to complicate U.S. advantages in targeting and long-range standoff weapons delivery. The goal of these operations is to create opportunities for their forces to prolong the conflict, cause the United States a greater number of casualties, and create conditions to end the conflict under conditions favorable to themselves. Examples of these activities are those being used today against U.S. and coalition forces in Afghanistan and Iraq.

Given creative and adaptive adversaries, the Army's Future Force must be capable of effective, proactive responses against both modernized, conventional and unconventional forces, as well as capabilities employed asymmetrically. Historical success will not necessarily be a reliable indicator of successful future military operations, as potential adversaries develop ways of countering U.S. intervention.

The challenge ahead is the ability of the U.S. Armed Forces in general and the Army in particular to maintain decisive superiority while developing strategies, doctrine, organizations, and systems to defeat adaptive adversaries. Army forces must retain a quality of adaptive dominance–the ability to dominate any situation regardless of how an adversary reacts. This adaptive quality will require a Future Force with inherent versatility and adaptive Soldiers and

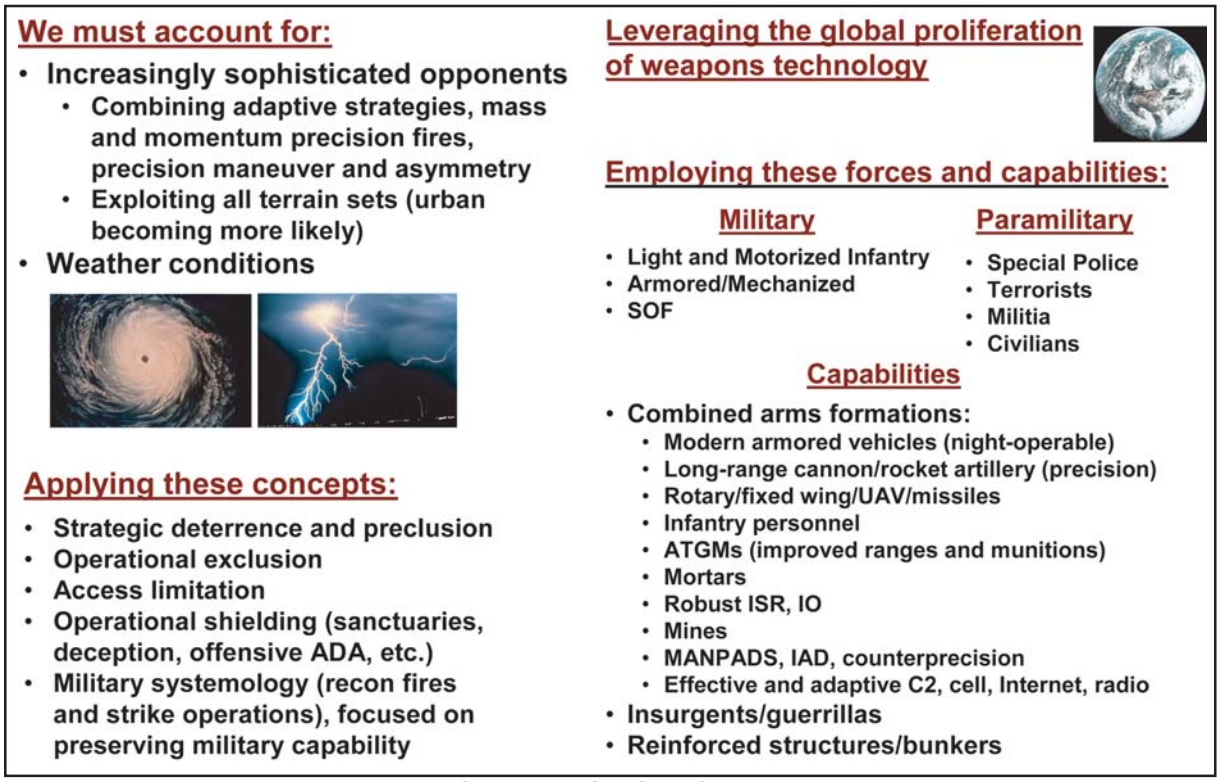

Figure 4. Adaptive Threats

leaders who can account for the critical variables inherent in the future operational environment. The primary challenge for the Army in dealing with adaptive threats is summarized in Figure 4.

National Security and Defense Strategies

The events of September 11, 2001 vividly demonstrated that the world had entered a new era of conflict with new challenges. The challenges of the new era are no longer confined to hostile nation states equipped with traditional militaries. Although traditional challenges will remain, the United States is threatened more by failing states than by strong states. We will face persistent and future threats from non-state actors and rogue states that will employ irregular, catastrophic and disruptive methods to challenge us.

In September 2002, the White House published a new National Security Strategy (NSS) to serve as the foundation for future U.S. actions and responses in meeting these new challenges. The NSS states that the United States will seek to "make the world not just safer but better" by spreading political and economic freedom, maintaining peaceful relations with other states, and promoting respect for human dignity. It also outlines a preventive strategy for ensuring the safety of the American people.

In response to the President's guidance, DOD has developed a Defense Strategy (due to be updated in early 2004), which supports the goals stated in the NSS. The strategy seeks to extend U.S. influence and prosperity and preserve the nation's security by building a durable framework in which the United States and our allies can prosper in freedom. To this end, the 2001 Quadrennial Defense Review (QDR) outlined four Defense Policy Goals—the **ends** of the strategy are:

- Assuring allies and friends
- Dissuading future and military competition
- Deterring threats and coercion against U.S. interests
- If deterrence fails, decisively defeating any adversary

The QDR identified seven interdependent Strategic Tenets, which support the Defense Policy Goals. The Joint Operations Concepts (JOpsC) defines how the military will fight as a Joint Force to achieve those goals. The combination of the JOpsC and the Strategic Tenets provides the **ways** through which the military will assure, dissuade, deter, and defeat persistent and future challenges. The seven Strategic Tenets are:

- Manage risk in four areas—force management, operational, future and institutional
- Adopt a capabilities-based approach
- Defend the United States and project U.S. military power
- Strengthen alliances and partnerships
- Maintaining favorable regional balances
- Develop and maintain a broad portfolio of military capabilities
- Transform America's defense

The military **means** with which the strategy will be executed is the Joint Force. The Joint Force must be adaptable, fully integrated and networked with other instruments of national power. It must be decentralized, expeditionary, and lethal and must possess decision

superiority in order to confront the persistent and future challenges of the new era. The Joint Force must consist of an appropriate mix of capabilities and quality people. The force-sizing construct in the 2001 QDR specifically shapes and sizes the **means** of the Defense Strategy. The Joint Force must possess the capabilities and be sized to:

- Defend the United States
- Deter aggression and coercion forward in critical regions
- Swiftly defeat aggression in overlapping major conflicts while preserving for the President the option to call for a decisive victory in one of those conflicts—including the possibility of regime change or occupation
- Conduct a limited number of small-scale contingency operations

As a capabilities provider to the Joint Force, the Army already has in motion a comprehensive plan to achieve the **ends** of the strategy by transforming itself in a manner consistent with the **ways** to provide relevant and ready **means** that are joint, expeditionary and possess campaign qualities. Through the continuous support and upgrade of the Current Force as well as the development of the evolving Future Force, the Army will provide significant support to accomplishing the **ends** of the strategy by preserving key existing capabilities, such as that for forced-entry and tactical assault, and adding major improvements that will capitalize on new technologies to enhance the overall effectiveness of the force, today and in the future.

DOD Transformation Planning Guidance

In April 2003, the SECDEF approved specific guidelines for the DOD to follow in its efforts to achieve transformational capabilities in support of emerging joint concepts to execute the broader National Security and Defense Strategies. The desired outcome was identified as "fundamentally joint, network-centric, distributed forces capable of rapid decision superiority and massed effects across the battlespace." Transformation is described as "a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organizations that exploit our nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic position, which helps underpin peace and stability in the world." The Army is committed to fulfilling this guidance in its transformational efforts now underway.

The DOD strategy for implementing transformation consists of three parts: transforming the culture of innovative leadership; transforming the processes for capabilities identification and for strategic analysis; and transforming capabilities for force transformation. Force transformation itself, which is the major challenge for the Services, is defined as resting on the following pillars:

- Strengthening joint operations
- Exploiting U.S. intelligence advantages
- Experimenting in support of new warfighting concepts
- Developing transformational capabilities

This strategy involves two major dilemmas that must be addressed by the Army in its

transformation efforts—the need to balance near-term operational risks against future risks and the need to invest now in specific transformational technologies while remaining open to other paths to change in the future. The requirement for this careful balancing means that the Army must continually reassess its plans and programs in light of both the changing strategic environment and the technological opportunities that will continue to evolve over time. Our transformation efforts must retain the best of current capabilities and take advantage of emerging transformational opportunities to modernize and improve the Current Force while developing more revolutionary initiatives for the Future Force.

Army Transformation Roadmap and Campaign Plan

As noted earlier, DOD published updated guidance to the Services in April 2003 regarding their transformation efforts. This *Transformation Planning Guidance* reiterated goals as well as a process to assist with and to measure overall success. In November 2003, the Army released its first annual update to the *Army Transformation Roadmap,* which was initially published in June 2002. The *Transformation Roadmap* reports how Army Transformation supports and is congruent with Defense Transformation through the Future Years Defense Plan (FYDP). It demonstrates how the Army is providing those capabilities required by the Joint Force Commander (JFC) to execute the emerging operating concepts that guide future joint operations. Furthermore, it is an integral part of *The Army Plan* (TAP), which is the primary internal programming guidance in developing and funding capabilities that the Army provides the Joint Force. The *Army Transformation Roadmap* also serves as the means of providing overall direction for Army-wide efforts, which are laid out in greater detail in the *Army Campaign Plan*, the primary synchronization instrument for the Army as well as a means for ensuring effective coordination with joint and DOD efforts. The *Army Campaign Plan* is a living document that is modified in light of changing needs. In this regard, a new campaign plan was recently published in March 2004 that includes overall coordination of the latest Army transformational efforts in the areas of modularity and restructuring, force stabilization, reorganization of prepositioned stocks, AC and RC force rebalancing, as well as other ongoing initiatives. The content of the *2004 Army Modernization Plan* is consistent with the *Army Transformation Roadmap,* since both documents are based on the same overall policy guidance and budget planning process for the Army contained in the TAP.

Army Capabilities and Joint Operating Concepts

Within the expected future operational environment and in support of the nation's National Security and Defense Strategies, the Army remains the primary provider of sustained land power forces to the JFC. The vast majority of missions will be joint in nature, and the full array of Army forces—from highly valuable Special Operations Forces (SOF) to the wide variety of conventional forces—will be structured and equipped to participate in such joint operations. Moreover, in those missions requiring overseas deployments, the Army relies on its sister Services for the critical strategic lift, both air and sea, to get to the theater in a timely manner. Close cooperation among the Services to produce joint interoperability and deployability, coupled with a dynamic program of training and experimentation in peacetime, will be indispensable to achieving the level of joint support essential to success in all missions. In effect, all Services are now progressing from the need for interoperability to a broader

requirement for real interdependence. Additionally, where possible, cooperative programs with other Services and in a joint framework will be fully supported. In this regard, the Army and U.S. Marine Corps established in October 2003 the Army Marine Corps Board with the goal of meeting periodically to identify and resolve issues related to respective capabilities and programs and the potential for cooperative efforts. Depending on the subject matter, other Services will also be included in this process to address areas of mutual interest.

In addition to the imperative for successful joint cooperation and support, the Army also recognizes that many, if not most, future missions will also be characterized by interagency and multinational cooperation. Multinational arrangements have been a defining nature of most major military operations in the recent past, from Operation Desert Storm to the Balkan missions to Operation Enduring Freedom in Afghanistan and most recently Operation Iraqi Freedom. The likelihood is for this trend to continue in the future. As a result, the Army views effective international cooperation as an important element in making Army transformation efforts successful in both process and eventual application on future battlefields. Such cooperation will focus on two key and complementary components—multinational force compatibility or interoperability, and security cooperation.

Returning to the DOD transformation goal of developing capabilities for application by the Joint Force, the new JCIDS methodology (Figure 5) validates the joint capability requirements that emerge from the JOpsC,

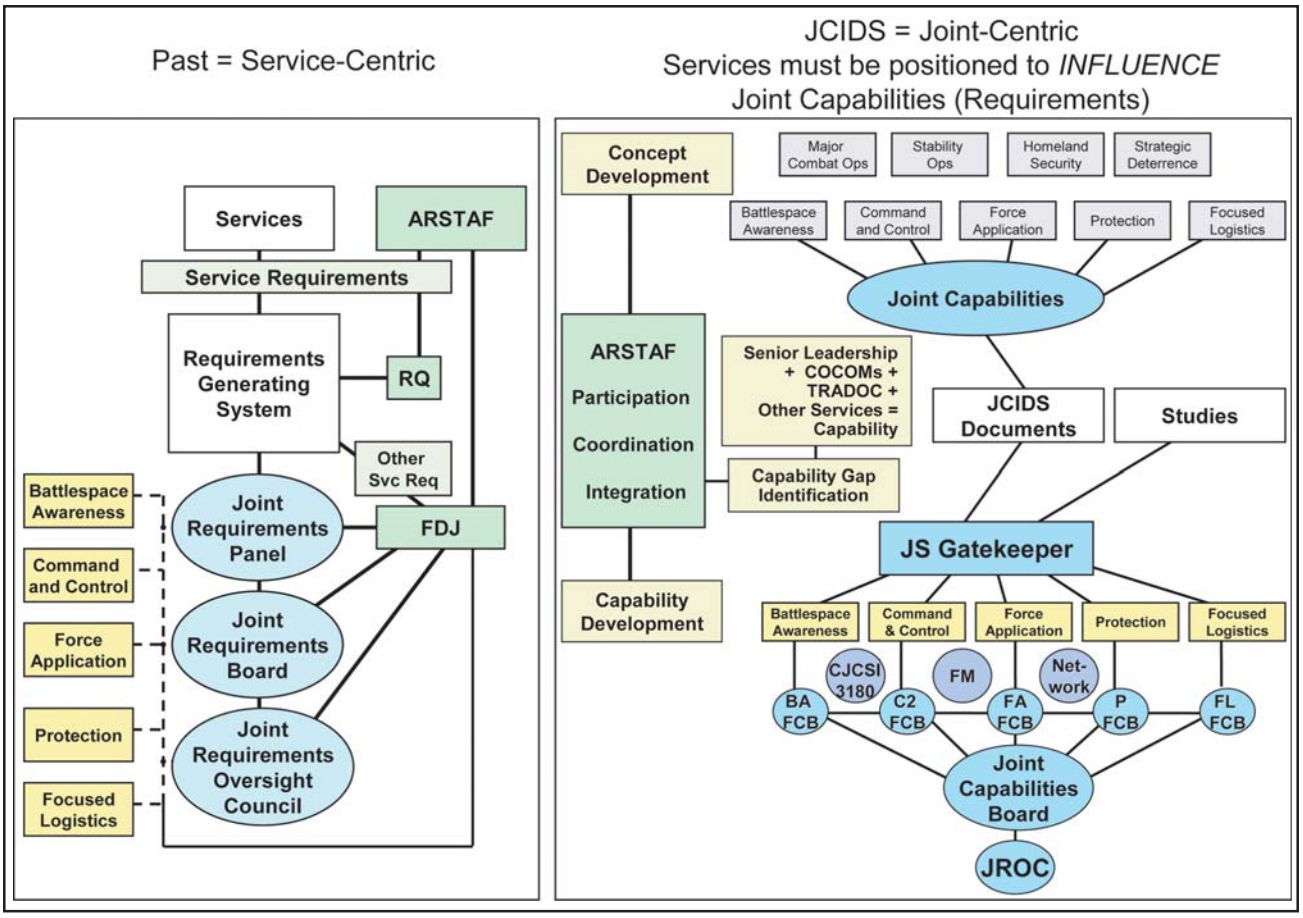

Figure 5. Joint Capabilities Integration and Development System (JCIDS) Process

which will serve as the link between how joint forces operate today and how they will operate in the future. It provides the operational context for transformation by linking strategic guidance with the integrated application of Joint Force capabilities. The JOpsC provides a unifying framework for developing Service concepts and subordinate joint operating concepts, joint functional concepts, and enabling concepts. Army concepts are inherently joint in nature and are nested with the JOpsC. In this regard, the Army's overall Capstone Concept describes Army Future Force operations and provides the central focus for the Army's supporting operating, functional and enabling concepts.

These supporting Army concepts will be nested in a coherently joint context that includes the following five key joint and expeditionary interdependencies:

- Joint Battle Command—interdependent command and control driven by top-down, comprehensive architectures and redundant, interoperable networks; will enable effective joint fires, blue force tracking, and logistic support for effective anticipation and reaction in an expeditionary context.

- Joint Fires—the interdependence of joint fires will be vital to mitigating risk and reducing reliance on organic fires in a joint and expeditionary environment; effective implementation requires cooperative adjustments by all Services.

- Joint Lift—the Army's dependence on its sister Services is nowhere more obvious than in the area of mobility, both strategic and operational; the solution to the Army's mobility challenges will require action by both the Army, in terms of improved deployability, and our other Service partners, in recognition of the importance of this critical competence.

- Joint Air and Missile Defense—the increasing range and speed of air and missile threats, and their potential ability to deliver weapons of mass destruction, place a high premium on the interdependence of Service air and missile defenses, regardless of their domain of origin; has driven considerable integration of programs and requirements.

- Joint Logistics—all Services have key interdependencies in the logistics arena and will experience even more in an expeditionary environment; a pressing demand for a joint end-to-end logistics structure that permits reliable sustainment of distributed operations in which deployment, employment, and sustainment are simultaneous.

The JOpsC builds upon the goal of full-spectrum dominance across the range of military operations and is based on the ability to sense, understand, decide and act faster than an enemy in any situation. To succeed in an uncertain future security and operational environment, the JOpsC places emphasis on a capabilities-based and adaptable force to balance capabilities and manage risk. In addition, the JOpsC identifies seven future joint force attributes—fully integrated, expeditionary, networked, decentralized, adaptable, decision superior, and lethal. The Army's intent is to embed these attributes as much as possible in the Current Force, while accelerating development of new technologies and their incorporation in the evolving Future Force.

To succeed in achieving this goal of full-spectrum dominance, the Joint Force must adopt a more joint and expeditionary mindset. That is also the goal of the Army as

transformation efforts continue that are devoted to moving progressively from an improved Current Force to a more capable Future Force. The Army will seek to achieve these future attributes by developing more modular organizations and institutionalizing the joint and expeditionary mindset within those organizations. Additionally, an effort will be made to accelerate the development of new capabilities for the Future Force and simultaneously insert some of these new capabilities into the Current Force.

Within the JOpsC, four joint operating concepts are identified to further guide the development and integration of joint functional and Service concepts to provide joint capabilities. These four operating concepts are: Homeland Security, Strategic Deterrence, Major Combat Operations, and Stability Operations. For the Joint Force to operate in a simultaneous and distributed manner and accomplish its missions with these operating concepts, it requires certain functions, called functional concepts. These joint functional concepts describe how a future JFC will integrate a set of military tasks to attain the capabilities needed across the range of military operations. Following are the joint functional capabilities that will guide both joint and Army efforts to develop and field capabilities for the future:

- Force Application
- Protection
- Focused Logistics
- Battlespace Awareness
- Command and Control

The Army's materiel development efforts will be tied to this overall process and goals for fielding the Joint Force with its required and integrated capabilities. Annex D, Materiel, to the *2004 Army Modernization Plan* categorizes key materiel development efforts in terms of the above functional capabilities.

Army Focus Areas

To augment and further refine the Army's internal plans and ongoing actions in light of the operational environment and exigencies of the ongoing war, the Army leadership in late 2003 initiated an extensive review of a wide variety of focus areas (Figure 6 on the following page). Overall, the introspective examination along these functional lines aims at examining Army efforts and making necessary adjustments as required to improve the support for the Joint Force today and into the future. In conjunction with the Army's participation in the JCIDS process to provide needed capabilities to the Joint Force, this comprehensive internal review serves to inform current and future policy and budgetary decisions. While some of the initial results of this process led to minor modifications in the Army's component of PB05, more extensive modifications are expected to occur in the FY06-11 planning process currently underway.

Army Focus Areas

- **The Soldier**—Develop flexible, adaptive and competent Soldiers with a Warrior Ethos.
- **The Bench**—Prepare future generations of senior leaders. Identify and prepare select Army leaders for key positions within joint, interagency, multinational and Service organizations.
- **Combat Training Centers/Battle Command Training Program**—Focus training at CTC and BCTP to meet requirements of current security context, and joint and expeditionary team.
- **Leader Development and Education**—Train and educate Army members of the joint team.
- **Army Aviation**—Conduct a holistic review of Army Aviation and its role on the Joint battlefield.
- **Current to Future Force**—Accelerate fielding of select Future Force capabilities to enhance effectiveness of Current Force. Army transformation is part of constant change.
- **The Network**—Leverage and enable interdependent, network-centric warfare.
- **Modularity**—Create modular, capabilities-based unit designs.
- **Joint and Expeditionary Mindset**—Retain our campaign qualities while developing a joint and expeditionary mindset.
- **Active Component/Reserve Component Balance**—Redesign the force to optimize the Active and Reserve Component (AC/RC) mix across the Defense Strategy.
- **Force Stabilization**—Ensure unit stability and continuity, and provide predictability to Soldiers and their families.
- **Actionable Intelligence**—Provide situational understanding to commanders and Soldiers with the speed, accuracy and confidence to impact current and future operations.
- **Installations as Flagships**—Enhance installations' ability to project power and support families.
- **Logistics**—Develop an Army logistics structure that is responsive to the needs of a joint and expeditionary campaign-quality Army while eliminating redundancy and streamline support by reducing unnecessary layers.
- **Authorities, Responsibilities, and Accountability**—Clarify roles and enable agile decision making.
- **Resource Processes**—Redesign resource processes to be flexible, responsive and timely.
- **Strategic Communications**—Tell the Army story so that the Army's relevance and direction are clearly understood and supported.

Figure 6. Army Focus Areas

Army Transformation

Accomplishments, Continuing Progress, and Refinement

In recent years, the Army has built upon its vision for a future Army that is more capable of rapid strategic response and tactical dominance across the full spectrum of military operations. The primary instrument for accomplishing this goal was a dramatic process of change—Army Transformation—that aimed at making a great Army even better and more relevant in its capability to serve as an essential element of the overall Joint Force. Along with Army Transformation, two other critical components made up the substance of the Army's vision for the future—Readiness and People. Readiness was identified as the Army's top priority for near-term responsibilities to the nation, with People highlighted as being at the centerpiece of the Army and its critical link to the nation. This entire effort has always been linked to the overall responsibility of the Army to serve the nation and its interests as part of a Joint Force comprised of all military Services.

The Army has made great progress thus far in its transformation efforts and has established momentum on a path to a Future Force possessing new and improved capabilities. Significant investments have been made to explore and develop revolutionary capabilities to provide our Soldiers and units. Some new capabilities have already been fielded to units in the Current Force, including those capabilities resident in the new SBCTs that are being formed. Further development of additional and more significant capabilities is well underway with the progress made in the evolution of the FCS. Progress is by no means limited to new equipment, and efforts continue across the full range of DOTMLPF to realize new capabilities that will support the emerging Joint Force attributes and concepts needed to implement National Security and Defense Strategies. It is the effective integration of all of these areas that will ultimately place Soldiers and leaders into combat-capable units that can fulfill the entire array of missions in the new security environment.

The evolving Army transformation process (Figure 7) is continuous and dynamic and builds on a long history of adaptation and change in the U.S. Army. It encompasses all aspects of the Army, including both the Current Force today and the ever-evolving Future Force. The security environment within which this process occurs is shaped by external challenges, national strategic and defense guidance, and evolving joint concepts. These environmental factors have all been undergoing considerable change in recent months due to the demands of the ongoing global war on terrorism, including operations in Iraq, and the emerging refinement of joint operations concepts and the system for producing joint integrated capabilities. By far the most important factor has been the dramatic change in the strategic environment posed by the operational challenges associated with the global war on terrorism. The demands for readiness of the Army to meet current requirements in this ongoing war have taken on an increased and higher priority in light of the risks to the nation and our Soldiers; thus the Army's transformation plans must be and have been adapted to rebalance the associated strategy and implementing efforts. The ongoing examination of immediate focus areas has been an important means in this rebalancing effort. People—primarily our Soldiers, but also their families and associated

civilian and contractor support personnel—still remain as the centerpiece of the Army, current and future. Yet, transformation of an Army at war must continue to accomplish the range of missions assigned in the Defense Strategy and to devote adequate resources to the Future Force to maintain a military advantage against future threats.

simultaneously developing the new technologies that will be the foundation of revolutionary change. In the midterm, the Army will complete the fielding of the SBCTs and the selected and limited modernization of the Current Force, and begin fielding of Future Force units. In the long term, the Army will continue transforming into the Future Force, while still seeking leap-ahead improvements

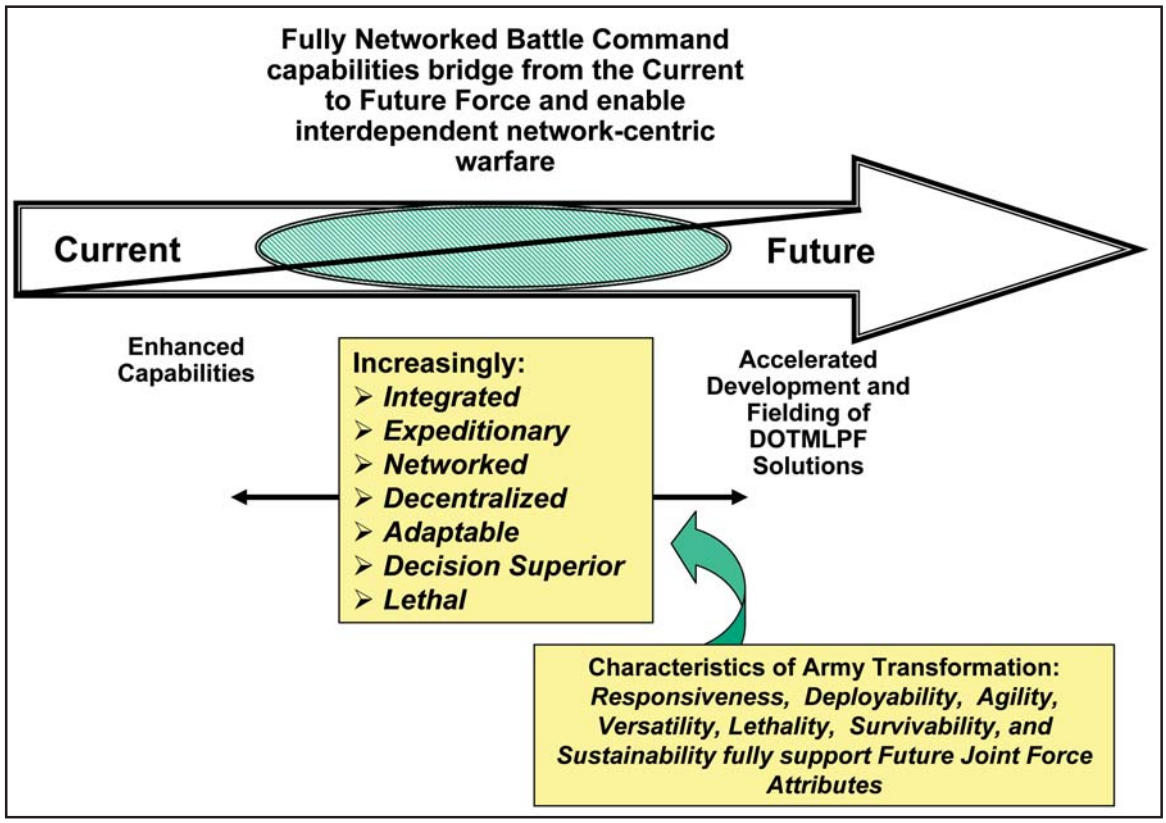

Figure 7. Evolving Army Transformation

Transformation Timelines—Building Combat Power Over Time

The Army is taking a phased approach to developing and fielding capabilities over time. In the near term, the focus is on maintaining and improving the Current Force through recapitalization of some existing systems and the incorporation of new technology to create a common operational picture (COP), and designing the Future Force while

in future capabilities as opportunities arise. Transformation is a continuum of changes and improvements that seek to maintain clear military superiority in the face of future needs and technological developments.

The Current Force—Capabilities for the Joint Force Today

In implementing its transformation efforts, the Army is focused on continuously incorporating

capabilities in both its operational and institutional elements. The Current Force is the operational Army today and has the mission of providing needed land power capabilities to the JFC for use across the full range of military operations. It is the Current Force that is carrying out vital missions in Iraq and Afghanistan and other key locations around the world. It is this force that must be ready and able to respond to orders by the President and the SECDEF and support Combatant Commanders as part of the Joint Force. As such, it is imperative that the Army continue to devote those resources necessary to support and equip the Soldiers in today's Army to ensure their success and safety in all possible missions. To do this, the Army will work to maintain existing capabilities, enhance them where feasible within emerging technologies and available resources, and significantly expand capabilities where possible in selected areas in the near term. The Current Force will continue to serve as the basis for strategic insurance throughout the Army transformation process over time, and its readiness must and will be preserved.

Figure 8. Current Force in Action in Iraq

Maintaining and Extending Readiness and Setting the Force

Modernization and recapitalization of the current Army force—the Current Force—is at the heart of addressing readiness. Army transformation timelines clearly show elements of the Current Force remaining within the Army's force structure for the next 25-30 years. Within that context, the Army will continue to rely upon the Current Force to fight and win conflicts well into the fielding of the Future Force, which will begin by the end of this decade. For that reason, sufficient resources must be devoted toward the recapitalization and limited modernization of the Current Force while the Army successfully transforms itself. The Army will direct to the Current Force the resources needed to maintain combat superiority and rapid strategic power projection and to insert new technologies that improve the quality of the force and its contribution to the joint team.

The Army previously recognized the reality of resource constraints and accepted some limitations and associated risks in the Current Force to allow the investment required for the Future Force. These limitations, however, must be continually reviewed to ensure that current readiness requirements are always met, especially in light of critical and often unexpected needs that arise such as the ongoing global war on terrorism and other contingency operations. Due to the demands of the operational requirements today, accepting further risk in the Current Force is no longer acceptable. As part of maintaining warfighting readiness today, the Army is executing a detailed and

comprehensive reset effort for "setting the force," designed to return the forces that fought in overseas operations to prehostility readiness standards. This program is designed to rapidly reconstitute the Army's Current Force to be prepared for other contingencies.

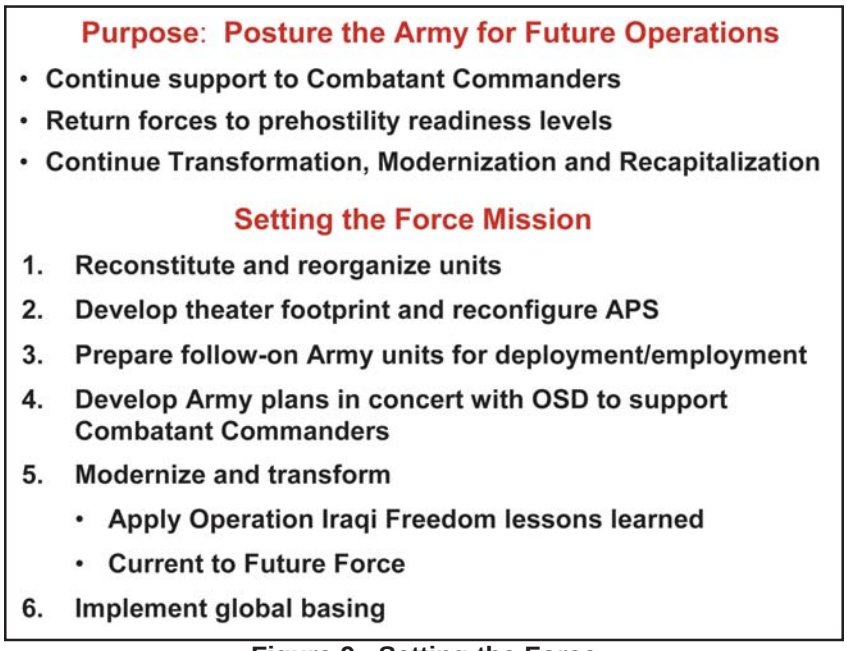

Figure 9. Setting the Force

An important element of the Current Force is the requirement for an offensive or counteroffensive capability for use in a major conflict. To meet this need, the Army is selectively modernizing and recapitalizing portions of III Corps including the 3rd Armored Cavalry Regiment and two active duty heavy divisions, the 1st Cavalry Division and the 4th Infantry Division. Also included are those echelons above division (EAD) units assigned to III Corps, including RC units. In addition, the Army will also selectively modernize and recapitalize units undergoing reset.

The insertion of new information technologies and better knowledge management systems will provide Current Force organizations the warfighting capability to see the battlefield, anticipate requirements and handle transitions that will characterize the Future Force. Therefore, with the upgrade of the Current Force, the Army's overall modernization strategy begins to develop future leaders who can employ the Future Force in ways that maximize its potential.

The forward-deployed and early-deploying contingency forces will be recapitalized and modernized with the insertion of new technologies as needed to implement the National Security and Defense Strategies. Reserve Component forces will maintain capabilities compatible with the units they support through the selective cascading of equipment from the AC. Limitations in the Current Force recapitalization and modernization effort, resulting from difficult decisions made to fully fund Future Force and Stryker programs, may delay the modernization of the RC forces that rely on cascading. This delay, however, is a necessary risk required to meet the Army's objective of a future transformed force and to support overall DOD transformation goals while still preserving and upgrading the readiness of the Current Force.

New Capabilities for the Current Force—Stryker Brigade Combat Teams

Fielding the Stryker-equipped brigades within a new organizational design fills a strategic near-term operational requirement for current Army forces. It leverages today's state-of-the-art technologies to bridge the capabilities gap between today's force and the arrival of the Future Force and provides more flexible options for the regional Combatant

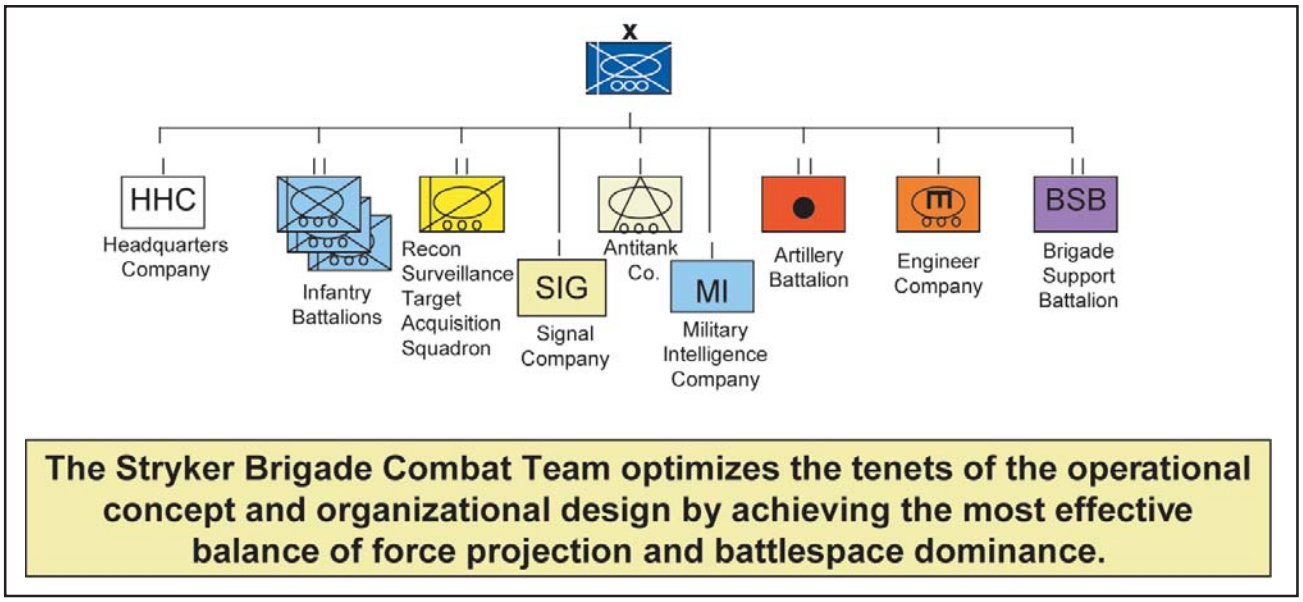

Figure 10. SBCT Organizational Design

Commanders. Stryker-equipped brigades are designed to be operationally effective at both the low end of the spectrum—peacekeeping, security-building, and small-scale contingencies (SSCs)—as well as at the high end of the spectrum—major combat operations (MCOs). They are optimized for close combat to destroy enemy forces in their sanctuaries. They will also serve as an indispensable vanguard for the Future Force by validating operational and organizational concepts, training and leader development initiatives, and deployment scenarios.

The Army is fielding truly network-centric units in the form of SBCTs. Unlike other brigade combat teams in the Current Force, the design of the SBCT features organic combined arms formations down to company level as well as the assignment of core capabilities that previously resided at higher levels. These assigned forces and capabilities include signal; ISR (to include UAVS); remote ground sensors; nuclear, biological and chemical (NBC) reconnaissance; artillery; and combat engineers.

The Army has fully funded plans to field six SBCTs to contribute to fulfilling the Defense Strategy and our national security requirements. In December 2003, the SECDEF approved an Army plan for further enhancements to the fifth and sixth brigades, which will include improved capabilities in the areas of aviation, fires, networking and sensors. The SBCT 1 (3rd Brigade, 2nd Infantry Division (3/2 IN)) was deployed to Operation Iraqi Freedom in the fall of 2003. The SBCT 2 (1st Brigade, 25th Infantry Division (1/25 IN)) is stationed at Fort Lewis. 1/25 IN is currently receiving new equipment and conducting individual and collective

Figure 11. SBCT 1 (3/2 IN) in Iraq

training. It is scheduled to attain operational capability in 2004, and the actual date of operational availability may be advanced due to acceleration in equipping and training. One SBCT will be relocated to Europe. The remaining SBCTs are:

- SBCT 3 is the 172nd Infantry Brigade (Separate) stationed at Forts Richardson and Wainwright, AK.
- SBCT 4 is the 2nd Cavalry Regiment (Light) stationed at Fort Polk, LA.
- SBCT 5 is the 2nd Brigade, 25th Infantry Division stationed at Schofield Barracks, HI.
- SBCT 6 is the 56th Brigade of the 28th Infantry Division (Mechanized) of Pennsylvania Army National Guard.

Stryker Brigade Combat Teams (SBCTs)

SBCTs provide a tremendous capability toward the security of our nation. They provide Combatant Commanders a rapid response force that conducts distributed and dispersed operations, especially suited for operations in complex and urban terrain, with significant enhancements in combat power empowered by situational awareness. A unique asset, Stryker Brigades can follow forced entry operations conducted by SOF and/or the 82nd Airborne Division, with a mobile, lethal, and survivable early-entry force. Prior to the formation of SBCTs, this was not possible; the Army's follow-on forces were either additional light forces which lacked lethality, tactical mobility, and protection; or heavy mechanized and armored forces which were not rapidly deployable, required a large logistics tail, and faced potential mobility challenges once deployed in austere environments where bridges could not handle heavier vehicles, as experienced in Kosovo.

SBCT Capabilities. SBCTs fill the near-term capabilities gap between heavy and light forces and bridge the gap between the Current Force and the arrival of the Future Force by combining the best characteristics of heavy, light and SOF and through the procurement of new equipment backed by enabling doctrine and training, all integrated into an improved force design and enabled by installation and range upgrades that allow Stryker units to fully optimize training time. Core qualities of the SBCTs include:

- Rapidly deployable
- Full-spectrum-capable
- Mobility via C-130 and C-17, as well as self-deployable over operational distances by land
- Joint and coalition interoperability

Figure 12. Stryker offloaded from a C-130

- Combat-capable upon arrival with minimum preparation
- Precision, internetted combined arms fighting qualities
- Decisive action from deliberate maneuver to dismounted infantry assault
- Force effectiveness in complex and urban terrain situations
- Decreased sustainment footprint, derived from use of a common platform, better reliability and fuel efficiencies
- Ability to operate under joint or Army headquarters
- Reachback operations for joint, Army intelligence, analysis, logistics, fires, and force protection

To achieve a rapid deployment threshold, SBCT design capitalizes on the widespread use of common vehicular platforms, coupled with reduced personnel and a smaller logistical footprint in theater. Preconfigured in ready-to-fight combined arms packages, the entire SBCT can deploy and begin operations soon after arrival and with minimum preparation at points of entry. As an early-entry force that can follow a forcible-entry operation, or arrive under permissive conditions, SBCTs provide the Combatant Commander with a force optimized primarily for employment in small-scale contingencies in complex and urban terrain. SBCTs are particularly suited for confronting low- to mid-range threats employing both conventional and asymmetric capabilities. If necessary, particularly at the higher end of the operational spectrum, SBCTs can be augmented with additional capabilities through the time-tested concept of task organizing for combat.

Changing the organization of the SBCT generally falls into two categories: augmentation or scalability. The SBCT is scaleable in terms of its ability to accept like-type additional forces to expand core tasks and functions already resident in the SBCT (e.g., attaching additional infantry or reconnaissance assets). The SBCT is also capable of accepting temporary augmentation, consisting of units and/or capabilities not resident within the brigade (e.g., attaching air defense, military police, civil affairs, psychological operations, or aviation assets). In both cases, units will execute their normal mission essential tasks and therefore will not require extensive training in order to deploy or operate.

In many contingencies, SBCTs might be organized to operate directly under a Joint Task Force (JTF) headquarters. In other contingencies, SBCTs will fight under the direct control of a higher Army headquarters such as a division or corps. When deployed with a combined arms division, SBCTs will provide the division the capability to conduct stability and support or security operations simultaneously with warfighting, and will enhance the division's capabilities to operate in urban and complex terrain. The rapid tactical mobility and reduced sustainment burden of the SBCT maximize its employment for exploitation and pursuit operations. Whether subordinate to a JTF or Army headquarters, the higher echelon will assist the SBCT in establishing reachback linkages to the next higher echelon to expand its capabilities in the areas of information, intelligence, joint effects, force protection and sustainment.

Requirement for SBCTs. The conversion to an SBCT design is based on thorough analysis of the security environment and anticipated operational requirements. The strategic rationale is as follows:

- Converting four active duty brigades (three light and one heavy) and one active duty cavalry regiment to a common SBCT design provides a needed force management foundation for the Army rotational base to sustain deployment and training requirements.

- Converting the 56th Brigade, 28th Infantry Division (Mechanized) provides the force depth necessary to meet SSCs, increases the flexibility of the strategic reserve, and begins cultural transformation of the Army's Reserve Component.

- The SBCT stationing strategy best supports the overall Defense Strategy by orienting three SBCTs towards the Pacific and one in Europe, although these brigades are still globally responsive.

- Increased capabilities to Combatant Commanders by locating a rapid deployment force in Europe and providing the Pacific with more lethal and survivable forces.

SBCTs also allow the Army to balance today's training and wartime readiness requirements with the need to expose Soldiers to organizations they will lead in the Future Force. The SBCTs are essential to changing the culture of the Army and present a rare opportunity to transform every part of the Army: Active and Reserve, light, heavy, cavalry, forward-deployed and U.S.-stationed, and finally both the operational and institutional Army.

SBCTs and the Future Force. Transforming the Current Force to the Future Force introduces an operational risk associated with unit conversion, training, and attainment of a Future Force operational capability. The enhanced warfighting capabilities of SBCTs

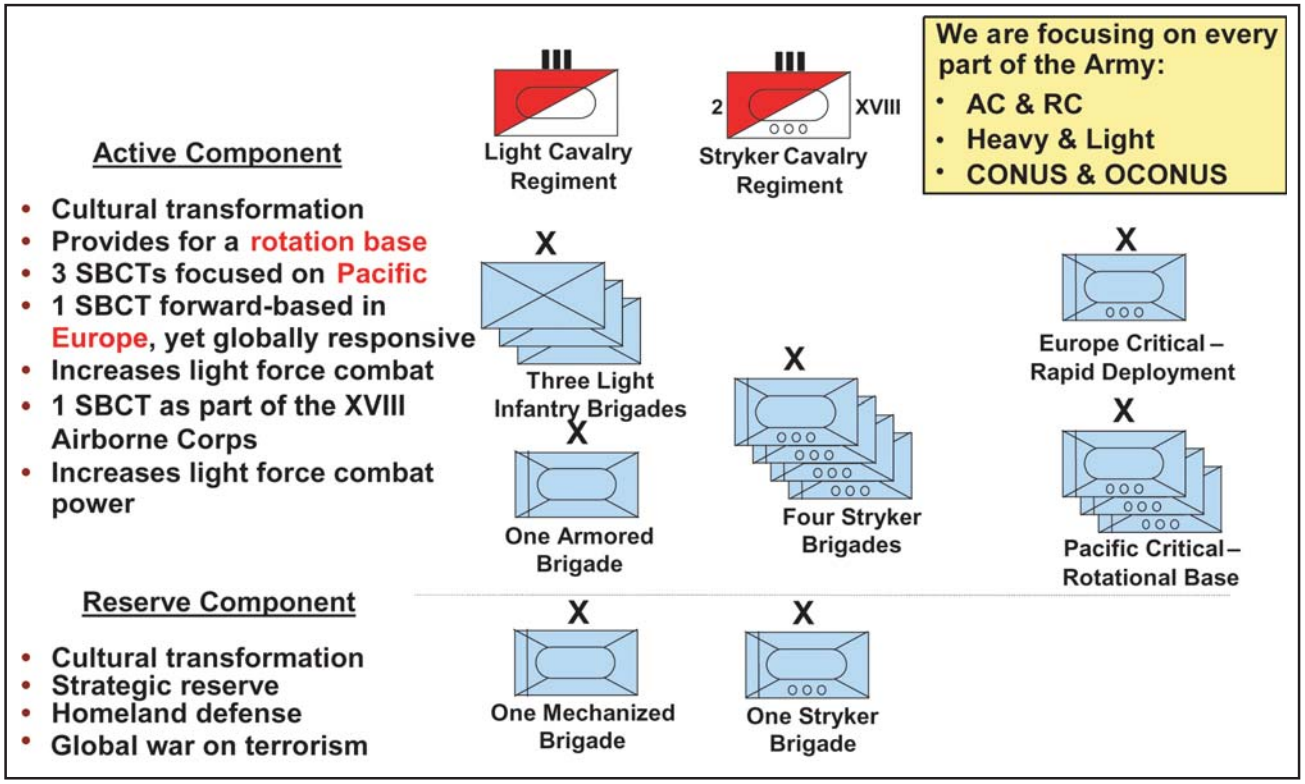

Figure 13. SBCT Requirement

greatly reduce that risk by providing a capability that is optimized for asymmetric crises we will most likely face this decade. SBCTs also provide the Army with other considerable benefits that will assist in the transformation to a Future Force design.

First, converting units to an SBCT design has required the Army to develop and produce advanced warfighting doctrine that fully supports the rapid, distributed, and dispersed knowledge-based operational qualities of the SBCT. These qualities will be magnified in the Future Force Unit of Action (UA) and will require the development of additional supporting doctrine. By producing SBCT doctrine now, the Army has successfully laid a strong foundation for future doctrinal work.

Second, the application of SBCT doctrine at unit level has led SBCT forces to develop new tactics, techniques and procedures (TTPs) that are unlike those associated with the Army's Current Force. An example of this is found in reach operations, where Soldiers assigned to SBCTs use their joint information network, enabled by links to higher headquarters, to obtain and access required resources from home station or outside the operational area to provide Intelligence Overwatch to the deployed SBCTs. This capability will continue to evolve and refine as the Army moves toward a Future Force capability.

Third, the combined effects of rapid system procurement (Stryker Armored Vehicles), accelerated development of advanced warfighting doctrine and associated TTPs, distributed and dispersed operations enabled by networked capabilities, all integrated into a combined arms design down to company level, have caused a profound and needed cultural shift within the Army. This cultural change is a critical first step in the development of Soldiers and leaders who will fight in Future Force units designed to excel in the nonlinear, asymmetric battlefield of the future.

Although SBCTs are an important bridge to the Future Force and will inform Future Force design and doctrine, they do not possess Future Force qualities. Two examples are found in the areas of lethality and survivability. While the Army has ensured SBCTs have tank-killing capability in close, compartmented urban environments, they still lack sufficient lethality to operate at the higher end of the operational spectrum (in environments of open, rolling terrain against armor/anti-armor threats that are of necessity assigned to today's armored forces) without augmentation, particularly on the future battlefield where adversaries are likely to use advanced armor technologies. In the Future Force, FCS-equipped UAs will feature a networked fires architecture enabled by advanced heavy weapons, launch systems and penetrators that will ensure the destruction of any potential armor system on the future battlefield with a high assurance of first-round hit. Several technologies such as the Compact Kinetic Energy Missile, Javelin P3I, and the electromagnetic gun are examples of potential Future Force lethality not available to SBCTs and not engineered for integration into the Stryker platform. Other science and technology (S&T) lethality efforts with potential to be integrated into the FCS include a multi-role armament system; advanced warheads with miniaturized, multi-mode seekers; and development of solid-state lasers for both ground-to-ground and ground-to-air engagements.

Similarly, SBCTs do not have the same level of survivability that is planned for the Future Force. This enhanced survivability will be derived from C4 and ISR that provides the commander with unparalleled situational awareness, thereby allowing him to see, understand and act first, and if engaged, the ability to survive being

acquired and fired at first. Ceramic armors and "smart" armor systems coupled with active protection systems are potential FCS components that will allow the UAs to fight and survive at the highest end of the operational spectrum. Other examples abound, to include the ability of FCS-equipped UAs to exercise battle command on-the-move (a Future Force concept) or drastically reduce logistical footprint via the use of onboard water generation, fuel efficiencies, greater reliability, use of precision munitions, and leveraging of advanced diagnostics and prognostics that will predict vehicle repair requirements before failure, thereby eliminating the need for stockpiles of spare parts.

The Army's plan and strategy to transform itself to a Future Force is compelling. The Stryker Brigades are a critical component of that strategy. Designed to fill a near-term capabilities gap and provide the bridge from the Current to the Future Force, the SBCT provides a Combatant Commander with an early-entry combined arms force that is deployable on the U.S. Air Force family of tactical aircraft, lethal, survivable and mobile, that does not exist anywhere in the nation's military today. Designed and optimized primarily for employment in SSCs in complex and urban terrain, confronting low-end to mid-range threats that may combine both conventional and asymmetric qualities, the SBCT is also capable of fighting at the higher end of the spectrum with augmentation. For the first time, the Army will have units that can enter complex urban environments, fight and win decisively with confidence. Stryker Brigades are required by the nation's Defense Strategy and represent a total DOTMLPF solution that integrates new equipment with enhanced capabilities into a strategically responsive force design, all supported by new doctrine, TTPs, and enhancements to ranges and installation training facilities.

Focused Logistics

In support of the overall goal of maintaining and improving the capabilities of today's force and transforming to a more capable force in the future, the Army has developed a corollary and essential plan to transform logistics. The Army logistics community exists to deliver materiel readiness to our Soldiers—a task that has remained the same for years. Today, the most critical task is to sustain the combat readiness of the Army's deployed force—the Army at war—and maintain the overall operational readiness of the Current Force. The Current Force must not only fight and win decisively against any threat, but it must also adapt to a changing operational environment. The fundamental challenge is to do what is required to enhance current capabilities, while still adapting and transforming Army logistics for tomorrow.

The Army delivers materiel readiness to the Current and Future Forces as the land power component of the Joint Force. Operation Iraqi Freedom presents a view of future military operations that guides Army logistics transformation efforts. At the same time, these operations and associated lessons learned reveal a number of shortfalls that the current logistics system faces on a 21st century battlefield. That battlefield is both joint and combined, and it is characterized by dispersed operations, decentralized execution, and an increased threat to the lines of communication and traditional "rear areas." In essence, Operation Iraqi Freedom is a 21st century war supported by a 20th century logistics system.

The successes enjoyed in Iraq were the result of the integrated logistics team of Soldiers, civilians and contractors who developed innovative solutions to a range of challenges and delivered readiness to the warfighter. Since

Operation Desert Storm, investments made in logistics systems produced a number of success stories:

- Major improvements made in airfields, seaports, railheads, and strategic lift platforms allowed Army units to deploy in record time

- Expanded Army prepositioned stocks consisting of combat-ready equipment allowed the JFC to build combat power in theater in a matter of days rather than weeks

- The Theater Support Vessel (TSV) provided the JFC a robust new option for intra-theater movement

The technological improvements made since Operation Desert Storm, however, have not extended fully to Army logistics forces, and there are some areas where significant effort and progress is required. To help realize the potential for the Army's logistics transformation, the logistics community is focusing on accomplishing clear objectives in four specific areas. These four areas are the Army logistics community's highest priorities and the targets for applying policies, processes, and resources.

Connect Army Logisticians. Today's logisticians have trouble "seeing the requirements" on the battlefield. Similarly, the warfighting customers cannot "see the support" that's coming their way. As a result, we still rely on pushing support based on the best estimate of what we think Soldiers need. The Army will solve this problem by connecting our logisticians. Army logisticians will be an integral part of the joint battlefield network, with satellite-

Figure 14. Focused Logistics

based communications that give them full-time connectivity on demand, enabling them to pass and receive key data from the battlefield to the industrial base. This connectivity will cover the battlefield, and will give logisticians the agility and flexibility to quickly plug and unplug into and from a dedicated network, with a stand-alone capability.

The Army logistics community will work in concert with ongoing efforts on the network to ensure logistics communications solutions are embedded within the Army's network, and will optimize joint and combined operations in an expeditionary environment. The logistics COP will be enabled by this network connectivity and will provide the vital link in the joint commander's ability to "see" his force and make decisions based on accurate, real-time logistics information.

Modernize Theater Distribution. Effective theater sustainment rests solidly on the fundamental concepts of distribution-based logistics, and we need a single focus on the simple task of guaranteeing delivery, on time, every time. The Army must employ a distribution system that reaches to the Soldier at the point of the spear, from the source of support, wherever that may be.

The goal is to strengthen warfighter confidence by increasing visibility and establishing flexible, responsive distribution capabilities. We will not need to store large quantities of supplies forward, but rather will respond to customer requirements with speed and precision. The Army's logistics community and U.S. Transportation Command seek to develop this solution from factory to foxhole in the joint environment. Along with the Army Materiel Command (AMC) and the Defense Logistics Agency (DLA), we are committed to enabling an effective distribution-based sustainment process.

Modernize Force Reception. We have invested well over the past 10 years in improving our ability to deploy rapidly from our CONUS platforms. The strategic movement of forces by Large Medium Speed Roll-on/Roll-off Ship (LMSR) and C-17 aircraft has significantly enhanced our capabilities. However, we have not invested at the other end —our ability to receive forces in the theater is still hamstrung by the lack of a deployable headquarters that focuses on joint theater-opening tasks. Today, we build support organizations "on the fly" to execute aerial and seaports of debarkation operations, and we depend on forces from several organizations to establish the theater sustainment base. This process takes time, a luxury we will not have as the Army develops an expeditionary structure that is capable of deploying joint-capable force modules more rapidly than ever before.

To effectively receive this expeditionary force flow and to facilitate immediate operational employment and sustainment, the Army will design an integrated theater-opening capability that can respond on extremely short notice and execute critical sustainment tasks immediately upon entry. That theater-opening capability will not be an ad hoc organization—it must be a support organization that has trained to perform the tasks, is enabled with the right tools to succeed, and has the capacity to expand to meet theater growth. The critical operational tasks that this organization must accomplish are: (1) provide operational sustainment C2 with reachback capability and initial network visibility; (2) conduct theater reception, staging, onward movement and integration operations, to include life support, force protection and operation of ports of debarkation; (3) sustain forces in theater, to include theater distribution and requirements visibility.

Integrate the Supply Chain. Over the past several years, the Army has reduced stockage levels at several echelons for various reasons. We changed Army policy several years ago to reduce the number of items carried on unit prescribed load lists while simultaneously reducing stockage levels at many authorized stockage lists across the field Army. Additionally, we took risk at the strategic level by underfunding our strategic spares programs. The cumulative result of these reductions is a "leaned out" supply chain without the benefit of either an improved distribution system or an enhanced information system. As a result, our Soldiers are at the end of a long line of communications, with reduced inventories and an old distribution system, and that system does not support them.

The Army will immediately view the supply chain in a holistic manner to ensure we understand the impact of actions across the entire chain, not just at a single level or within a single Service. This joint, end-to-end view is absolutely essential if we are to provide the kind of support our Soldiers deserve. The solution is an enterprise view of the supply chain and a Service and agency integration of processes, information and responsibilities. We are committed to developing the Army's enterprise solution to the supply chain in close coordination and alignment with DOD's Focused Logistics initiative. At end state, joint information will be freely and automatically shared between strategic-, operational- and tactical-level headquarters and agencies. Consumers and logisticians from all agencies and Services will enter local supporting systems, plug into the sustainment network, and be afforded end-to-end Joint Total Asset Visibility. Combined with the efforts under "Modernize Theater Distribution," commanders will be capable of seeing inventory in motion and inventory available at storage locations, and developing and implementing decisions that will meet the Combatant Commander's requirements rapidly and effectively.

The Army's focus is directed at building and reinforcing confidence in the minds of the Combatant Commanders and across the broad spectrum of units, agencies, allies and other entities we support by delivering sustainment on time, every time. We can only do that if we provide logisticians the capability to "see the requirements" every day and control the distribution to guarantee precise, time-definite support. Army logisticians will be part of joint and combined logistics processes that leverage speed to deliver focused logistics. We will integrate real-time total asset visibility and seamlessly connect to the industrial base. This will result in a logistics common operational picture that will enable the kind of end-to-end control that always delivers the right support, to the exact location, at the precise time needed. If we do not connect our logisticians, improve the capability of our distribution system, modernize force reception, provide integrated supply management and give the JFC total asset visibility, we will be studying these same lessons after the next major conflict. The Army's logistics community is committed to ensuring that we do not have to relearn these same lessons in the future.

Industrial Base Modernization

A modern industrial base is essential to the overall success of Army logistics transformation. The AMC envisions the industrial base as a complementary and synergistic mix of commercial and organic industrial base capabilities and capacities. These capabilities must be maintained in modern operating condition to ensure quality and enhance productivity, as well as encourage public-private partnerships to include investment opportunities for modernization.

The organic industrial base consists of Army owned arsenals, maintenance depots, and ammunition plants. Given the Army's national defense mission and Title 10 responsibilities to support other Services, the unique characteristics of some of its equipment and the demand for readily available replacements, it is necessary to maintain certain industrial capabilities within the Army. In this regard, Program Executive Offices will also identify any depot facility requirements necessary to support new systems that are being fielded. Using partnership relationships with industry and applying innovative technologies to production and maintenance processes, the Army can transform its industrial base efforts into the future. This will be accomplished through full utilization of an organic workforce and capabilities for core missions and synergistic partnerships with private-sector developers where appropriate. This will enable the Army's industrial base to be effective and responsive to supporting the Future Force as well as continue sustaining current operations.

The Army's transformation process must present a balanced approach to the Future Force. It not only must encompass the development and procurement of combat systems and capabilities, but must also be balanced with an effective logistical support system and responsive industrial base.

The Future Force—Enhanced Capabilities for the Joint Force Tomorrow

The Future Force is the Army's future full-spectrum force—organized, manned, equipped, and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable and sustainable across the entire spectrum of military operations from major combat operations through counterterrorism to homeland security. Future Force units will conduct operational maneuver from strategic distances and arrive at multiple points of entry, both improved and unimproved. As necessary, Future Force units will conduct forcible entry, overwhelm aggressor anti-access strategies and capabilities, and rapidly impose our will on our opponents. In this manner, Future Force units arrive immediately capable of conducting simultaneous, distributed and continuous combined arms, air-ground operations, day and night, in open, close, complex, and all other terrain conditions throughout the battlespace. Army units conducting joint and combined operations will see first, understand first, act first and finish decisively at the strategic, operational, and tactical levels of war.

Army Future Force units will dominate land operations, providing the decisive complement to air, sea and space operations. They will create synergy within the Joint Task Forces (JTFs) by controlling the ground, where people and political authorities reside. Combined precision maneuver and precision strike capabilities, linked by decision superiority, will defeat our opponents in their protective sanctuaries in detail or force them into the open where they can be destroyed with joint fires. The psychological effects produced by the power and precision of Future Force units will serve to deter hostile acts, both prior to deployment and during the stability phases of operations. The presence of Future Force leaders and Soldiers, dispersed across the battlespace yet operationally integrated through an information network, provides the JFC situational dominance in applying lethal and nonlethal effects with unprecedented precision across the spectrum of military operations.

Information superiority is a key enabler for achieving the Army's transformation goals and its modernization into the Future Force. Army Knowledge Management (AKM) is the Army's

strategy to achieve this objective by transforming itself into a network-centric, knowledge-based force. A commander-focused, intent-centric environment will be the hallmark of information-empowered operations in the future, bringing situational awareness of

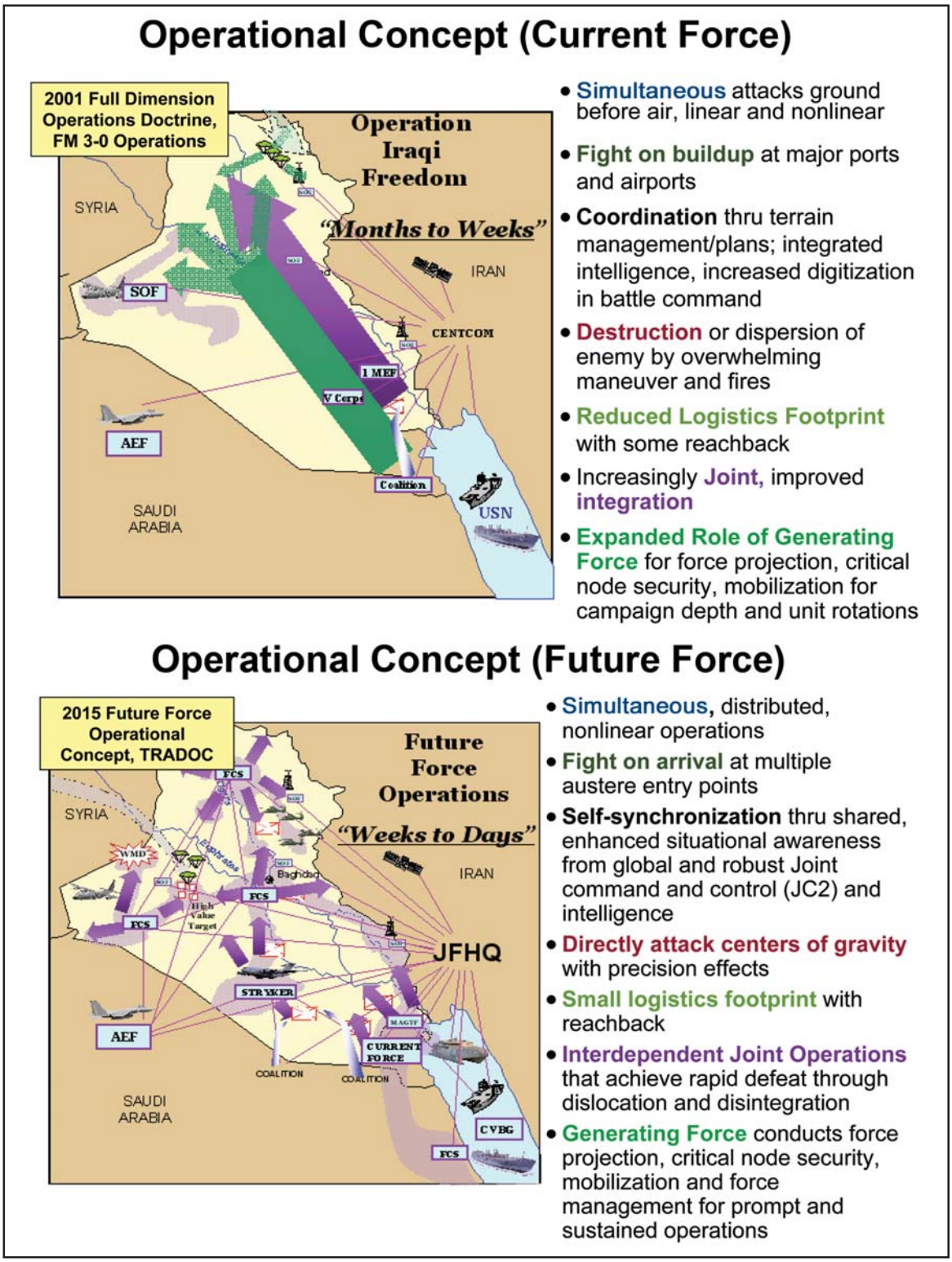

Figure 15. Current to Future Force

the total environment—friendly, neutral, unknown and enemy—to the commander, where and when he needs it, in an intuitive format. Further, it will allow him to collaborate both vertically and horizontally with other leaders to seize and maintain battlespace understanding to act first and finish decisively. The technologies that support this sort of warfare must be augmented by appropriate changes in doctrine, organization, training, leadership, and education to exploit the power of knowledge management and to achieve a capabilities-based Army for 2010 and beyond. This effort is an integral part of the Army's transformation. AKM will vastly improve information superiority for our warfighters and business stewards in the battlespace, in our organizations and in our mission processes supporting logistics; intelligence, surveillance and reconnaissance; personnel management; medical services; and the training and education of Army personnel worldwide. To this end, the Army has recently activated the Network Enterprise Technology Command (NETCOM) as the Army's single authority to operate, manage, and develop the Army Knowledge Enterprise (AKE). NETCOM is now implementing the Army's enterprise concept for voice, data, and video networks, improving network capacity, performance, and security across the AKE. Accordingly, NETCOM has assumed technical control of all Army networks including those of the Army National Guard and Army Reserve.

The Army recognizes that achieving information superiority requires more than network connectivity. We must leverage the power of all available Army, joint, interagency, and multinational ISR capabilities in support of the Future Force. Analytic Overwatch is an advanced concept for providing sustained, responsive, relevant intelligence analytic support of maneuver brigades and battalions. Analytic Overwatch is premised on an understanding that centers of analytic expertise, culturally aligned with the maneuver force, will be key enablers of brigade and battalion operations. Analytic Overwatch is a mission activity in which operationally aligned and responsive analytic capabilities are consistently focused on the maneuver brigade and battalion knowledge challenge. The core foundations of Analytic Overwatch are cultural alignment with the supported brigade or battalion, direct operational responsiveness to the supported force, anticipation of supported force requirements, the ability to produce products before the force realizes they need them, and the assured robust communications paths to provide usable products in a timely manner. Analytic Overwatch is core to the emerging Distributed Common Ground System (DCGS) net-centric model of warfare.

Fundamental to Overwatch is the ability to provide tactically relevant intelligence to materially assist operational planning and force engagement preparations. Overwatch materially aids the synchronization and integration of brigade organic intelligence capabilities. The Overwatch activity strives to collapse time around analytic activity as it fights for relevant knowledge and information consistent with the tactical force plan. Through the use of powerful software tools and advanced analytic capabilities and accesses, analysts operating in Overwatch scan voluminous amounts of raw data and information in search of key indications and warning of future threat activity and immediate intentions. En route intelligence updates geared to tactical force knowledge requirements are a key feature of Overwatch. Optimally, Analytic Overwatch operates to build the knowledge foundation upon which sensor-to-shooter/-decider activities can be initiated while forces are en route for immediate action upon arrival. Anticipation, understanding, responsiveness, and relevance are all

characteristics of a well-executed Overwatch function. Overwatch provides support to the engaged force while anticipating transitions and future operations. The Overwatch function sustains knowledge overmatch for current operations while simultaneously providing analytic products to assist concurrent planning.

Networked Analytic Centers are the platforms from which the Analytic Overwatch mission is executed. First and foremost, Networked Analytic Centers are centers of analytic and intelligence management expertise optimally enabled by their connectivity forward to maneuver brigades and battalions, laterally with other tactically focused analytic centers and upward/rearward with the full range of joint, national and multinational intelligence capabilities. The concept provides maneuver brigades and battalions tasking authority to Networked Analytic Centers.

Future concepts for Networked Analytic Centers generally operate from large, fixed or home station locations. This concept transitions existing corps and echelons above corps (EAC) units to an Intelligence Overwatch organization. They are generally not categorized as deployable but are relocatable depending on operational conditions, facilities, and connectivity. The analytic centers are optimally enabled from locations where they have access to a robust and reliable communications and information technology architecture. Additionally, they are constructed with modular, scaleable assets capable of relocation to support mission requirements forward. A Networked Analytic Center can be located anywhere analysts, communications and sufficient technology infrastructure can be made available, consistent with operational necessity. However, the focus is on providing expert, timely, relevant knowledge to enable tactical decision making at the brigade and maneuver battalion levels.

Space systems increasingly provide critical support for ground warfare force enhancement functions including intelligence, surveillance, and reconnaissance; communications; warning; combat identification; positioning, velocity, navigation, and timing; battle damage assessment; and monitoring of weather, terrain and the environment. Joint space-based capabilities aid the implementation of Future Force concepts, particularly in respect to achieving information superiority, creating situational awareness, and operating within the high tempo, noncontiguous, simultaneous framework of distributed operations. To accomplish these tasks, Army space stakeholders participate in joint efforts to insure future space systems and services will provide responsive, timely and assured support to commanders at all echelons and be fully integrated with air and terrestrial-based battlefield systems. Fully integrated joint space force enhancement will provide depth, persistence and reach capabilities from national to tactical levels that organic Army systems alone could not provide. Space force enhancement to warfighters will be generally transparent because it is so fully integrated into supporting processes and products. Although awareness of space's role may not be apparent, warfighter reliance grows steadily as does its potential advantage to adversaries. Combined, these dynamics make development of space control capabilities a priority. Army space stakeholders participate fully in joint space control development efforts. Maturing Army space cadre experience and leadership will ensure Soldiers will be knowledgeable, skilled and confident in working with space systems and products and will view space-based operations as integral and routine parts of military operations.

Future Force units will make significant contributions at all three levels of warfare: strategic, operational and tactical. At the

strategic level, Future Force units will continue to meet the Army's nonnegotiable contract with the American people to fight and win our nation's wars. Future Force units will also continue to provide the Army's unique contribution to national security: sustained land dominance across the range of military operations and spectrum of conflict. Army Units of Action will comprise the tactical warfighting echelons of the Future Force, filling the same role as today's brigades and lower echelons.

At the operational level, the Army provides headquarters that act as integrating agents within joint, interagency and multinational teams. Designated Future Force headquarters and major commands (which will be characterized as Units of Employment (UE) at what is now equivalent to corps and division levels), will act as JTF Headquarters, Joint Force Land Component Commands (JFLCC), and/or Army Forces (ARFOR) command headquarters. Army headquarters at all levels will also be integral parts of any Standing Joint Task Force (SJTF), which may be formed by the respective Combatant Commanders to provide seamless joint command and control. For land campaigning, the Future Force will provide operational-level decision and information superiority to JFCs, enabling them to gain and maintain operational initiative. Information superiority will be gained through operational level ISR; information management (IM); and information operations (IO). When coupled with Future Force land campaign planning expertise, information superiority enables JFCs to see first, understand first and act first at the operational level.

The Army's ability to dominate the tactical level of war—the short-sword warfight—upon which operational and strategic success is built, is essential for Joint Force success on land. Recognizing what is possible at the tactical level has been the subject for years of intense Army study and wargaming and, more recently, training enhanced with networked situational awareness within Current Force formations. Future Force units will be optimized to win on the offensive, to initiate combat on their terms, to gain and retain the initiative, build momentum quickly and win decisively. They will be capable of mastering the transitions in warfare—from fort to foxhole, from offense to defense, from warfighting to support operations—to maintain operational momentum and threaten retention of the initiative. At the tactical level, Future Force Units will see first, understand first, act first and finish decisively as the means to tactical success. Operations will be characterized by developing situations out of contact; maneuvering to positions of advantage; and engaging enemy forces beyond the range of their weapons, destroying them with precision fires and, as required, by tactical assault at times and places of our choosing. Commanders will accomplish this by maneuvering distributed and dispersed tactical formations equipped with FCS and Objective Force Warrior (OFW) for the dismounted Soldier and his leader, and enabled by networked battle command capabilities for common situational awareness. With these capabilities, the Future Force will master the transitions at all levels of operations.

Units of Action (UA) and Employment (UE)

As part of its overall transformation process, the Army is assessing the echelonment of future formations. It is envisioned that the Future Force, enabled by networked battle command, will conduct operations that are jointly integrated at a much lower level of command than today. Current thinking is focused on use of the organizational constructs referred to as UA and UE. Both of these levels of organization

are intended to provide the JFC with units that will accomplish the full spectrum of missions the Army is called upon to perform—from homeland security to humanitarian assistance to SSCs or MCOs. As part of the major restructuring effort underway, the Army will create units having a modular UA and UE organizational design. The UE design (both UEx and UEy) will transform the Army from three to two standing echelons (Figure 16).

Units of Action

The Army accomplishes the full spectrum of these missions today through the application of multiple ground combat formations and organizations. These include Special Forces groups and the Ranger Regiment, airborne, light infantry, Stryker Brigades, mechanized infantry, armor and armored cavalry, and air assault formations. These formations address the entire range of threats and all conditions and variables in which these forces will be employed. The UA will apply to the mission sets of these combat formations with the exception of Special Forces, Ranger and airborne forces. T he Army currently has multiple organizational designs under development for the Unit of Action. Brigade Combat Team UA designs include Armored, Infantry, Stryker, and the FCS-equipped UA. These UAs are designed and organized for close combat and stability operations. Support UA designs include Aviation, Sustainment, Protection, Strike, and Reconnaissance and Surveillance. The Support UAs are designed and organized for multifunctional and functional support operations.

The capabilities of the UA are balanced across the desired Future Force characteristics of responsiveness, deployability, agility, versatility, lethality, survivability, and sustainability.

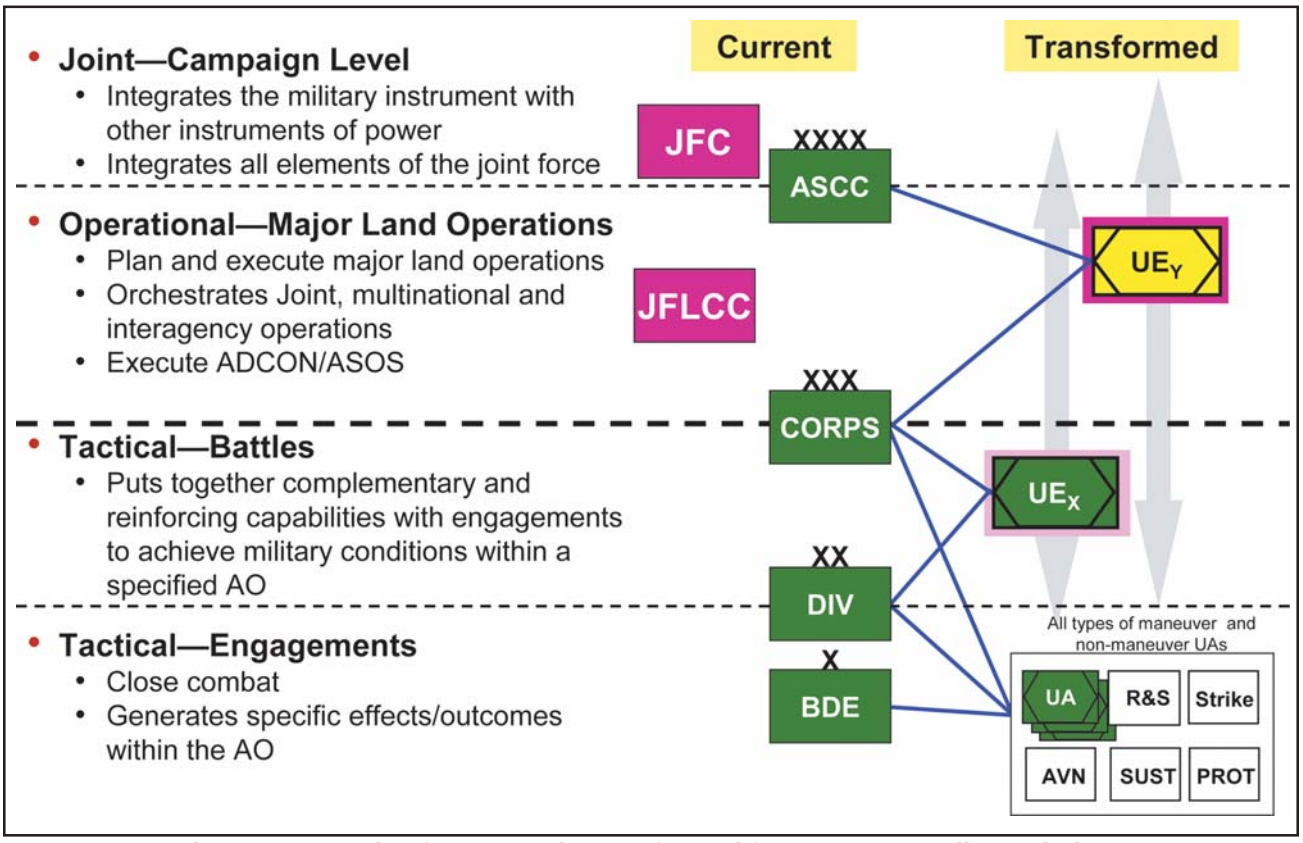

Figure 16. Levels of Command–Transformed from 3 to 2 Standing Echelons

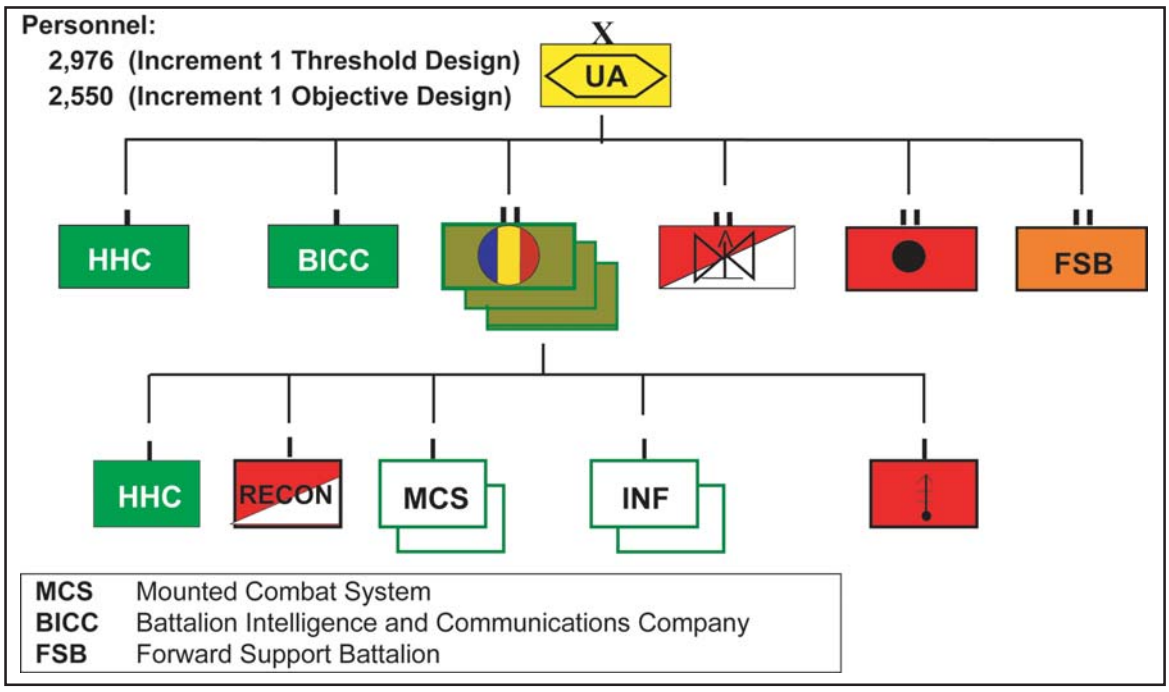

Figure 17. FCS-equipped Units of Action (UA) Organizational Design

Although optimized for offensive operations, the UA can execute stability and support operations. It employs a revolutionary networked, battle command architecture to vary its span of command and control and integrate UE or JTF supporting capabilities to accomplish its mission.

The hallmark of UA operations will be the significant ability to develop situations out of contact, come at the enemy in unexpected ways, use teaming with leader initiative, maneuver to positions of advantage with speed and agility, engage enemy forces beyond the range of their weapons, destroying them with enhanced fires, and assaulting at a time and place of our choosing. Although not necessarily sequential, it is the combination of fires (precision and volume) and maneuver, and the tactical assault that makes the enemy's problem so difficult. The cumulative effect of simultaneous, multidimensional operations will be to dominate an adversary, enabling friendly forces to destroy, dislocate and disintegrate him and transition to the next engagement.

Designed to ensure campaign quality, the UA not only has the responsiveness and deployability to achieve a 96-hour deployment goal, but it is specifically designed with the durability, endurance and stamina to fight battles and engagements for the duration of a campaign, focused on the decisive points and centers of gravity. Given its inherent tactical mobility, it can land at points removed from its objectives, out of range of enemy defenses, and then move by land to complete its mission. This capability applies not only to entry operations, but also to theater operations throughout the campaign.

The UA will master the transitions in warfare that sap operational momentum and threaten initiative retentions. Superior situational understanding delivers the advantage required to close with and destroy the adaptive and asymmetric adversaries of the future and allows the commander to set the requisite conditions for mission success in purpose, time and space.

The UA is not a fixed organization. It has the capability to command and control up to six maneuver battalions and its C4 and ISR architecture enables the UA to increase its span of control. The UA can be tailored for specific missions and between missions in the campaign and is able to employ a range of supporting capabilities, from a UE or a JTF, to perform a variety of missions such as reinforcing fires, air and missile defense or civil operations.

Historically, uncertainty about friendly and enemy conditions on the battlefield often dictated cautious movements to contact. Forces lost both time and resources developing the situation while in contact, followed by the initiation of decisive action at a time and place that was not necessarily of choice. UA capabilities intend to break this paradigm and develop situations out of contact and destroy enemy forces at the commander's desired time and place through improvements in:

- Information dominance that allows unprecedented situational awareness and understanding
- Embedded, robust, all-weather 24/7 ISR
- Ability to plan collaboratively and rehearse virtually while on-the-move, arriving at the objective on parallel axes
- Inherent air-ground integration
- Manned/unmanned teaming with organic unmanned weapons systems
- Standoff destruction of enemy systems with assured lethality featuring a high probability of a hit and equally high probability of kill, all beyond the range of the enemy's weapons

The UA has the ability to develop the situation before, during and after contact, affording leaders and Soldiers unprecedented situational dominance with revolutionary competencies and capabilities. The UA acts within a new tactical paradigm based upon the quality of firsts: see first, understand first, act first and finish decisively.

See First. UA leaders see the entire battlefield—the parts, the whole and the surrounding environment, including terrain, weather, and population implications—that affect operations. They must know, think and understand several steps ahead of the enemy while simultaneously ensuring the enemy sees last. This is done through aggressive counterreconnaissance, which is especially focused on enemy air and UAV threats as well as enemy special purpose forces. Given the availability of national and joint assets, the UA will arrive in theater with somewhere between 50 percent knowledge of enemy situation in open, rolling terrain to as low as 10 percent knowledge of enemy situation in major urban areas. Embedded ISR capabilities within the UA's organizational design, along with responsive joint sensors, will improve understanding of the enemy's disposition and capabilities to about 80 percent, thereby allowing the UA to develop the situation in open, rolling terrain while on-the-move from dispersed, parallel axes. In complex, urban terrain, the UA will require tactical patience while it isolates key areas and conducts deliberate reconnaissance to ensure its small units can see first and prevent enemy from gaining tactical surprise.

Understand First. Leaders must understand the enemy's patterns so they understand what information means and know what they must do with it. Much of this is accomplished by matching the UA's ISR results with external ISR databases through the Distributed Common

Ground System-Army (DCGS-A) to provide the UA commander with the tailored information required to recognize the tactical opportunities on the battlefield. Exploitation of these opportunities allows UA units to take actions that yield operational or even strategic results against the enemy's centers of gravity, decisive points and vulnerabilities. What is described here is more than "understanding" prior to contact and then hammering the enemy with fires to achieve a tactical decision. What is new is the UA's ability to employ understanding before, during and after tactical engagements to apply fires, fully integrated with maneuver, to achieve a tactical decision. Beyond understanding first, the UA leader forces the enemy to understand last through counterreconnaissance, deception, pattern avoidance and irregular battlefield geometry.

Act First. Seeing and understanding first—a continual process—gives commanders and their formations the situational dominance necessary to act first. Through the mastery of movement techniques, mutual support, fire and maneuver, control and distribution of fires, integrating combat power, assault, and transition, the UA leader takes cues when in or out of position, and executes with speed, agility and initiative. UA leaders create an organization that is built around excellence in small unit operations, armed with information dominance, and create conditions that allow leaders down to squad level to act on intent as never before. In the past, the Army has taught leaders to accumulate an overwhelming correlation of forces prior to acting. In the UA, leaders will routinely attack with a force correlation of 1:1 to 2:1. They will achieve this ability by an overwhelming dominance of situational understanding, which will allow the UA to act at these ratios by precisely attacking enemy forces from standoff, thus setting the conditions to finish decisively.

Finish Decisively. Finally, the UA finishes decisively by controlling the tempo of operations, denying the enemy freedom of action and destroying the enemy's ability to fight. The UA can maneuver, employ fires, and transition seamlessly while in contact. It is optimized for closing with and destroying the enemy when forces are joined by:

- Precise fires and precision maneuver while in contact
- Precision fires at standoff and mutual support on-the-move
- Assured mobility near the objective to avoid being trapped in enemy kill zones
- Dismounted infantry that exits their carriers with full situational understanding
- Tactical assault against all threats in any terrain and in all weather conditions

Critical to the ability to see first, understand first, act first and finish decisively at the strategic, operational and tactical levels is a force design founded on a set of characteristics that provides the force with the capability to be strategically responsive and dominant at every point on the spectrum of military operations.

Future Force Characteristics

The following seven characteristics of the Future Force are complementary features that together produce an overall capability greater than the individual capabilities they describe.

Responsiveness and Deployability. The UA is deployable and capable of quickly and rapidly concentrating combat power in an operational area. The UA can maneuver at operational distances by air, land, and sea to

arrive in coherent combined arms increments and fight upon arrival.

Agility. The UA has the ability to transition among the various types of operations and from one tactical engagement or battle to the next, based on advanced battle command on the move and communications and intelligence related systems that build and sustain superior understanding. The difference is that this design is based on strengthening the leader's ability to understand the environment and execute actions aggressively. This yields a greater level of competency in the combat skills of the leader and the led. The leader not only understands the environment, but can also share that assessment with other units very effectively. This level of situational understanding makes teaming resources or units nearly effortless, giving the UA incredible agility.

Versatility. The UA can move from task to task with great agility as stated above. Further, it can accomplish a broad range of missions, giving it unparalleled versatility. The UA has the inherent capacity to dominate at any point in the spectrum of military operations based on tailorability and modularity. It can be task-organized to accomplish a wide variety of missions. An essential characteristic of the UA design is its combined arms framework, which by its very nature provides improved mission breadth.

Lethality. The UA has assured overmatch against enemy line-of-sight (LOS), beyond-line-of-sight (BLOS) and non-line-of-sight (NLOS) fires in all conditions and environments. The foundation of the UA's improved lethality is its ability to aggressively employ small units and teams at the right time and place in the battlespace. Every element in the UA is capable of generating combat power and contributing to the fight and providing overwhelming lethality overmatch. This overmatch is based on several tenets:

- Firing first with assured lethality and assured kill
- Assured first-round kill to include avenge kill capability
- Precision
- Networked Army and joint fires
- Mutual support
- Develops situation out to 75km radius

Survivability. The UA takes advantage of technologies that provide maximum protection and survivability down to the individual Soldier level, on or off platforms. This is accomplished by leveraging low-observable technologies, active and passive protection systems, and force protection. Survivability is also achieved with the following capabilities:

- Information superiority
- Maximized cover and concealment techniques
- Superior dash speed employed from cover to cover
- Dispersed networked units that maintain mutual support in overwatch
- Lethality that assures first-round kill
- Effective suppressive and obscuration fires
- Trained and well-led Soldiers who are competent and capable of doing the right thing at the right time and doing it effectively

- Rapid augmentation by UE combat multipliers when dictated by mission, enemy, troops, terrain, time, and civilians (METT-TC)

Sustainability. The UA is able to conduct combat operations with a much reduced logistics footprint and lower consumption rates. The UA will operate for three days at a high operational intensity and up to seven days in a medium to low operational environment before it must be resupplied.

The UA's organizational design will provide significant improvements in the critical capabilities described above. However, there will frequently be times when the UA must be augmented by additional resources to ensure overmatch in these critical areas. The augmentation will be provided from the UE force pools based on METT-TC. In addition to more maneuver UAs, other potential augmentation could include maneuver support UAs (air defense, chemical, engineer, or military police) or maneuver sustainment UAs (maintenance, distribution, global health, supply and services, human resource support, religious support, legal support, financial management, or explosive ordnance demolition).

Units of Employment

The UEs are highly tailorable, higher echelons that integrate and synchronize Army, joint and multinational forces for full-spectrum operations at the higher tactical and operational levels of war. They link ground and joint forces and orchestrate ground operations that decide joint campaigns. They will be organized, designed and equipped to fulfill C2 functions as the ARFOR component, JFLCC or the JTF. UEs are the bases for combined arms air-ground task forces. They resource and execute combat operations; designate objectives; coordinate with multi-Service, interagency, multinational and nongovernmental activities; and employ long-range fires, aviation and sustainment while enabling C4 and ISR and tactical direction to the UA. The UE attains organic higher-level Army, joint and coalition effects to set conditions to enter battle on our terms, seize the initiative before contact and employ our strengths against enemy weaknesses.

The UE is subdivided into two echelons: UEx (higher tactical) and UEy (operational land). These highly tailorable and scalable headquarters will be designed around the future Battle Command System; both are modular entities designed to employ a tailored mix of forces.

The UEx is designed to be the primary controlling headquarters for the maneuver, maneuver support, and maneuver sustainment UAs. The UEx can serve as the ARFOR headquarters and combined JFLCC for an SSC without augmentation, or it can serve as the JTF headquarters for an SSC with an SJTF headquarters attached.

The UEy plans and conducts major land operations in a Joint Operations Area. It orchestrates decisive, shaping, and sustaining operations in support of the joint campaign. Without augmentation, it serves as a JTF headquarters for SSCs. For MCOs, the UEy can serve as ARFOR and combined JFLCC headquarters without augmentation. The UEy can also serve as the intermediate headquarters between a higher UEy and UEx during certain MCOs.

The UE focuses on battles, major operations and decisive land campaigns in support of joint operational and strategic objectives. They participate in all phases of joint operations from

initial entry to conflict termination in any form of conflict and operating environment and in all weather and conditions.

The UA normally fights under the command and control of a UE. The UA orchestrates multiple engagements to win battles. The UE employs UAs to achieve tactical decision. The UA

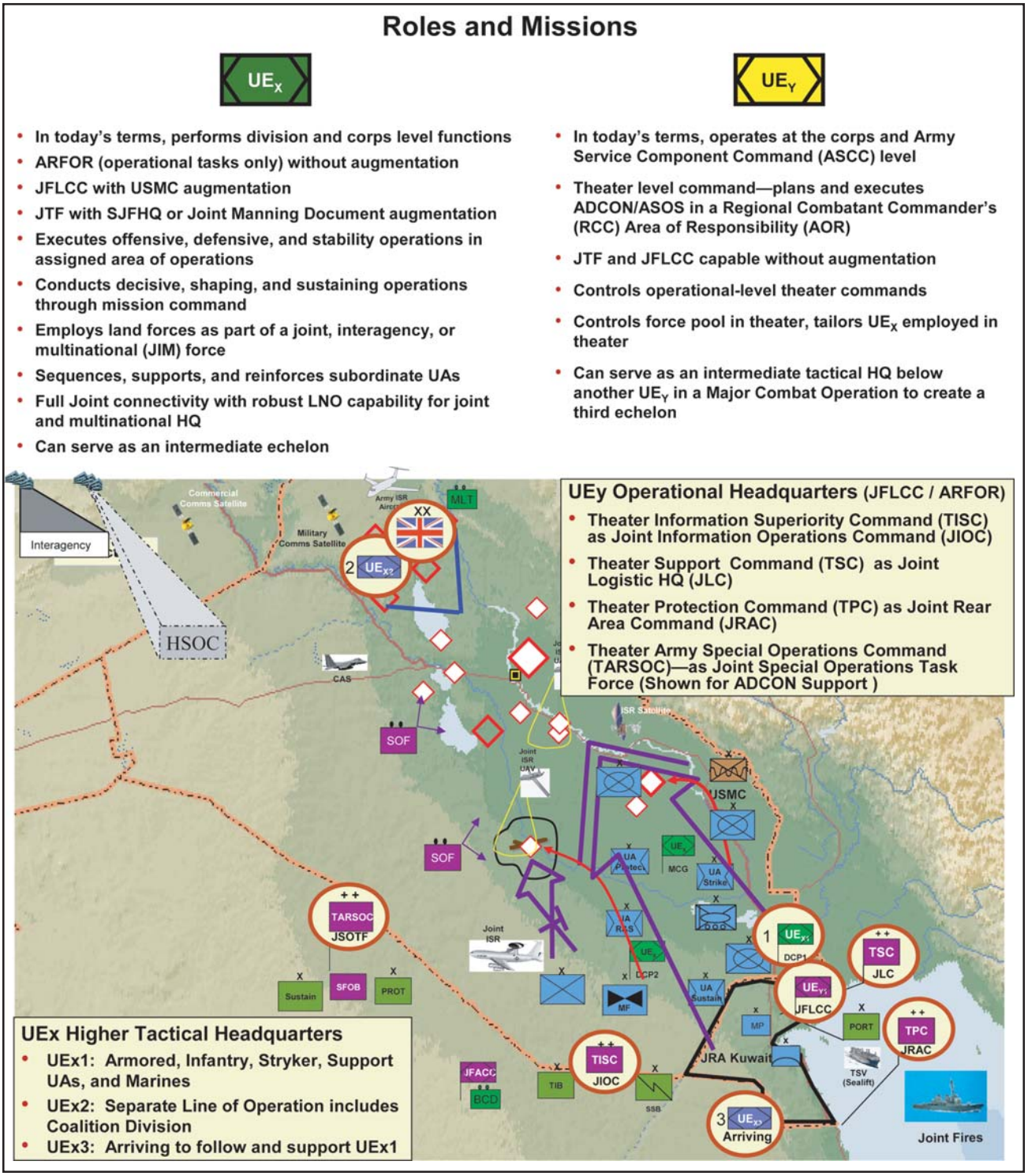

Figure 18. Fighting the Modular Army in a JTF

integrates organic and supporting ISR, fires and maneuver to close with and destroy the enemy.

The UE must be able to execute these core missions to enable success:

- Facilitate deployment, in total or part, anywhere in the world with little notice
- Develop the situation before forces are joined and gain information superiority
- Shape and isolate the battlespace
- Shield the force from enemy air and surface effects
- Direct entry and decisive operations to destroy, disintegrate and dislocate the enemy
- Air assault up to a maneuver battalion
- Synchronize operations and combat power
- Facilitate transitions to maintain tempo in multiple battles
- Sustain forces by synchronizing operations
- Provide enablers to the UA through the force pooling of maneuver, maneuver support, and maneuver sustainment UAs

As the Army moves forward in its transformation efforts, it continuously models and analyzes force designs and functions to ensure full-spectrum dominance. The UA and UE attributes and capabilities described above are the results of much analytical work designed to ensure the nation has the most effective warfighting force possible. As new technologies become available and as the Army analyzes and learns from its fielding and use of the SBCTS, the Army will continuously refine the UA and UE concepts and designs.

Modernization Strategy—Balanced Modernization

Modernization is a continuous process of integrating new Doctrine, Organizations, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) to develop and field warfighting capabilities for the Army to provide to the Joint Force in executing the National Security and Defense Strategies and all assigned missions. Modernization activities are facilitated and optimized by sound modernization and investment strategies that are specifically designed to implement the Army's transformation process. The modernization and investment strategies also establish common terms of reference for all modernization activities and, very importantly, provide clear priorities and focus for the allocation of resources for equipment expenditures. The overall Army modernization strategy remains focused directly on providing those necessary capabilities for the Current Force, which remains the foundation of the Army's readiness to fight and win decisively against any threat, while simultaneously supporting a transformation process to ensure that those capabilities essential for the future are being developed. The investment strategy in support of modernization describes the process used in deciding how to allocate monies across competing priorities in order to obtain the best capability for each dollar spent.

In support of the overall goal of maintaining and enhancing current readiness while also implementing transformation into a more responsive and capable force for the future, the Army has developed a coordinated and comprehensive strategy of integrating all its efforts and programs across the DOTMLPF toward the goal of equipping and organizing forces. This strategy can be described best as one of "balanced modernization," which seeks to develop and field combat-capable units through an appropriate mix of selective procurement and fielding of new equipment (modernization), rebuilding and upgrading of key existing equipment (recapitalization), and preserving needed elements of current equipment (maintenance). Modernization programs are placed into three basic categories and are then subcategorized based upon the force they are fielded to support.

These modernization strategy categories are:

- Modernization—the development and/or procurement of new systems with improved warfighting capabilities
- Recapitalization—the rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a zero-time/zero-mile system
- Maintenance—repair or replacement of end items, parts, assemblies, and subassemblies that wear or break

As an instrument for the most efficient use of these various means, the Army has an important process—Unit Set Fielding—which is designed to ensure achievement of the greatest combat capability across the force throughout the overall modernization process while maintaining the highest level of readiness and the lowest feasible expenditure of resources.

The modernization strategy also consists of the following two components, which help define a clearer focus for its implementation:

- Maintaining and improving essential warfighting capabilities of the Current Force to preserve military superiority for all possible missions. This includes the fielding of immediate operational capabilities by organizing and equipping six SBCTs; restoring and improving the readiness of units returning from operations through a comprehensive reset effort; and restructuring the Army to create modular units, thus increasing the readiness, number and responsiveness of Army brigades. Additionally, another critical element will be an accelerated effort to insert, where feasible, newly developed capabilities in the evolving Army concept, derived from emerging technologies.

- S&T efforts to enable timely fielding of the Future Force and, in particular, the FCS, which will be the foundation of that force. This also entails a corollary mission to identify and field selected new capabilities into Current Force units where appropriate and affordable.

Integrating across the DOTMLPF

The Army's transformation process includes a comprehensive examination of the interrelationships among doctrine, organizations, training, materiel, leadership

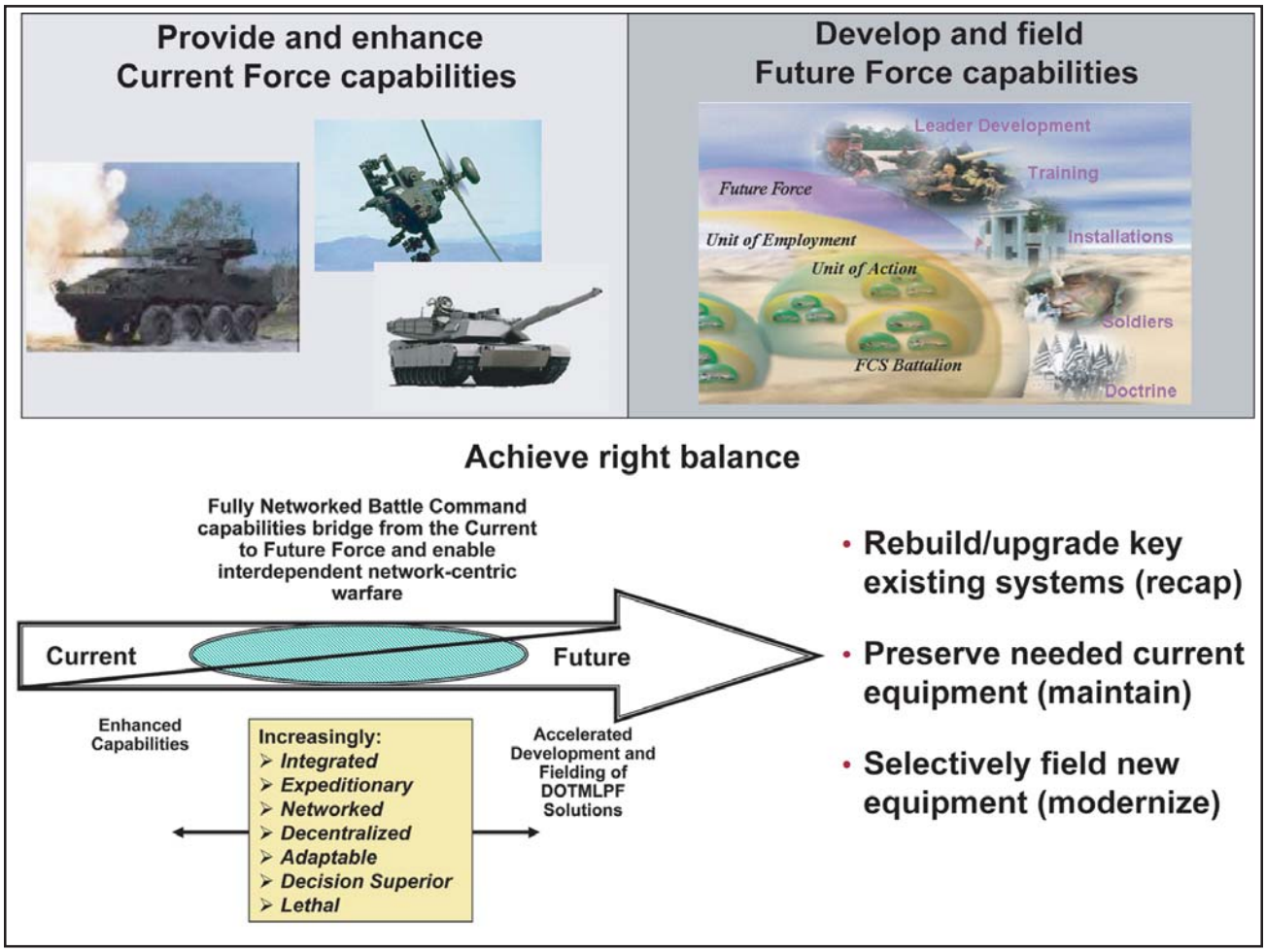

Figure 19. Modernization Strategy

and education, personnel, and facilities. As the Army fields new capabilities to the Current Force and evolves into the Future Force, it must optimize investments by ensuring the proper synchronization between DOTMLPF requirements and DOTMLPF solutions.

Transforming the Army has placed new demands on how leaders and Soldiers are managed throughout the force. With over one million Soldiers geographically dispersed across seven continents, the Army's personnel community is developing new tools that will ensure the right Soldiers with the right skill sets are assigned to the proper units in a timely manner to ensure combat readiness. Enhanced personnel databases, leveraging web-based technologies, and implementing best business practices are examples of how the Army intends to improve the management of its military and civilian personnel. The increased operational demands have also required a reexamination of many longstanding personnel and basing practices, with the result being that the Army is transitioning to an improved manning system designed to improve unit readiness by increasing stability and predictability for unit commanders, Soldiers, and families. This will place greater emphasis on building and sustaining cohesive, deployable combat-ready units.

Modernizing the Army with new systems and equipment is a critical undertaking that consumes vital and limited resources. Only by ensuring that equipment fielding is integrated and synchronized with total requirements can the Army be assured that resources are being used in a wise and cost-effective manner. The annexes attached to the *2004 Army Modernization Plan* provide a comprehensive and succinct review of the progress being made in modernizing across the DOTMLPF as the Army continuously transforms itself from the Current to the Future Force.

Modernization Priorities

To achieve balanced readiness of the force over time, the Army prioritizes its investment of limited resources. From a requirements perspective, priority is to maintain and improve the readiness of the Current Force, including fielding the capabilities of the Stryker Brigades and inserting new technologies into existing systems, and then to modernizing into future formations. From a resourcing perspective, however, while the Army is committed to preserving the essential warfighting capabilities of the Current Force, it will also devote significant funding toward transformation initiatives that serve as the foundation of the Future Force yet also have applicability to the Current Force. A key component to preserving these warfighting capabilities will be achieved through the fielding of SBCTs. The number one priority for Army modernization investments is the development of the Future Force and particularly the FCS, the foundation of the future transformed Army. Initially that investment takes the form of S&T efforts to explore, identify, and develop the revolutionary technologies needed to make the FCS a reality. Of the Army's total S&T funding in the FYDP, 97 percent directly supports programs needed to develop Future Force technologies. In addition to these S&T efforts, the Army is devoting a substantial and increasing amount of its RDA funding to fielding systems that will be fully integrated in the Future Force. Overall, maintaining effective interoperability between systems in the Current Force—including the SBCTs—and in the Future Force will be a critical component of the Army's modernization plan. To accomplish this, sufficient resources will be applied to those activities that improve acquisition of interoperable capabilities across the force (e.g., areas such as architectures, training, C4 and ISR integration, and Software Blocking).

Developing and fielding the Future Force is the Army's modernization investment priority, and 59 percent of RDA funding in the FYDP supports this purpose. Included as a subset within this investment, fully 20 percent of overall RDA is directly earmarked for the FCS. Approximately 37 percent of total RDA is earmarked for the Current Force, with about 4 percent of RDA for Army infrastructure investments. The preponderance of funding focused on the Future Force will continue to increase over time as the Army progresses in the transformation process.

The focus on the Future Force is, in fact, enabled by the Army's continued investment in the readiness and capability of the Current Force. When the Future Force units are fielded and become operationally capable, beginning in 2010, the change in investments will accentuate this shift even further. In recent years, the Army has begun a paradigm shift in its investments toward an increasing emphasis on identifying and fielding leap-ahead technologies needed for the future. This shift will continue in the coming years, though the Army also intends to simultaneously insert many of the technological improvements into the Current Force as soon as feasible to capture the benefits and improve near-term capabilities required for current operational readiness.

To accelerate the transformation to the Future Force, the Army has accepted some risk by focusing its modernization efforts on selected units and capabilities. A key example of this focus is the modernization of Army Special Operations Forces, which because of their unique asymmetrical nature and essential role in the global war on terrorism and other contingencies warrant particular priority and technological improvement. These forces will continue to leverage the Army's developing technology as well as make available their own unique technological advancements to conventional Army forces. In addition to these forces, the Army also plans to insert technological improvements into other Current Force units that have an important role in maintaining operational readiness.

Enabling Process and Tools

There is an important process that is integral to the execution of the Army's modernization strategy—Unit Set Fielding (USF). In addition to this process, the Army uses an important acquisition policy and process called Software Blocking to implement USF by integrating and synchronizing system software developments and upgrades. The Army also makes extensive use of modeling and simulation as well as of studies and analyses to help establish priorities and make informed choices throughout the transformation process. Collectively, all of these tools are integral to the success of transformation and an effective and efficient modernization strategy.

Unit Set Fielding (USF)

Under traditional fielding processes, units were modernized by receiving multiple and separate issuances of individual systems throughout the year. This modernization approach, however, rarely provided the unit with a complete and fully integrated operational capability. It also proved to be disruptive to unit training and readiness. The single system/single unit focus of traditional Total Package Fielding (TPF) does not support the scope of facility, installation, training complex, and training center modernization required for fielding integrated new capabilities to units.

A more disciplined and structured modernization approach was needed. The Army established the USF process in 2001.

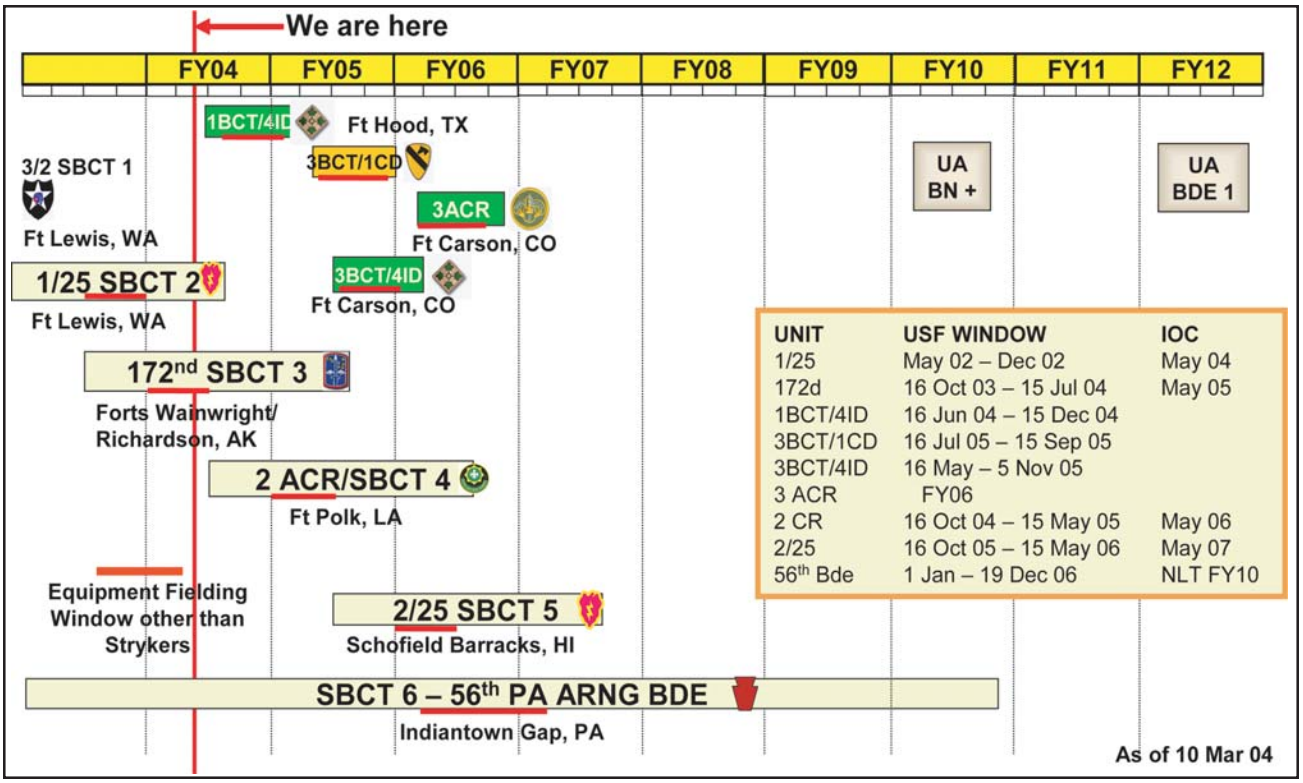

Figure 20. Unit Set Fielding (USF) Equipment Fielding Schedule

This process expanded on the single system modernization policies and procedures by focusing on building a unit combat capability package of equipment. USF integrates and synchronizes resourcing, planning, preparation and fielding of the package to a designated unit during a single modernization window. The designated unit is usually a brigade combat team.

Optimum success in fielding the capability package is gained by integration of all DOTMLPF activities required to develop, field, and support the individual systems that comprise unit sets. This holistic modernization approach is crucial to transforming the Army.

USF is currently being executed to modernize the 1st Cavalry Division, the 1st Brigade, 25th Infantry Division (SBCT 2), and the 172nd Infantry Brigade (SBCT 3). USF will be used to field the remaining four SBCTs as well as other selected light and heavy forces. The Army is also developing a comprehensive USF strategy for the Future Force. The first FCS-enabled UA, scheduled for an initial operational capability (IOC) in FY10, will use the USF process to field system-of-systems (SoS) capabilities.

Software Blocking (SWB)

SWB is an acquisition policy and disciplined process through which the Army achieves and sustains an integrated SoS warfighting capability. SWB is a critical enabler of USF.

SWB as an acquisition process improvement is consistent with the Clinger-Cohen Act of 1996 and DOD 5000. The framework embodied in the SWB policy synchronizes system software developments and upgrades. It is designed to focus the acquisition process on a disciplined approach for achieving interoperability, commonality, and synergistic functionality. In

conjunction with USF, SWB is a conduit for executing the Army's transformation.

Under SWB, the Army is making a commitment to divest itself of its traditional systems-centric approach to embrace a SoS capability that supports each element of DOTMLPF. This will allow the Army to make smart decisions based on the impact to warfighting capability vice systems. Under the policy, systems include new/upgraded core battlefield systems, trainers, stimulators, test and instrumentation, and simulators needed to achieve an integrated capability across all elements of DOTMLPF. SWB applies to all Army systems except those business systems that do not exchange information with tactical C4 and ISR systems and weapon systems.

SWB represents a necessary evolution along the path of acquisition reform. SWB lowers the artificial barrier between elements within the acquisition process that inhibit our ability to develop, test, train, and sustain a synergistic warfighting capability. Through SWB the acquisition process focuses on a total warfighting capability rather than individual systems.

SWB is a Future Force process that is being implemented to enhance the Current Force operational capability. This means it will take a few iterations before SWB is fully matured. Thus, SWB provides the paradigm through which existing systems will transition from their stovepipe implementations in support of Army objectives to provide enhanced capabilities to the Joint Force.

Joint Venture 2020 requires the insertion of innovations in information technology. SWB provides the vehicle for tuning the Army's acquisition efforts towards developing the interdependent application necessary to achieve the SoS warfighting capability essential to Force Application, Protection, Focused Logistics, Command and Control, and Battlespace Awareness. SWB ensures that the critical C4 and ISR, weapon systems, and SoS network infrastructure are matured in a manner that enhances overall operational warfighting capability while at the same time maximizing the operational effectiveness of individual systems. In a resource-constrained environment, priorities are targeted at maximizing total capability. For SWB, this will require a sustainment of resources from requirements through fielding.

Studies and Analysis

The Army's transformation must successfully structure, organize, and equip the Army for the challenges of the 21st century. This is an ambitious goal, and it will not be achieved without well-analyzed investments, in both financial and intellectual terms. Managing the transformation process to produce an Army that is highly effective in joint warfighting will require continuous analysis to develop DOTMLPF solutions that offer the warfighter the greatest capability. Robust analyses and studies support timely and correct decisions; increase the correlation of requirements for strategic, operational, and tactical conditions; expand technology trade space; permit the effective utilization of past modernization investments; and maximize effective system integration within the Army's SoS framework. Army analytical efforts will provide significant assistance in the materiel development and selection process by balancing risk between schedule, performance, and affordability. These analytical efforts will also identify specific modernization and recapitalization initiatives required to sustain Current Force superiority within acceptable risk while the Army focuses resources on enabling the Future Force. Army analytical capabilities support development of an effective modernization program that

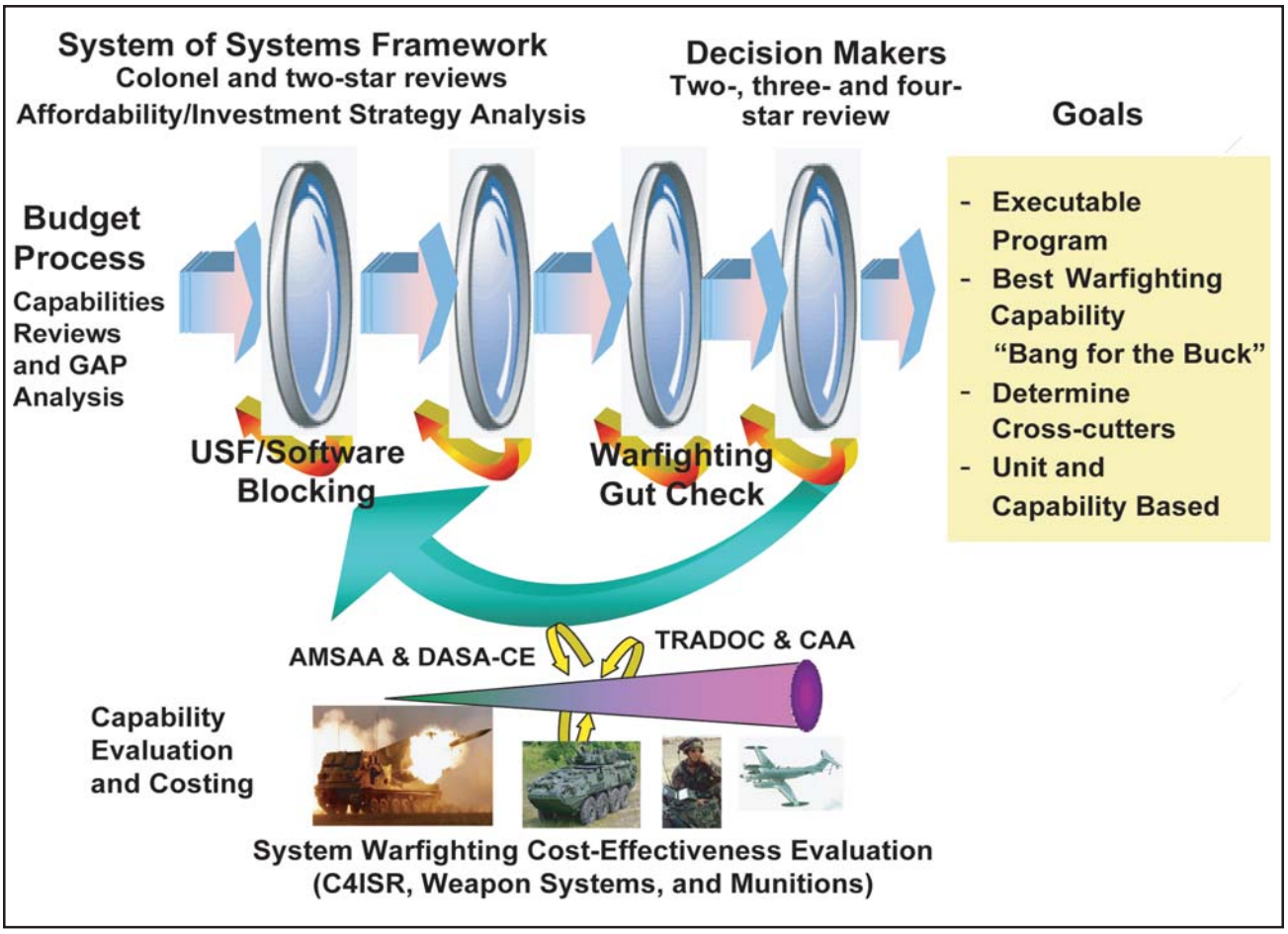

Figure 21. Investment Assessment Process

balances costs, technology, and warfighting needs for Current and Future Forces.

Although the Army uses a variety of analyses and studies to support its decision makers, the tools described below represent the most commonly employed. These samples include: the System-of-Systems Framework (SSF), Warfighting Alternative Analysis Requirements and Resources (WA2R2), Warfighting Lens Analysis (WFLA), Continuous Early Validation (CEaVa), and Value Added Analysis (VAA).

The System of Systems Framework is an institutionalized process, synchronized with the budget planning process, to provide insights to the Army leadership for resource decisions, and to support/refute external studies. The Army conducts analysis and studies in order to determine the optimum mix of systems that will allow us to build and maintain multifunctional, combat-capable units within an SSF. Analysis allows the Army to balance risk between schedule, performance, and affordability within and across Joint Mission Areas (JMA). Effects-based objective analysis provides a rigorous, quantitative, holistic approach to system acquisition. The Army uses the results of studies to support the development of systems and to defend Army programs during budget development and defense reviews.

Warfighting Alternative Analysis Requirements and Resources. The Army requires analysis to review warfighting requirements for the Army during transformation with a view towards the potential

impacts on required capabilities due to resource reallocation. WA2R2 provides an updated assessment of the Army's warfighting requirements, integrated capabilities and value-added in the future. The analysis provides insights and an analytical underpinning for building systems and munitions requirements into future programmatic reviews and defending Army requirements. WA2R2 gives the senior Army leadership options that constitute the best mix of cost-effectiveness, operational effectiveness and minimized risk, and identifies those cross-cutting systems that best integrate to achieve decisive victory.

Warfighting Lens Analysis is an analytically based process by which warfighter recommendations on the Army's battlefield capabilities are incorporated into the Army's budget planning process. It prioritizes weapon and training systems requirements, and the material solutions that best fulfill those requirements, to ensure warfighting overmatch capability within available resources.

Continuous Early Validation is a decision support system that will aid decision makers and analysts in evaluating acquisition programs by providing timely visibility on the status and issues of a program. CEaVa will stabilize the problem statement by validating key performance parameters or critical requirements relative to the ever-changing environment. CEaVa makes it clear that the user and developer are solving the right problem. Additionally, it increases the likelihood of producing the correct system on time. CEaVa is a tool that will aid the Army in conducting assessments of procurement programs.

Value Added Analysis provides decision makers an analytical approach for the evaluation and prioritization of competing alternatives to support the development of a balanced and effective Army RDA program. The study identifies and analyzes costs and benefits of weapon systems and develops feasible, affordable modernization investment strategies in support of the Army program planning. The objectives are to produce investment strategies for major weapon systems that maximize force effectiveness subject to constraints on budget, force structure, and production capabilities and to develop a quick reaction analysis tool to address modernization questions during program execution.

Modeling and Simulation (M&S)

Modeling and simulation is a horizontal and vertical integration mechanism that crosses most Army functional areas and lines of operation. The Army, as the Joint Force lead for land warfare, uses M&S to influence both the Current and Future Forces for spiral development, resource decisions, and operational and institutional support. A joint, interagency, multinational role for M&S is essential in the areas of training, test and evaluation, military operations, concepts and requirements, and in research, development and acquisition. The DOD analytical framework is based on a top-down, capabilities-based approach to requirements called Joint Capabilities Integration and Development System (JCIDS). This top-down approach to force planning 15-20 years in the future utilizes concept development and experimentation to derive desired joint capability for acquisition. Land warfare M&S requirements are therefore linked to joint or Office of the Secretary of Defense (OSD) requirements.

Current operations and lessons learned are shaping emerging simulation tools, environments, and training systems. This

drives a requirement for the Army to keep its M&S current and relevant. M&S must use databases that are compatible and integrated with Army command and control systems. Investments in data standards, common geospatial terrain, collaborative environments, space representations, test environments, command and control, and urban combat representations are essential. Investments in these areas, such as those to develop and provide common geospatial terrain, will enhance Soldier training and combat preparation by providing simulation and training systems integrated directly into operational systems, support course-of-action analyses and rapid decision making, and prepare Soldiers to fight in unfamiliar, fast-paced, dynamic environments.

Advanced simulation and virtual reality investments will enable the development of future urban combat training centers for asymmetric warfare, unconventional operations, joint exercises and experimentation. S&T investments in M&S support and shape Defense Transformation. The Army's current investment objectives are to demonstrate training and leader development M&S technologies. Key technologies include simulation software, decision aids, architectures for immersive environments, and algorithms for live, virtual, and constructive (LVC) simulation environments. The synergies of these technologies will enable training environments to create adaptive, high-performing leaders and Soldiers. This has already resulted in operational payoffs such as battlefield course of action analysis tools for more informed decision making.

Today, Army organizations are improving their analytic, development, test, collaboration, and training M&S. Joint and Army analytic organizations are using modern data, algorithms, software, and experimentation techniques to map the Future Force. The Army Research, Development, and Engineering (RDE) Command is using sophisticated M&S techniques and technologies to experiment and develop new technologies. Combat readiness is enhanced though training and mission rehearsals using constructive and virtual simulators and simulations, many of which are linked through distributive interactive simulations. The benefit to the Army is improved combat readiness posture, insight into various courses of action, and reduced weapon systems cost, performance, and/or schedule risk.

The Army is integrating its M&S capabilities within the Army architecture and applied to the Global Information Grid (GIG), its enterprise services, and supporting infrastructure. M&S infrastructure is the foundation to develop, use, and maintain this robust M&S capability. Infrastructure includes the basic facilities, equipment, installations, and services needed for the development and maintenance of a system. It also includes collaborative environments, personnel performing development or maintenance, communications, networks, architectures, standards, protocols, analyses, and information resource repositories.

The Army is continuing development of a collaborative environment to utilize the tremendous M&S capabilities within the Army RDE Command. The Modeling Architecture for Test, Research, and Experimentation (MATREX) will provide robust, networked, LVC simulation environments that will revolutionize the way the Army develops and acquires its weapon systems. MATREX is being used to focus research on modeling the C4 and ISR network, use of M&S in test and evaluation (T&E), and reducing cost and time to field new weapons systems. MATREX will provide

insight into technology required for comprehensive and systematic joint training systems needed for joint, interagency, and multinational operations. The expected payoffs of these M&S investments are the development of tools and techniques for rapid force modernization, to effectively prepare Soldiers and units for combat, and to provide technology for a seamless integrated LVC simulation in a joint, interagency, and multinational environment.

Emerging simulation tools and embedded training systems are using databases compatible and integrated within Army command and control systems. Investments, such as those to develop and provide common geospatial terrain, will enhance Soldier training and combat preparation by providing simulations and training systems integrated directly into operational systems, support course-of-action analyses and rapid decision making, and prepare Soldiers to fight in unfamiliar, fast-paced, dynamic environments. Integrated LVC environments will be the foundation for the Joint National Training Capability. Advanced simulation and virtual reality will enable the development of future urban combat training centers for asymmetric warfare and unconventional operations, joint exercises and experimentation. The Army will be able to leverage this new environment to facilitate development of new concepts, doctrine, force structure, tactics, and operations.

Collaborative environments are enduring or persistent collections of subject matter experts supported by interoperable tools and data bases, authoritative information resources, and product/process models that are focused on a common domain or set of problems. The Army is using collaborative environment concepts to develop the FCS under the Simulation and Modeling for Acquisition, Requirements and Training (SMART) Concept. SMART capitalizes on M&S tools and technologies to address system development, operational readiness, and life-cycle cost and is accomplished through the collaborative efforts of the requirements, training and operations, and acquisition communities. The Future Combat System Advanced Collaborative Environment (FCS ACE) is one of the first collaborative environments to apply SMART within a major acquisition program.

For broad concept development and experimentation, the Army's Training and Doctrine Command (TRADOC) is networking its M&S as part of the Battle Lab Collaborative Simulation Environment (BLCSE). BLCSE enables experimentation in a persistent, distributed, linked environment with common data to reduce travel and facility costs while offering expanded opportunities, both in terms of frequency and additional player participation. Expanded frequency and participation facilitates rapid parallel development of subordinate and functional concepts at the TRADOC centers and schools, within the TRADOC battle labs, and with other commands and environments. Likewise, embedded collaborative testing (digital and live) in TRADOC and the Army Test and Evaluation Command ensures efficiencies by eliminating the need for redundant or repeated testing.

Developing and preparing land forces for future military operations is a core competency of the institutional Army. Beginning with an overall vision and strategic guidance that are informed by operational experience, DOTMLPF analyses conducted by analyses organizations serve to develop operational and functional concepts. The results of analyses provide insights for force employment in military operations at all levels and combat intensities, current and future, across the spectrum of conflict and peacetime engagement, but in the context of joint, interagency, and multinational operations. Other

types of analyses are warfighting experiments; analysis of alternatives studies; personnel, equipment and ammunition requirement determination; doctrine and concept development; force modernization alternative evaluation; manpower and resource management program design; potential threat estimation; and planning for mobilization, deployment and sustainment of improved mobile and flexible forces to meet those threats.

The future is optimistic. Many of the major challenges of synchronization, integration, and resource optimization will be overcome in the next decade with careful planning, investment and implementation. The next generation of Army personnel who use M&S will be raised in a culture that is computer savvy and will be comfortable in simulation-immersed environments. Thus, the issues will not be in teaching the value of using M&S tools and techniques, but in keeping up with the demand. It is vital for the Army to recognize these demands and invest for the future.

Munitions Transformation Strategy

As a result of new technologies, munitions are becoming more capable across the full spectrum of operational scenarios. Munitions can no longer be viewed as a commodity, but need to be seen as an integral part of the Army's weapon systems capabilities. From close-in fights to deep strikes, munitions must be responsive, effective and supportable. Additionally, from a life-cycle standpoint, they must be producible, trainable and maintainable. The cradle-to-grave process the Army uses to develop, procure, store, manage, and dispose of munitions, therefore, needs to be modernized. Technologies exist and are evolving to provide munitions with dramatic increases in range, lethality, accuracy, and reliability. Decreases in size and weight resulting in scalable lethality, target discrimination, and interchangeable components will reduce the number and types of munitions needed.

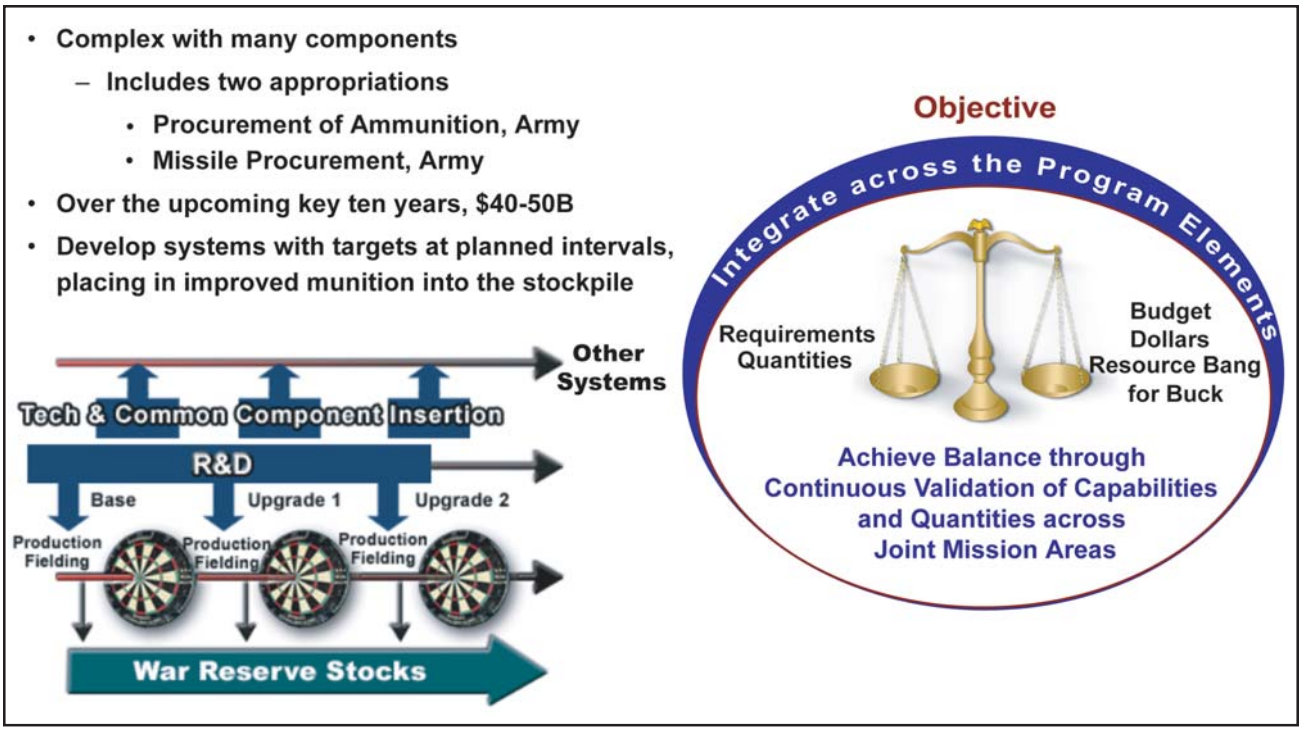

Figure 22. Munitions Transformation

Munitions will be responsive through the full operational depth of the battle area. Fires from LOS, BLOS and NLOS will provide both suppressive and precision fires. Additionally, these fires will provide variable effects, from destruction to nonlethal (NL) incapacitation. Scalable warheads and smart components will contribute to eliminating fratricide and minimizing collateral damage to noncombatants. Embedded training technologies, which can be used both in the field and in synthetic training environments, will reduce reliance on live-fire training of expensive munitions to achieve *2004 Army Modernization Plan* competency. Finally, munitions will be joint, both operationally and logistically.

The challenge is to identify critical needs and not pursue all promises that technology offers. To truly transform munitions, a synchronized effort between the Army and industry is essential. Common and modular design of components, block upgrades, and recapitalization programs are crucial to the munitions life-cycle strategy. Innovative packaging concepts will decrease the logistics footprint and improve system availability (better protection, easier handling and less wastage). Embedded diagnostics and prognostics will ensure better storage management and timely delivery, lessening the logistics burden. Design decisions must address training needs as well as second and third order effects on stockpile management and demilitarization. Production facilities will require upgrade and reconfiguration to account for new technologies and to satisfy increasingly stringent environmental and safety standards. Environmentally compliant ammunition and "insensitive munitions" requirements are realities. Demilitarization will become less necessary, as advanced munitions designs and conversions for training reduce this burden on the life cycle.

As with all elements of the Army's transformation process, limited resources drive decisions and strategies. The Army has already begun to include these key elements into requirements documents for new munitions, and this effort needs to be continued and expanded. Munitions to support current readiness must continue to be procured with modest efforts to maintain and upgrade current stocks. Existing stocks must also receive adequate stockpile management and surveillance resources to protect past investments. Munitions production facilities also deserve focused attention to integrate new production technologies and satisfy environmental and safety standards. The competing needs of modernization, readiness, and current operations necessitate a balanced approach to resourcing. An effort is underway to develop a munitions investment strategy and methodology to address core munitions issues to enable the resource process. The cornerstone of this assessment will be clear definition of munitions requirements that will involve a review of unit basic load computations and a rebaselining of the quantitative war reserve requirements for munitions process. This effort will define maximum risk levels—core essential munitions levels to best meet strategic, operational and training requirements.

Nonlethal (NL) Munitions

The challenges of both current and future operational environments have caused the Army to recognize the need for NL effects. The strategy for the NL effort is integrated at Department of the Army level with other Service efforts as well as the Joint Nonlethal Weapons Program Integrated Product Team. Specifically, the Army expects that its NL analysis could provide more detailed insights in the following areas:

- Potential delivery means: including LOS (including Soldier-delivered NL), NLOS, and BLOS.

- Battlefield applications: incapacitate, suppress, and disperse combatants and/or separate combatants from noncombatants. Deny vehicle movement or trafficability.

- Environmental impacts: alter environmental conditions to favor friendly forces and, once use of NL has accomplished its objectives, safely restore the environment to its previous condition.

- Overall, NL munitions provide unique capabilities across a wide spectrum of missions and will be applicable to the Future Force and the FCS. The Army will also seek to incorporate them in Current Force munitions as much as practicable.

Investment Strategy

The ultimate goal of Army modernization is to build and maintain multifunctional, combat-capable units using a USF approach. The nature of the planning, programming, and budgeting system requires that combat unit components be managed as single entities. It is the whole unit, however, that remains the primary focus. The objective is to achieve an operational capability that satisfies mission needs. The challenge inherent in building combat-capable units through the application of integrated components and the necessary associated functions is the achievement of synergism and complementary results in the units.

In the Army's investment strategy for PB05, the overriding requirement is to maintain the essential operational readiness of the Army. This imperative is the foundation of the Army's commitment to the nation, particularly at this time of wartime engagement, and it is likewise the essential enabler for being able to transform over time to a Future Force that is better able to meet future strategic requirements.

Second to the imperative of maintaining readiness, the Army in PB05 seeks to maintain and improve the well-being of its people. This is not a luxury, but rather is vital to the Army's overarching capabilities and ability to conduct all assigned missions.

Next, as part of its PB05 program, the Army seeks to accelerate the Army's transformation and those capabilities associated with the Future Force and insert them into the Current Force as much as possible. It is within the context of this effort that the Army's modernization strategy of balanced modernization guides investment decisions and relative priorities. With the emphasis on the achievement of the Future Force capabilities that will reduce future risk, coupled with the indispensable imperative of current operational readiness, the Army has chosen to make more focused modernization and recapitalization of its Current Force by inserting new technologies that become available as a result of transformation investments. This represents a slight readjustment, but is still consistent with the overall Army objective of maintaining readiness while still developing and fielding transformational capabilities in the future and today where possible.

The Future Force

The Army is developing a Future Force that will achieve the capabilities necessary to be a strategically responsive, precision maneuver force that is dominant across the range of military operations. This force is not a finite

end state as much as a path of continuous change for the future. It will be optimized for versatility and have more agility in order to dominate land operations in any future conflict. It will also be capable of transitioning from normal readiness to smaller scale contingencies or major combat operations. The Future Force will be equipped with significantly enhanced systems centered on the FCS, the networked system of systems made up of a family of manned and unmanned air and ground platforms, and ground-based maneuver, maneuver support and maneuver sustainment systems. Key enabling systems such as the Warfighter Information Network-Tactical (WIN-T), the Joint Tactical Radio System (JTRS), DCGS-A, and the Aerial Common Sensor (ACS) will also complement the overall capabilities that the Future Force will bring to the Joint Force. The Future Force will be designed to operate as part of a joint team, and its joint operational architecture will provide an enhanced C4 and ISR for dominant situational awareness and precision strike. Through the spiral development process, emerging capabilities from Future Force programs will be inserted into selected components of the Current Force, thus providing force modernization with a minimum impact on operational readiness. This will necessitate that the FCS and other enabling programs remain sufficiently affordable and flexible in order that their emerging capabilities can be incorporated into the Current Force where possible.

S&T Priorities

The near-term priority is on maturing and demonstrating critical technologies for the Future Force, with major emphasis on the FCS. These technologies will provide the foundation for accelerated acquisition programs to meet the timetable of the Army Vision. Key areas of

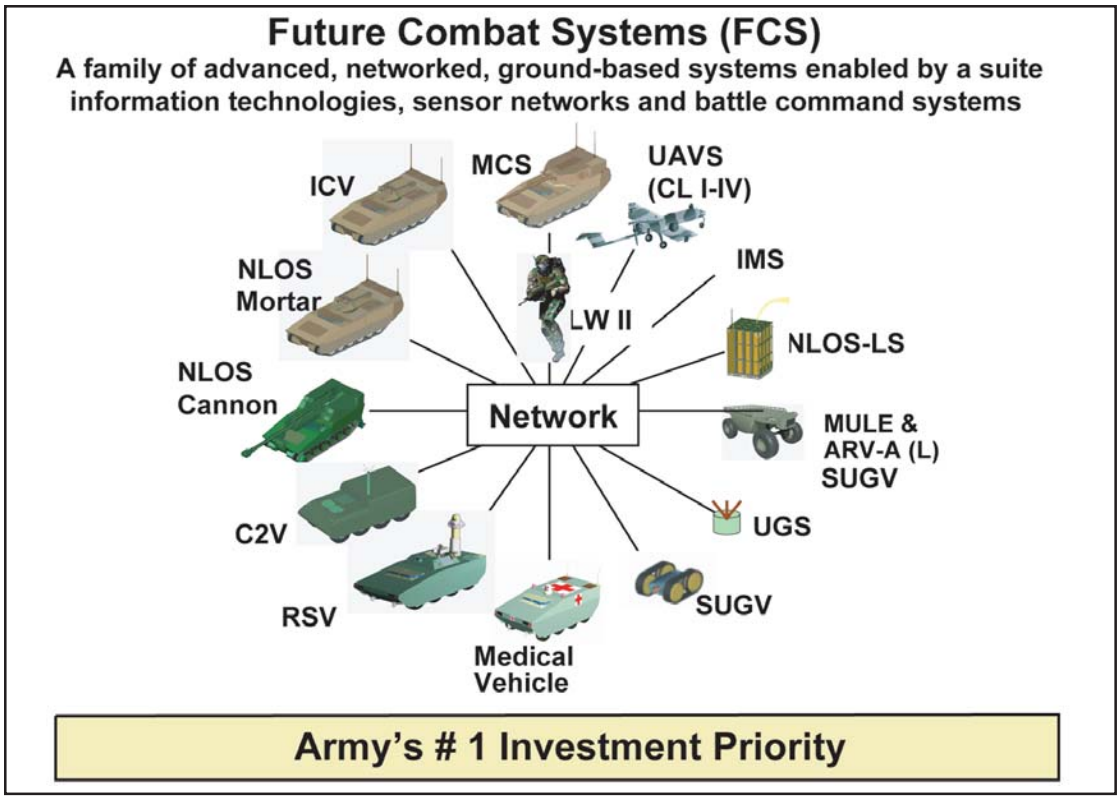

Figure 23. Future Combat Systems

investment include lethality, survivability, C4 and ISR, Soldier system of systems, semiautonomous air and ground robotic vehicles, human engineering, reduced logistical burden, Soldier training, counter-mine, and medical prevention and casualty care. Advanced technology development (6.3) provides mature technologies for rapid insertion into Army acquisition programs, whether they are new systems or product improvements.

The midterm focus is on developing and demonstrating incremental upgrades for the FCS and new capabilities for the Future Force. Investments that will provide transition products in the midterm are currently being made in applied research (6.2) programs, in leap-ahead areas such as next generation lethality (e.g., electromagnetic guns, directed energy), survivability (active protection systems), C2 on-the-move using autonomous sensor networks, advanced simulation, personnel technologies, and logistics demand reduction; this research includes the development of components, models, and new concepts through in-house and industry efforts.

In the far term, revolutionary new warfighting concepts will be enabled by increased Army investments in basic research (6.1). Basic research is the number two priority area for S&T investment. The products of current investments in areas such as nanoscience, biometrics, smart structures, advanced computing, and materials by design will enable significant enhancements that maintain technological overmatch in our land combat forces.

S&T Efforts

Army S&T is responding boldly to the challenges of a transforming Army. The S&T program consists of a dynamic portfolio of technology investments that is responsive to warfighter needs today and into the future. S&T seeks technological solutions that can be demonstrated in the near term, explores the feasibility of new concepts for the midterm, and seeks the imaginable for an uncertain far-term future.

FCS is the main thrust of the S&T program and represents 25 percent of all S&T investments. The balance of S&T is targeted to pursuing technologies that support the Future Force as a whole. Some of these technologies are highlighted below:

- **Future Combat Systems**. The most significant S&T initiative enabling the Future Force is the FCS program. The FCS is comprised of a family of advanced, networked, air- and ground-based maneuver, maneuver support, and maneuver sustainment systems that will include manned and unmanned platforms. The FCS is networked via a C4 and ISR architecture, including networked communications, sensors, battle command systems, training and both manned and unmanned reconnaissance and surveillance capabilities that will enable improved battlespace awareness and operations at a level of synchronization heretofore unavailable. The FCS will network systems under development, and new systems to be developed to meet the needs of the UA. The network will enable dramatically improved ISR, enhanced analytical tools, joint exchange of blue and red force tracking down to the tactical level, synchronized battle command, real-time sensor-to-shooter linkages, and increased synergy between echelons and within small tactical units. It will also enable the UA to connect to higher echelons, Army and joint, and national assets making these capabilities available to the small units of

the UA. The Army will be adhering to the seven key performance parameters during the developmental process of the FCS: joint interoperability, networked battle command, networked lethality, transportability, sustainability/reliability, training, and survivability. Representative enabling technologies include unmanned air and ground technologies; highly mobile lightweight ground vehicles with advanced survivability systems (e.g., active protection, lightweight armor, signature management, and countermine capability); hybrid-electric drive; low-power demand electronics and efficient power management; advanced lethality systems; and reliable, secure communications systems.

- **Objective Force Warrior (OFW)**. The flagship Soldier S&T program provides the UA's dismounted Soldier with the same combat overmatch that FCS brings to the maneuver portion of the Future Force. The program is a phased effort to achieve leap-ahead advances in the areas of Soldier survivability, lethality, and agility to operate for extended periods under arduous conditions, with minimal loss in physical capabilities from fatigue, stress, and hardship. The initial phase, the OFW Advanced Technology Demonstration, develops an integrated system-of-systems for the dismounted Soldier with FCS connectivity. OFW will employ open system architectures and high-risk/high-payoff technologies to yield an ultra-lightweight, stealthy combat suit and an integrated, network-centric communications/sensor/power suite that enables dismounted Soldiers to network and mass fires and generally access the power of the Future Force. It is through OFW that mounted/dismounted synchronization will occur. OFW will also allow the dismounted Soldier to greatly reduce his backpack by transloading functions to the platform. OFW funding has been increased to support rapid transition of mature technology components to the Land Warrior-Advanced Capability System Development and Demonstration (SDD). OFW Phase II efforts will develop and integrate emerging high-payoff technologies such as micro-turbines and nano-materials to further enhance Soldier capabilities.

- **C4 and ISR.** Research and technology to enable comprehensive and timely situational awareness tailored for the range of soldiers comprising the Future Force. This includes advanced ground-, air-, and space-based sensors and sensor processing, flexible size/shape display interface surfaces, disposable (cost-effective) miniature sensor networks, electronic warfare systems and techniques, militarized and special-purpose electronics, countermine technologies and sophisticated C4 computing technologies. Keys to this are on-the-move distributed C2, multifunction sensors and sensor fusion algorithms, and development of a seamless tactical Internet within and between units. Future Force systems such as DCGS will integrate these technologies into fused multidiscipline intelligence (multi-INT), be globally self-deployable and full-spectrum, and allow precision-targeting capabilities based on critical near real-time intelligence to the commander.

- **Basic Research**. Investments in the exploration of fundamental phenomena that have significant potential to enhance future land warfare capabilities in areas such as armor materials by design, nanoscience, biometrics, compact power, smart structures, miniature and multifunctional sensors and Soldier performance.

- **Medical**. Research and technology to protect and treat warfighters to ensure worldwide deployability (e.g., emergency room technology in a box), increase warfighter availability, and reduce casualties and loss of life by (1) developing and enhancing the biomedically protected Soldier, thereby increasing the Soldier's ability to operate effectively in the face of infectious, environmental, and chemical/biological threats; (2) enhancing Soldier stamina, enabling Soldiers to conduct sustained, high-tempo Future Force operations with minimal degradation; and (3) developing combat casualty care materiel for delayed evacuation, to provide optimal battlefield care to the injured.

- **Lethality**. Technologies to enhance the light forces, such as the Line-of-Sight Antitank (LOSAT) System and the Precision Guided Mortar Munitions (PGMM); and technologies to provide lethality options for the Future Force, such as the Compact Kinetic Energy Missile (CKEM), electromagnetic gun and tactical high-energy laser.

- **Rotorcraft**. Research and technology to enhance the performance and effectiveness of future rotorcraft, including autonomous flight and airborne launch systems, small rotorcraft, networked avionics and weapons, and human-systems integration (e.g., crew station) technologies. UAVs such as the Unmanned Combat Armed Rotorcraft (UCAR), Micro-Air Vehicle (MAV) and Organic Air Vehicle (OAV) will provide the warfighter enhanced situational awareness, force survivability and lethality by enabling air-to-air and air-to-ground teaming.

- **Logistics Demand Reduction**. Technologies to enhance deployability and reduce logistics demand, especially the demand on strategic lift. Examples include comprehensive, real-time asset visibility, providing the logistician a web-based portal into the entire end-to-end force projection process; high-altitude-capable, precision-guided airdrop distribution system; embedded water generation systems; and compressed meals (envisioned for use with the FCS). In addition, tri-generation equipment (power, heat, and environmental control unit (ECU)) will provide protection from the elements for our Soldiers and equipment while unmanned vertical takeoff and landing (VTOL) cargo lifters, embedded diagnostic/prognostic systems, and robotics will greatly enhance resupply and reduce demand for food, fuel, and water.

- **Personnel Technologies**. Advanced training tools and methods to enhance warfighter and commander abilities and performance, and advanced human engineering concepts to avoid information overload and optimize task allocation to enhance warfighting effectiveness.

- **Survivability**. Technologies that enable organizations, platforms and Soldiers to avoid being detected, acquired, hit, penetrated or killed. Examples are active-protection systems, lightweight armor, vehicle-mounted mine detection, and signature management.

- **Advanced Simulation**. Simulation tools to provide increasingly realistic environments and systems support acquisition, requirements and training. This includes technologies for networked simulations, embedded training, constructive simulations, virtual environments, and range systems for live use.

FCS and Complementary Systems

The FCS is the networked system of systems that serves as the core building block within modular maneuver echelons to provide the Joint Force with superior combat power, sustainability, agility, lethality, and versatility. The FCS leverages advanced technologies with the capability to rapidly incorporate future advances through deliberate technology insertion and integration programs. It provides a secure C4 and ISR system to incorporate advances in the distribution and effective use of information power as part of an overall network. The FCS consists of the network plus 18 manned and unmanned air and ground systems. A major step for the FCS was achieved in May 2003 with the successful approval of the Milestone B decision, which confirmed the feasibility of technology and initiated implementation of a coherent and integrated strategy to move toward an initial operational capability in 2010 and a full operational capability by 2012.

In spring 2003, the Army G-8 led an effort to identify, synchronize and approve the UA Complementary Systems, which is a group of systems beyond the FCS system of systems that is necessary for the UA to achieve its optimum operational capabilities. The purpose was to ensure the Complementary Systems are synchronized with the fielding of the FCS. The effort resulted in the approval of systems within the near term for continued priority development. The UE Complementary Systems are planned for similar synchronization in FY04.

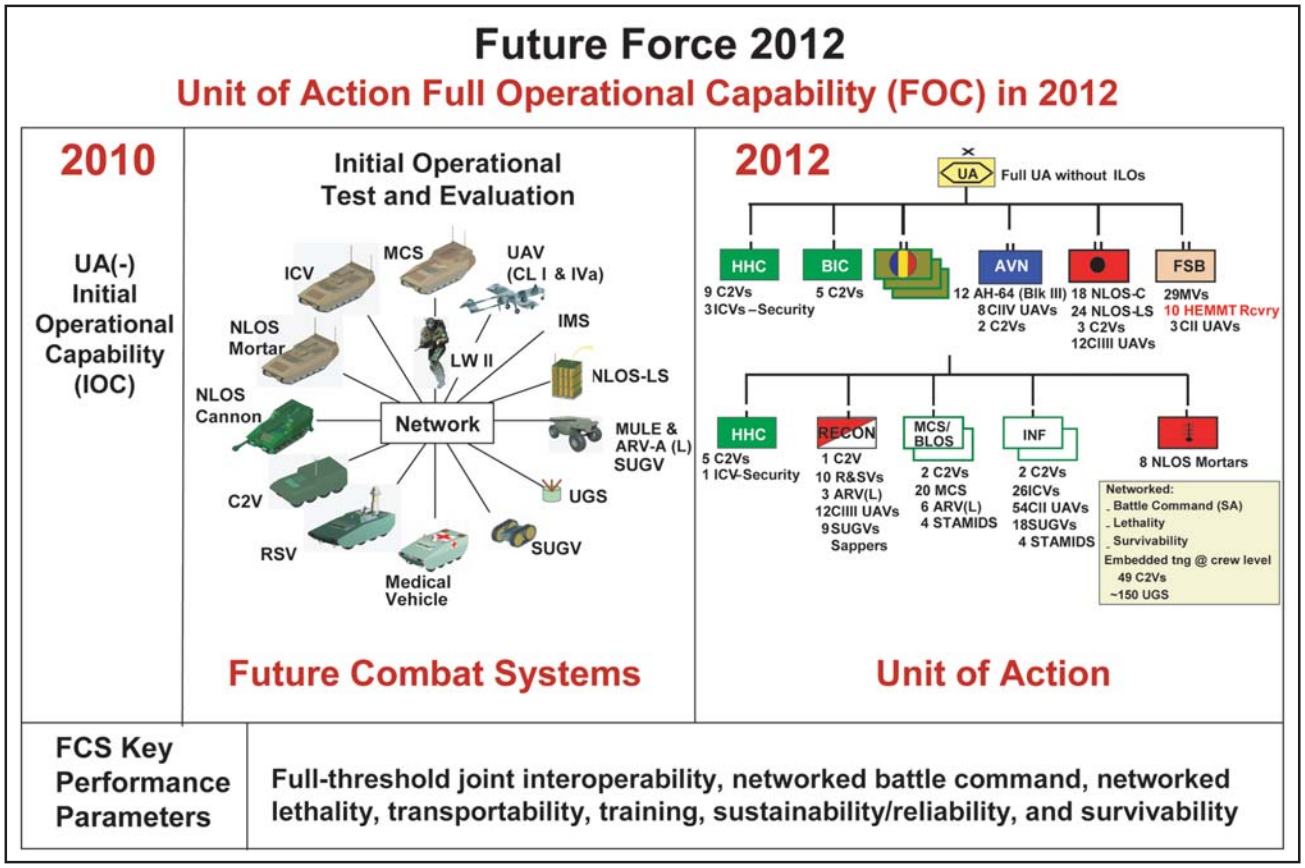

Figure 24. FCS Fielding Strategy

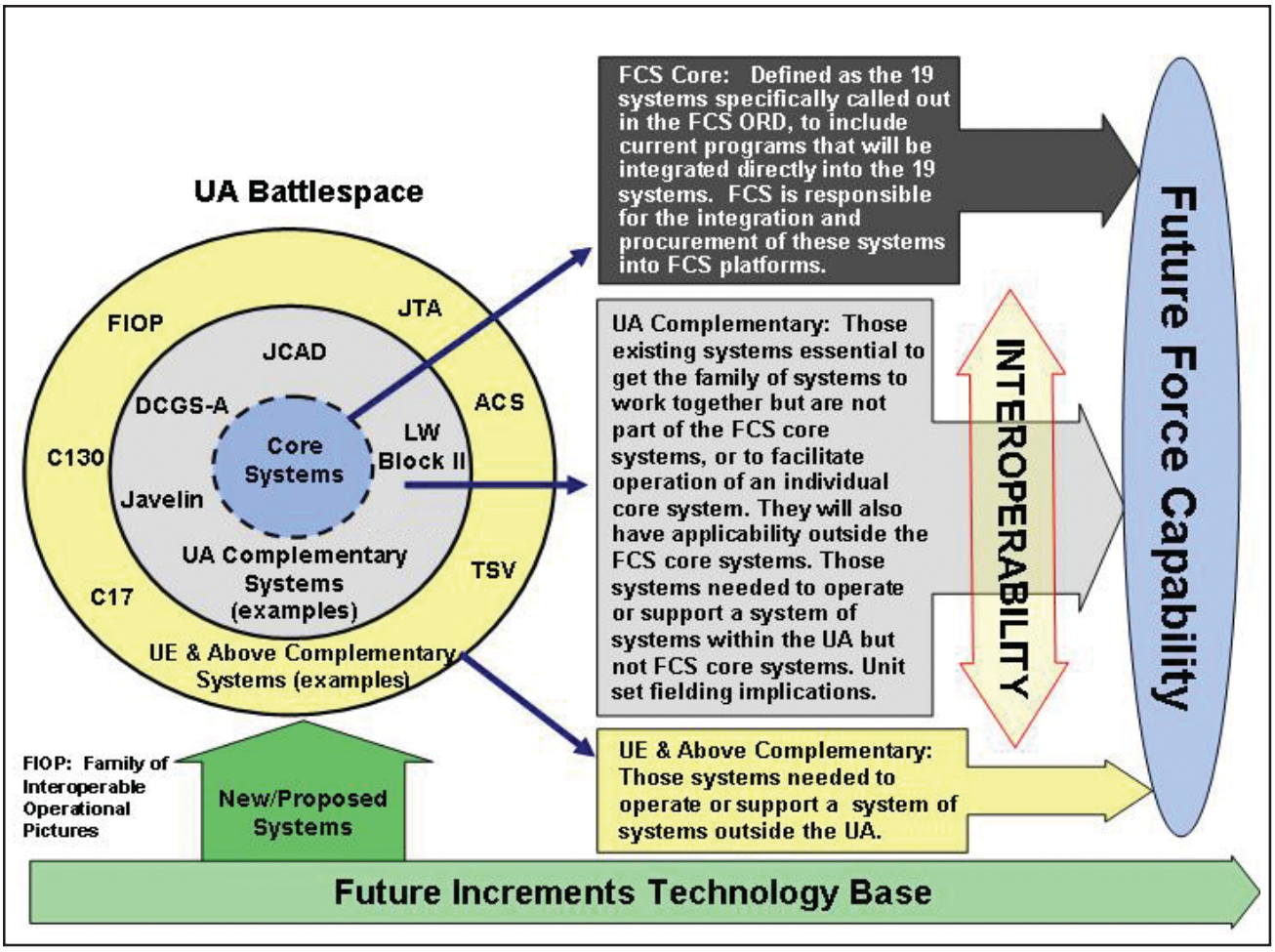

Figure 25. FCS Complementary Systems

PB05 Implementation

In PB04, the Army funded $11.3 billion in S&T investments, of which 97 percent was devoted to the Future Force. PB05 maintains this same level of investment, which is a clear indication that the Future Force continues to remain a high-priority Army goal. Further evidence of the intended support of Future Force development is a $3 billion increase provided in PB05 for the FCS and its Complementary Systems.

The Current Force

Today's Army—the Current Force—is heavily committed with over 325,000 Soldiers deployed in over 120 countries. It includes the existing heavy divisions, light divisions, Stryker Brigades, and Special Operations Forces. This force is the guarantor of both current warfighting readiness and the Army's ability to continue transforming towards the Future Force with enhanced capabilities. Because of these operational requirements, the Army is no longer able to accept the degree of risk to this force that was thought possible in the past. As a result, the Army is reexamining the requirements for new capabilities and enhanced readiness in the Current Force and weighing them against the need for resources to support transformation to the Future Force. To help preserve the operational readiness of the Current Force, the Army will continue with its program of selective recapitalization and modernization, which will also insert new

technologies to the greatest degree possible. These investments remain essential for both readiness and reducing the operating and support costs of aging systems.

The Stryker Brigades or SBCTs are a new component of the Current Force, with the first operational unit deployed to Iraq in fall 2003. These brigades—scheduled to be six in all—provide Combatant Commanders with increased responsiveness and tactical agility when properly augmented to meet the full range of operational requirements. These units will be infantry-centric and equipped with the latest in C4 and ISR capabilities to enhance their joint synergy and versatility. Along with other components of the Current Force, the SBCTs represent the foundation of the Army's contribution to the joint team in meeting the nation's security needs.

Equipping Initiatives

Recapitalization

Recapitalization is the rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a near zero-time/zero-mile system. The goals of recapitalization are to improve unit effectiveness and warfighting capability, extend service life, reduce operating and support cost, and improve reliability, safety and maintainability. When operationally necessary and financially prudent, the Army will recapitalize selected systems.

The Army's need to recapitalize its systems is significant, though this goal is clearly unaffordable given the current fiscal constraints and planning guidance. The Army, therefore, has decided to focus its resources on only those systems and units that are essential to maintaining today's warfighting readiness while taking risks with other systems and other parts of the force. To develop an affordable and executable recapitalization program, the Army has focused its resources on selected units within III Corps, taking risks in the Army's remaining units.

While the recapitalization program approval process has helped the Army focus its resources, reduce requirements and develop cost effective, funded programs, the Army must still remain aware of the inherent risk in this program. Even for prioritized systems, the Army still has significant unfunded requirements for systems that reside in other units beside III Corps. As a result of its recapitalization strategy, the Army has provided critical combat capability to portions of III Corps, accepted risk in its remaining units, and established a process that will help free up resources for the Future Force. The Army will continue to review the scope of its recapitalization efforts and make adjustments as appropriate.

Selected Modernization

The Army focuses its limited modernization efforts for the Current Force primarily on those systems that will benefit the warfighter today—particularly those incorporating newly developed technologies—but will also have direct applicability to the Future Force over the longer term. These systems are placed into two categories: those that are part of the near-term Current Force and will transition to the Future Force over time (e.g., the Family of Medium Tactical Vehicles (FMTV)) and those that are being built specifically for the Future Force, but which can be used today (e.g., Tactical Unmanned Aerial Vehicles (TUAV) and Highly Mobile Artillery System (HIMARS). By doing this, the Army is ensuring that its scarce resources are efficiently spent on systems that benefit it today as well as in the future.

Moreover, the Army is focusing its modernization efforts on inserting new technologies that have been recently developed and offer the prospect of enhancing near-term readiness of Current Force units.

The Army is reevaluating its past efforts to accept risk in the Current Force in order to accelerate transformation to the Future Force. Modernization efforts have been restricted to selected units and capabilities, with only two divisions and one armored cavalry regiment in III Corps, some XVIII Airborne Corps units, the SBCTs, and a limited number of other units, including SOF units, scheduled to receive upgrades and enhanced capabilities.

Responsive Modernization in Support of Operations

Besides these ongoing efforts for recapitalization and modernization, the Army has also made some significant adjustments in light of the recent and ongoing operations in Iraq. In support of the ongoing global war on terrorism, and particularly the operations in Iraq, the Army has taken aggressive steps to meet the materiel needs of our deployed forces. These have included diversions, cross-leveling and accelerated fielding of promising technologies to provide equipment to AC and RC units engaged in combat and stability operations and on the forefront of homeland defense. Some of the key fielding initiatives

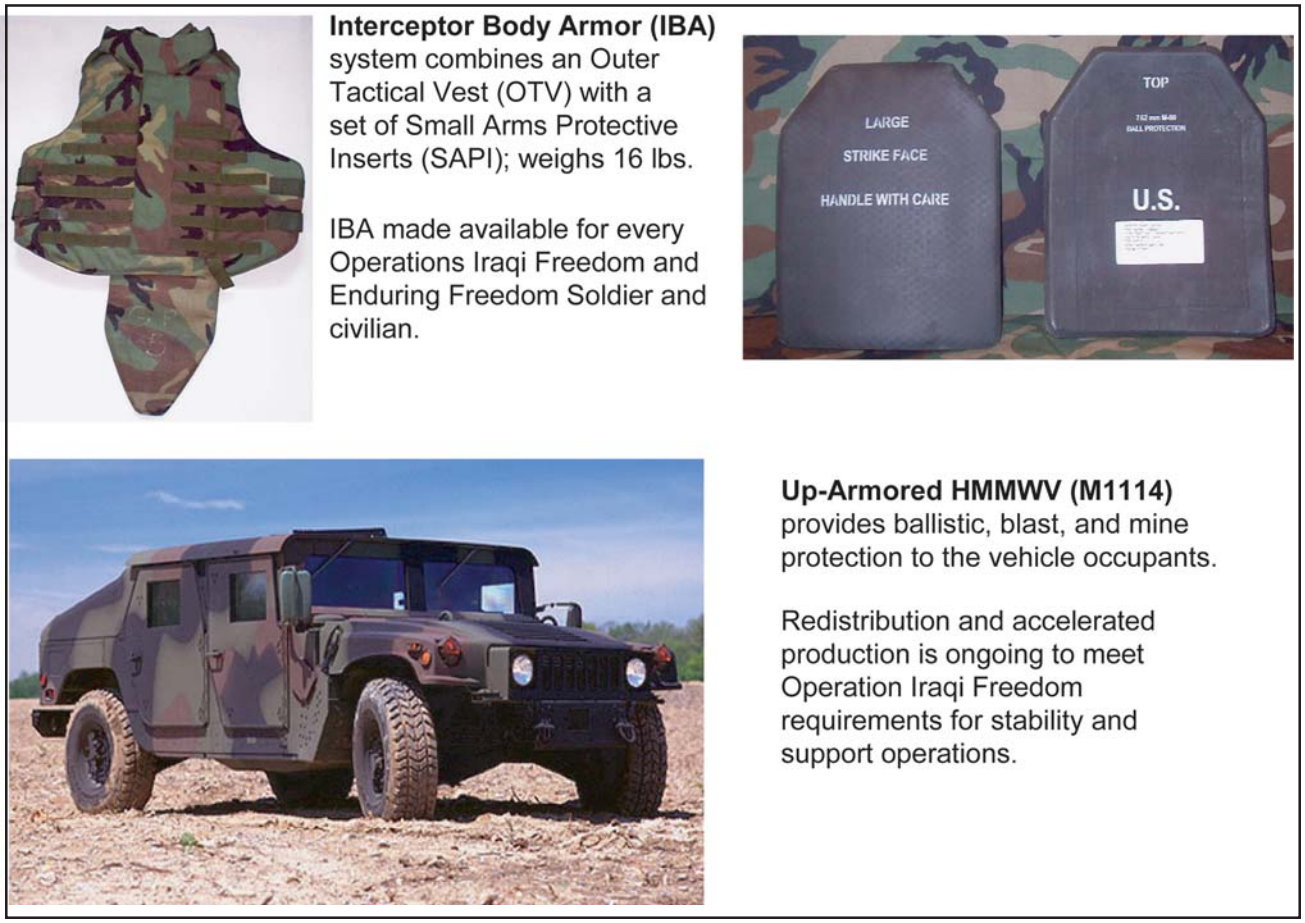

Figure 26. Interceptor Body Armor (IBA) and Up-Armored HMMWV (M1114)

involved significant enhancements to operational capabilities. A good example of this was the accelerated fielding of the Force XXI Battle Command Brigade and Below (FBCB2) system, which represented a major improvement in achieving situational awareness on the battlefield and enabling a clearer COP across the force. This system also enabled BFT and a new means of depicting friendly and enemy force locations and contributed to reducing friendly fire casualties. Other initiatives included the deployment of UAVS, up-armored High Mobility Multi-purpose Wheeled Vehicles (HMMWVs), and significantly improved body armor for individual Soldiers. In conjunction with this responsive approach to operational needs, the Army has developed a truck strategy that assesses the current status of tactical wheeled vehicles and includes a coordinated plan of restoration, recapitalization and modernization efforts to support the Current Force as well as the Future Force. Related to supporting the Soldier, the Army has also recently instituted and employed a Rapid Fielding Initiative (RFI) as a process to streamline the provision and fielding of the latest state-of-the-art weapons, clothing and equipment to Soldiers in the field and to find solutions to identified operational requirements. In addition, the Army is institutionalizing a Rapid Equipping Force (REF) concept to improve current capabilities by accelerating the fielding and insertion of future technologies and capabilities.

Reset—Restoring Readiness and Improving Capabilities

In conjunction with the rotation of units from Operation Iraqi Freedom, the Army is in the process of "setting the force" or "reset" to restore and improve the operational readiness of the force. This process is particularly critical in light of the fact that deployed systems have been operating at five times normal tempo, prepositioned stocks are being significantly degraded, and a considerable number of major end items have been lost in combat operations. Reset includes a strategic assessment incorporating the lessons learned from Operations Iraqi Freedom and Enduring Freedom, the reconstitution of a long-term plan for stability and support operations and force rotations, and the reestablishment and restructuring of Army prepositioned stocks worldwide. This is both a necessity and an opportunity, and the purpose is to continue support of Combatant Commanders, return forces to prehostility readiness levels, and integrate reset into continued transformation, modernization and recapitalization. The standards established for reset include bringing all equipment to normal operational status and, where sensible, upgrading capabilities and implementing lessons learned from recent operations, replacing obsolete equipment in prepositioned stocks, and reconfiguring those stocks to be more strategically relevant and responsive. In addition, the Army plans to use this opportunity to reorganize units and implement the modularity objective identified in the Army Focus Areas. Support from Congress in the form of the FY03 and FY04 supplementals has been instrumental in initiating this essential process, and we will continue the efforts to fund this vital program in the future. These efforts will most likely include the requirement for additional funding in annual budget submissions as well as further support in new supplementals. The Army's Current Force readiness depends on the effective execution of reset, and it will be ongoing for the foreseeable future.

Equipping Stryker Brigades

The Army will maximize use of the USF concept to equip the SBCTs. Unit sets will be

determined through extensive coordination between the major command of the SBCT, the Army's Training and Doctrine Command (TRADOC), and the Office of the G-8, Headquarters, Department of the Army (HQDA). Each unit will be sequenced through a synchronized 18-month window, which not only involves the equipping of the unit but also New Equipment Training (NET) for individual Soldiers and unit collective training culminating in the achievement of operational readiness. As previously mentioned, the Army has already deployed the first Stryker Brigade to Iraq in an operational mission. The second SBCT is due to be operationally ready in 2004. For the third SBCT in Alaska, equipment issue and NET are ongoing, with operational availability projected for 2005.

PB05 Implementation

Congressional supplemental funding in FY04 has been used to offset the costs of operations in Iraq. This supplemental funding, however, does not fully reimburse the Army's costs for ongoing operations or the redeployment and reset of assets used in support of these operations. In addition, the Army has made a conscious decision to accelerate identified new capabilities being developed for the Future Force and insert them into the Current Force. The result of these actions is an ensuing need to rebalance risks and resources between the Current and Future Forces.

PB04 and the associated FYDP had decreased funding for the Current Force by approximately $22 billion to support transformation efforts. This action was funded by canceling or reducing a total of 48 systems. In PB05 additional reductions of this magnitude are not possible in light of increased operational demands on the Current Force. The majority of funding for the Current Force is still devoted to systems that are expected to remain in the force as it moves toward the Future Force over time. Overall, the Army has approximately $15 billion invested towards recapitalization of the Current Force to ensure readiness of selected Current Force systems. This is a prudent step needed for operational readiness today and in the future.

For the Stryker Brigades, PB05 and the associated FYDP provide $4.3 billion to fund the Stryker Armored Vehicle, SBCT support equipment, training enablers, sustainment enablers and infrastructure costs for all six brigades planned for fielding.

As a result of the tremendous demands being placed on the Army today, significant additional fiscal needs are expected in order to maintain and replace key systems and stocks and ensure the readiness of the Current Force for ongoing and planned operational rotations. To achieve this, the Army will seek flexibility within PB05 and support from future appropriations to manage the risks associated with changing requirements for an Army at war and building for the future.

Summary and Conclusion

The Army today is both fully engaged at war and simultaneously committed to a continuous process of change. The Army's transformation is an integral part of current Army planning and operations, and strong momentum has already been achieved as a result of past decisions as well as the commitment and effort of Soldiers and civilians in all Army components. New capabilities have been fielded and deployed that give the President, Secretary of Defense, and Combatant Commanders a greater array of network-centric land power options. Campaign-quality Army forces possessing an increased joint and expeditionary capabilities are the objective of the Army's ongoing and future efforts, and the Army fully intends to provide an even more relevant and ready land force for use as part of the joint team.

The *2004 Army Modernization Plan* reviews the Army's strategy of building and fielding combat-capable units that will maintain and enhance the capabilities of the Current Force—today's Army—and develop even more improved capabilities for the continuously evolving Future Force. Accelerated efforts are underway for incorporating the opportunities offered by these revolutionary technologies into new systems and units and also inserting them into current systems and units if possible. Visible results of transformation efforts have already been seen in Iraq, where the first SBCT was deployed in fall 2003. This new organization will also serve as an important link to force development in the future. The *2004 Army Modernization Plan* identifies the requirements and the plans for fielding these important new capabilities.

The *2004 Army Modernization Plan* describes the overall modernization strategy as well as the key processes that will facilitate the building of combat-capable units. While the materiel aspects of modernizing and transforming the Army are a central theme of the *2004 Army Modernization Plan*, it is essential that modernization be fully coordinated, balanced, and synchronized across the critical requirements of doctrine, organizations, training, leadership and education, personnel, and facilities. Respective annexes are devoted to specific discussions of these essential areas. Above all else, people remain central to the success of the Army's transformation, and Soldiers are the true credentials of the Army—today and tomorrow—just as they have been throughout our nation's history.

The Army, with the strong support of Congress and OSD, has made significant progress in the constantly evolving transformation process. In last year's budget, the Army made some difficult decisions to accelerate development of future capabilities, which entailed a higher level of risk to the Current Force. These risks, however, have had to be reassessed continually in light of the increased operational requirements associated with the global war on terrorism and particularly the impact of Operation Iraqi Freedom. With over 325,000 Soldiers deployed overseas, including as many as 125,000 in Iraq, the Army has had to reexamine the balance of risks between the Current Force and the evolving Future Force. Congressional supplemental funding in FY04 has helped significantly in offsetting the costs of operational requirements, though the remaining risk to current readiness and the desire to accelerate the development of new capabilities that can be applied today has

created a serious resource constraint and has led to further rebalancing of investments.

In addition to the necessary rebalancing of investments, the Army still has outstanding requirements to support reconstitution and recapitalization demands from the ongoing operations. Furthermore, the significant restructuring process already underway will require continued and additional support in order to achieve its goals of increased capabilities for the war effort.

The *2004 Army Modernization Plan* is submitted in conjunction with the release to Congress of PB05, which continues to implement transformational change while also preserving and enhancing readiness today. Specifically the Army's portion of the PB05 submission provides funding for the following:

- Maintains essential emphasis on the overall readiness of the Current Force by devoting approximately $15 billion to the recapitalization of systems in this force and by supporting efforts to restore full readiness for future missions for those units involved in recent operations

- Fully funds fielding of six SBCTs by 2008

- Supports essential rebalancing of AC and RC units by transferring selected capability from the RC to the AC and activating high-demand RC units

- Accelerates development and fielding of transformational capabilities and specifically the FCS and Complementary Systems by providing an additional $3 billion

- Focuses S&T investment of approximately $11 billion over the FYDP in the development of transformational capabilities primarily applicable to the Future Force, though with potential application to Current Force units and systems.

The Army remains committed to investing in the future through development of significant improvements in capabilities that can be applied to the evolving force. Yet, the priority commitment is to the warfighting readiness of today's Army and the incorporation of enhanced capabilities through the introduction of new modular structures and technologies. Modernization efforts will continue to include a careful assessment of risks to ensure that an appropriate balance is preserved between current and future requirements.

Considerable progress has been achieved in the transformation process at the same time that the Army remains firmly and successfully engaged in fighting a war on behalf of the nation's security. The Army will remain prepared to respond to the nation's needs today and into the future and will continue its unwavering dedication to providing the most ready and capable sustained land power forces to the Joint Force.

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ANNEX A: DOCTRINE

Doctrine and the Army

Doctrine is the concise expression of how Army forces contribute to unified action in campaigns, major operations, battles and engagements. While it complements joint doctrine, Army doctrine also describes the Army's approach and contributions to full-spectrum operations on land. Army doctrine is authoritative but not prescriptive. Where conflicts between Army and joint doctrine arise, joint doctrine takes precedence.

Doctrine touches all aspects of the Army. It facilitates communication among Soldiers no matter where they serve, contributes to a shared professional culture, and serves as the basis for curricula in the Army education system. Army doctrine provides a common language and a common understanding of how Army forces conduct operations. It is rooted in time-tested principles but is forward-looking and adaptable to changing technologies, threats and missions. Army doctrine is detailed enough to guide operations, yet flexible enough to allow commanders to exercise initiative when dealing with specific tactical and operational situations. To be useful, doctrine must be well known and commonly understood.

As the Army's keystone operations manual, *Field Manual (FM) 3-0, Operations*, provides the principles for conducting operations. It describes the Army's operational-level role of linking tactical operations to strategic aims and how Army forces conduct operations in unified actions. FM 3-0 bridges Army and joint operations doctrine. It also links Army operations doctrine with Army tactical doctrine.

Full-Spectrum Operations

Army doctrine addresses the range of full-spectrum operations across the spectrum of conflict (Figure A-1). Army commanders at all echelons may combine different types of operations simultaneously and sequentially to accomplish missions in war and military operations other than war (MOOTW). For each mission, the Joint Force Commander (JFC) and Army Component Commander determine the emphasis Army forces place on each type of operation. Offensive and defensive operations normally dominate military operations in war and some small-scale contingencies (SSC). Stability operations and support operations predominate in MOOTW that include certain SSCs and peacetime military engagement (PME).

Concepts to Doctrine

The Training and Doctrine Command (TRADOC) Capstone Concept is the warfighting concept that provides a holistic, macro-level description of the future Army and how it will conduct operations. It is the foundation for a comprehensive Future Force body of work, which includes detailed Army operating, functional and enabling subordinate concepts that describe the full range of interdependent operations, functions and related future Army capabilities from a variety of perspectives and levels. The Capstone Concept describes future Army capabilities

and the contributions these capabilities bring to the Joint Force. It describes capabilities for global power projection and employment of U.S. forces across the full spectrum of military operations conducted at strategic, operational and tactical levels in joint, multi-Service and multinational operations, as well as actions involving or in support of other agencies. The development of the concept begins with the study and analyses of a wide range of data to include policy and strategy, Army missions, historical perspectives, operational environments, technological forecasts, assumptions and current Army doctrine.

While Army doctrine emerges from Army concepts and lessons learned, Army concepts themselves are developed in parallel and in collaboration with joint concept developers. *Joint Vision 2020* and a series of evolving joint concepts, including the Joint Operations Concepts (JOpsC), Joint Operating Concepts (JOC), and joint functional and enabling concepts, are key documents in the logic trail from concepts to doctrine. As a new concept begins to mature, it is analyzed in relationship to Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF). These analyses identify future operational capabilities and force design parameters required for maneuver, maneuver support, and maneuver sustainment functions on the battlefield. These documents provide focus for experimentation programs and science and technology. Once an initial draft of a concept is complete, it is analyzed through a process of experimentation and testing. The U.S. Army Transformation Concept Development and Experimentation Campaign Plan (AT-CDEP) guides this analysis, and it may be done in several ways, to include studies by the TRADOC Analysis Center (TRAC), analysis at the battle labs, or in a series of wargames. Results are incorporated into the draft concept to produce a second draft. Once approved, a concept is published as a 525-series pamphlet. Approved concepts become the baseline documents for the development of Army doctrine. *FM 1, The Army,* and *FM 3-0, Operations,* describe how the Army prosecutes operations. Concepts, lessons learned and other factors drive doctrine, which in turn becomes a key ingredient in the combat readiness of the Army. Approved doctrine ensures that the leadership, Soldiers and collective training are all oriented toward

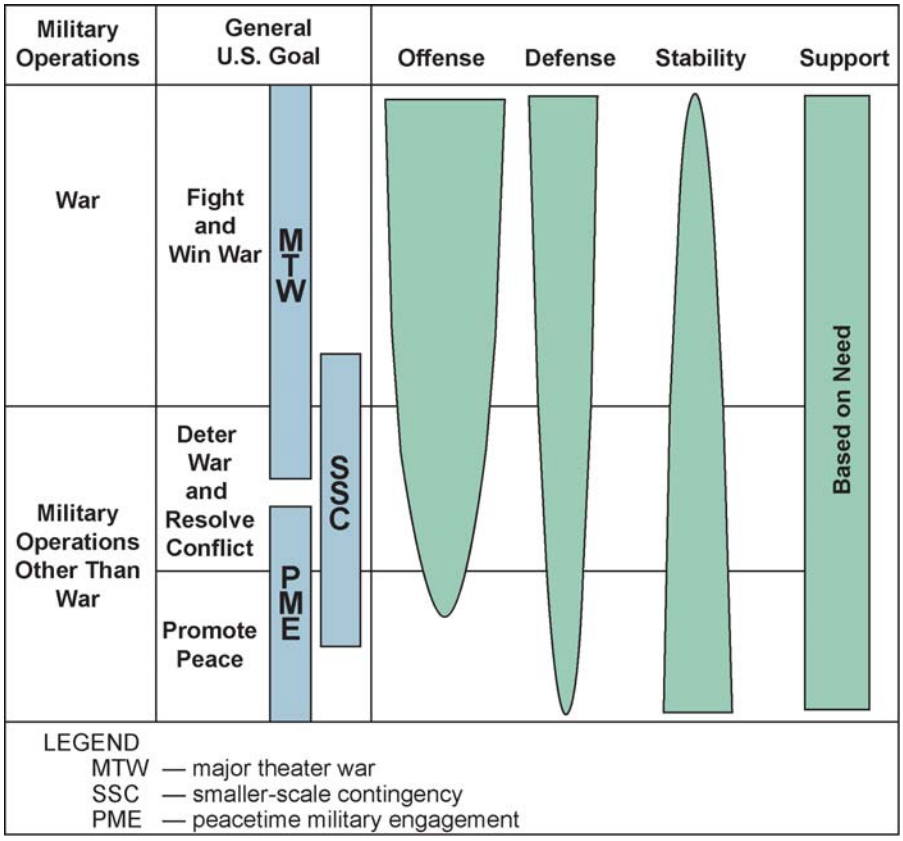

Figure A-1. The Range of Army Operations

fielding an Army with a common operational language, common operational focus and common tactics, techniques, and procedures (TTP).

Sustaining a Doctrine-based Army

The Army's doctrine of the future must enable core warfighting capabilities while increasing its strategic responsiveness and dominance over an expanded range of mission environments and threats. Our doctrine must encourage the relentless pursuit of the initiative in all military operations. It must address the importance that a common picture of the battlefield plays in joint simultaneous engagement in depth, shaping the close fight and winning with overmatch. Doctrine must fully address how to effectively integrate and balance the application of information-enabled precision effects and maneuver into every mission area along the operational spectrum. Firepower not only destroys but also psychologically affects our adversaries and disrupts their formations. It also facilitates the rapid maneuver of the land component forces necessary to take control of a local situation, enabling the exploitation of those effects before the transitory effects of firepower pass.

Doctrine must sustain an Army that will be a hybrid force, with current organizations, training systems, and materiel being replaced by new organizations with different training systems and equipment. It must emphasize the distributed, noncontiguous operations required in *Joint Vision 2020* and experienced in recent operations in Afghanistan and Iraq. It must also address the complete range of potential tactical and operational missions and operating environments, not only open rolling terrain but also close terrain and the equally challenging complex and urban terrain that is becoming the battlefield of choice for potential adversaries. Most importantly, this doctrine must be comprehensive and embrace the full spectrum of military operations, providing a conceptual basis for the rapid transition—without loss of momentum—across the spectrum of operations from offensive and defensive to stability and support operations.

In the near term, TRADOC will update key Army concepts, doctrine, and strategic plans to address full-spectrum operations in the joint, interagency and multinational (JIM) environments. TRADOC will focus on joint doctrine and warfighting concepts that maximize lethality and survivability. Joint capabilities for precision effects and maneuver, particularly the engagement of moving ground targets, will demand concepts and associated capabilities for joint, real-time, fully integrated sensor-to-shooter capabilities. The U.S. Army Special Operations Command (USASOC) has mirrored TRADOC's doctrine transformation process in many respects. The U.S. Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) and the Army Special Operations Battle Lab are preparing Operational and Organizational (O&O) plans that address Special Forces, Rangers, Psychological Operations (PSYOP) and Civil Affairs (CA) doctrine. The USAJFKSWCS is also modifying existing doctrine to reflect new capabilities and lessons learned from recent operations supporting Operation Enduring Freedom, Operation Iraqi Freedom and the global war on terrorism.

TRADOC continues to ensure that Army doctrine is nested within, rather than simply compatible with, joint and multinational doctrine. These efforts to shape Army doctrine will continue throughout the mid- and far terms. By the midterm, TRADOC will reform the doctrinal development process so that it is agile and efficiently reflects the best available thought on the art and science of military operations.

The Army Doctrine Hierarchy

The Army's warfighting doctrine is organized in a two-tiered hierarchy that provides a structure for developing and implementing Army doctrinal publications. Tier 1—Army Doctrine is the highest-level tier and includes our capstone document, FM 1, and our keystone document, FM 3-0. The approximately 40 other Tier 1 FMs offer a broad perspective on Army operations and are instrumental in the proper integration of all other Army doctrine and training publications. Tier 1 doctrine is intended to provide a solid doctrinal basis for all Army operations and, while this level of doctrine changes on a regular basis, it is not intended to change as rapidly as the Tier 2 manuals. Tier 2—Doctrine is the second tier that captures the bulk of proponent, lower-level organizational FMs. There are currently over 600 Tier 2 FMs providing TTP for specific functions, units and the employment of Soldiers and systems**.** Tier 2 publications also include numerous reference FMs covering tasks such as providing first aid, physical training and marksmanship. Army Special Operation Forces (ARSOF) doctrinal publications are being revised to reflect a tiered approach while specific TTP are being included for ARSOF components that will enable timely review and updates of doctrinal publications.

Warfighting Doctrine Development in Support of Transformation

To support the transformation of the Army, TRADOC develops doctrine on the familiar three axes of Army Transformation per *Final Draft TRADOC Regulation 25-36, The TRADOC Doctrinal Literature Program*. Along the first axis, TRADOC is wrapping up the first version of TTP for the Stryker Brigade Combat Team (SBCT). Along the second axis, TRADOC is revising higher-level Army doctrine to better codify Army operations within a JIM construct. On the third axis, TRADOC is revising existing Army doctrine in accordance with the Doctrine Master Plan, a prioritized listing of all Army, joint, multi-Service, and multinational doctrine maintained by TRADOC's Futures Center, Joint and Allied Doctrines Division, and used to obtain and prioritize resources for doctrine development.

TRADOC proponent schools and centers are putting the finishing touches on the SBCT TTP using the Initial Force O&O as a the original framework, now augmented by significant unit input for recent train-up events and certification exercises. The SBCT doctrinal material consists of a small set of core publications to guide the training and early organizational refinements of the SBCT, and follow-on doctrinal publications that support core publications, derived from unit training, lessons learned and unit feedback.

Recently published or soon to be published key Army doctrine include *FM 3-90, Tactics*; *FM 3-93, Decisive Force: The Army in Theater Operations*; *FM 4-0, Combat Service Support*; *FM 5-0, Army Planning and Orders Production*; and *FM 6-0, Command and Control*. As these same publications come due for revision around 2006-2007, the effort for developing SBCT doctrine will merge with the Doctrine Master Plan execution. Publications will reflect transformed doctrine as we move to the Future Force.

The Doctrine Literature Master Plan (DLMP) and Modernization

The DLMP is the mechanism for managing, developing, producing and disseminating doctrine. It accounts for the Army modernization process. It depicts the policy for the development and management of Army, multi-Service and joint doctrine and TTP by

TRADOC and non-TRADOC proponents. Because doctrine development is decentralized across Army agencies, the DLMP establishes standards, ensures consistency, and serves to institutionalize the doctrine development and production process.

Historically, doctrine was viewed as having about a five-year life cycle (without revisions/updates), but certain events may trigger early revisions/updates (changes in the contemporary operating environment (COE), operational lessons learned, organizational redesign, employment of new systems, etc.), especially at the Tier 2 level. TRADOC will continue to realign its current doctrine to determine "what to train" in order to sustain the current force through transformation.

To reduce the impact of resource shortages, TRADOC is researching, studying, and exploring methods through an Integrated Process Team (IPT) to enhance our capabilities to produce relevant doctrine in a timelier manner. TRADOC is leveraging the use of new automation tools, establishing a professional cadre of doctrine developers, and instituting formal training to enhance the doctrine development process.

Doctrine-Training Development IPT

In June 2002, Headquarters, TRADOC established a doctrine-training development IPT. The initiative was cochaired by the Deputy Chief of Staff for Doctrine Concepts and Strategy (DCSDCS) and the Deputy Chief of Staff for Operations and Training (DCSOPS&T) made up of 17 primary members and 25 coordinating members from both the training and doctrine development communities. Key IPT objectives include: establish a technology-enabled, doctrine training development system that provides relevant doctrinal products that are easily tailored to individual and unit needs; create better linkages between doctrine and training development and products; more fully integrate Combat Training Centers (CTCs), Battle Command Training Program (BCTP), Observer Controllers/Trainers (OC/Ts), and instructors into the development process; enhance jointness; and provide feedback on related organizational and resource issues. The IPT's initial work identified the need to separate enduring doctrine from TTP-focused doctrine with separate development processes for each. The IPT is also assessing related technology-based and automated collaborative tools test initiatives. Among these technology-based programs was the Doctrine Taxonomy Initiative (DTI). The DTI project was an umbrella for a number of initiatives that are collectively focused on the development of an object-based, next-generation document publishing system that will support the rapid generation of unique doctrinal products to support all potential users, from doctrine-training developers through individual Soldiers. The TRADOC-lead IPT will culminate in a concept-doctrine-training development system that produces concept-driven, doctrine-based, relevant, integrated, focused, standards-based, timely and user-friendly products to support the field Army transformation efforts.

Object-Based Publishing (OBP) of Doctrine

In FY03, the DCSDCS conducted a proof of principle for object-based publishing of doctrine. This proof of principle, the DTI, showed the ability of doctrine to be stored as stand-alone topics rather than books or manuals. The success of this test was the catalyst for Army-wide adoption of OBP. The principle behind this is a one-time entry of information that eliminates redundancies and creates web-based relational content that links all appropriate information for the Soldier. These information objects will be combined

with methods of retrieval (tools and search agents) to serve the requirements of individuals who need the right information at the right time. The goal is documents that are self-identifying, self-describing and self-assembling. Over 600 doctrinal publications will be converted to this new format in FY04-06, based on the availability of funding. During this time frame, doctrine development and lessons-learned processes will be evaluated and reengineered to capitalize on this new process of storing information. The combination of the new content storage method and improved business processes will result in timely and relevant doctrine in the field.

Future of the Army Doctrine and Doctrinal Process

Doctrine has served the warfighter well over the years but must evolve to support a transforming Army. As the Army transforms toward the Future Force, the methods of producing and disseminating doctrine will change to meet the new requirements of this fighting force. The basic premise of the doctrine development program for the future is not in the development of new architectures or expenditures, but in the transformation of doctrinal information through improved collaboration using structured professional forums, otherwise known as "communities of practices." A structured professional forum is a group of people sharing concerns, passions and solutions about topics, and who deepen their knowledge and expertise through frequent interaction. Professional associations, software developers and skilled craft guilds are examples. Establishing structured professional forums is an effective way to handle complex problems and to share knowledge outside traditional structural boundaries. The Army doctrine development process can harness the use of online structured professional forums through a network-centric knowledge system to streamline the development and fielding of new doctrine. In a time when doctrine needs to be responsive to Soldier inquiries, structured professional forums will play an important role in quickly determining and distributing the requisite knowledge to satisfy doctrinal requirements.

The doctrine community will adopt an information management approach that begins not with a tool but with basic information itself. In this approach, data and information are maintained in simple Extensible Markup Language (XML) document formats, which facilitate easy and simple transfer of objects through Internet protocols without first having to manipulate any proprietary database systems. A doctrinal object is a concise and self-contained document structure that enables the Army to organize and build information into highly specialized and topically focused products. These objects can then be pulled together in any number of combinations to build customized, user-centric documents and other information products. Object-based publications would allow for centralized update and real-time dissemination of information.

A mature object-based doctrine system will reduce direct duplication throughout the Army's documents. In addition, this new system will greatly enhance our ability to conduct rapid, nearly simultaneous, universal updates of related doctrine and training materials. It will provide the ability to capture input from any Soldier, anywhere, at anytime. It will support the creation of an enterprise-wide knowledge system that can facilitate the rapid reception, validation and sharing of key operational lessons throughout the Army.

Our new process must balance our need to maintain enduring, common, contextual doctrine that supports the development of flexible, adaptive leaders, yet allows for rapid

updating of TTP necessary to support full-spectrum units in the train-alert-deploy construct. Using the results of Army experimentation that validate new concepts, new technologies that enhance doctrine development, and disciplines that integrate it with joint doctrine, Army doctrine used by the Future Force will bear little resemblance to the doctrine we have today. This new doctrine must do more than teach Soldiers how to fight, it must be doctrine that teaches the Soldier "how to think about how to fight." Relevant, current doctrine contributes to the establishment and maintenance of the Army Soldier as a profession in that it embodies the codification of an expert compendium of knowledge. This new doctrine and doctrine process will leverage history and experiences with the latest web-based technologies to create, process and distribute doctrine at all levels. The new doctrine storage, processes and retrieval methods will be a key factor in Soldier development and how they access and use knowledge as part of the Future Force.

Conclusion

The Army's doctrine must enable core warfighting capabilities while increasing strategic responsiveness and dominance over an expanded range of mission environments and threats. It must clearly articulate the capabilities of the land component in joint operations. Efforts to shape Army doctrine will continue throughout the mid- and far-terms. By the midterm, TRADOC will reform our doctrinal development process so that it is agile and continues to reflect the best available thought on the art and science of military operations and, in the far term, ensure that the rewrite of fundamental doctrine is accomplished to provide transformed warfighting doctrine for the Future Force.

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ANNEX B: ORGANIZATIONS

Overview

Through a trained and ready force, the Army provides the nation joint and expeditionary forces able to transition to sustained land campaign forces, maintaining our non-negotiable contract with the American people to fight and win the nation's wars. To do this, the Army meets the requirements articulated in the National Security Strategy (NSS), the Joint Strategic Capabilities Plan (JSCP), and the Contingency Planning Guidance (CPG). The Army also is transforming as part of the Joint Force, becoming more strategically responsive and dominant at every point on the spectrum of operations.

The Army is comprised of Active Component (AC) and Reserve Component (RC) Soldiers and civilians. In FY04-05, it is organized into 4 corps, 18 divisions (10 AC and 8 Army National Guard (ARNG)), 15 ARNG enhanced separate brigades, and 2 ARNG strategic brigades (Figure B-1). The Army requires adequate funding through FY11 for an AC end strength of approximately 480,000 Soldiers; an RC end strength of approximately 555,000 Soldiers (350,000 ARNG and 205,000 U.S. Army

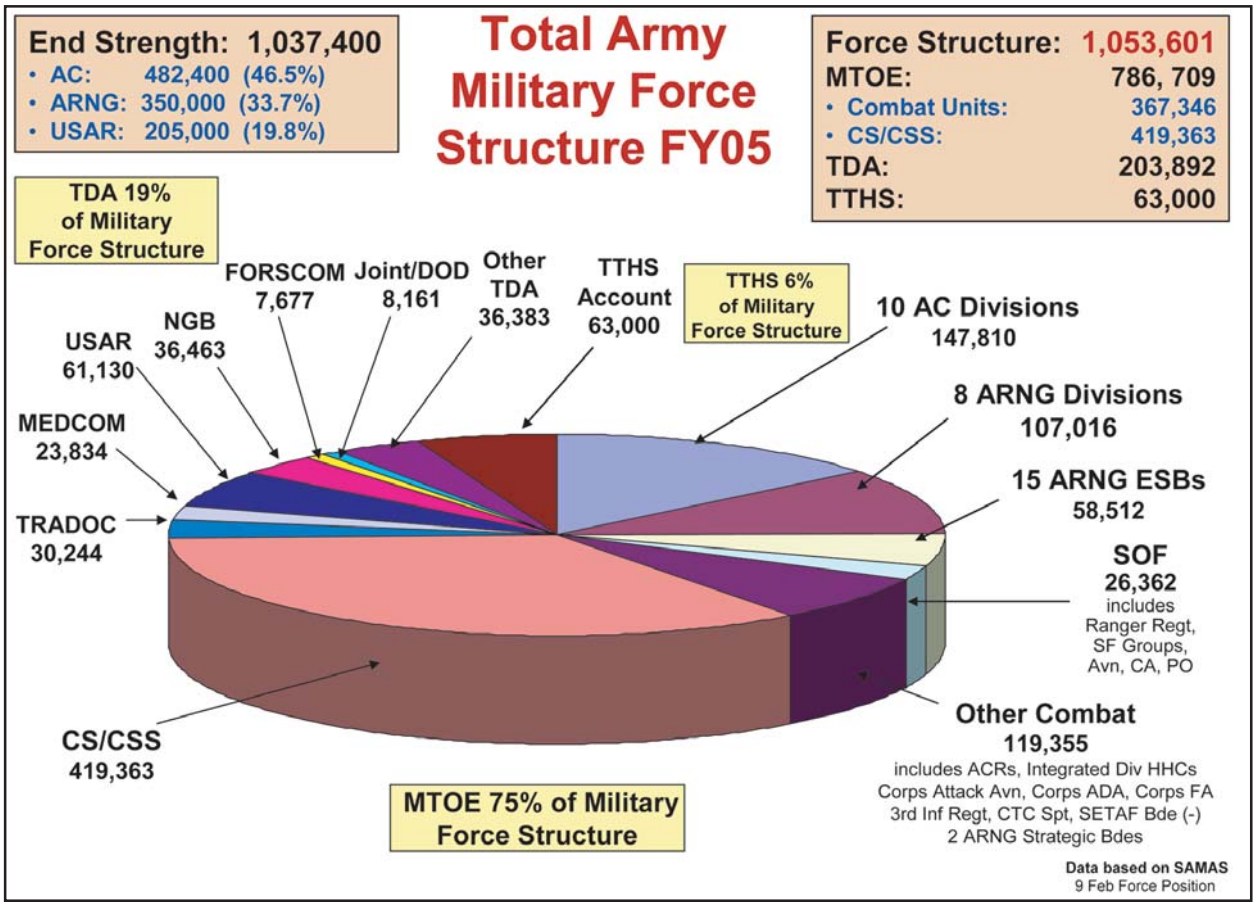

Figure B-1. FY05 Total Army Military Force Structure

Reserve (USAR)); and a civilian workforce of approximately 222,000 personnel.

Army—Current to Future

The Army provides strategically responsive land forces to joint and coalition forces that are dominant across the full spectrum of operations. The Army's Current Force must also transform toward a Future Force that is responsive, deployable, agile, versatile, lethal, survivable and sustainable across the full spectrum of operations. The Army focuses its science and technology (S&T) investment on Future Force materiel enablers such as the Future Combat Systems (FCS). Simultaneously, the Army is fielding a Stryker force of six brigade-size combat teams that will meet the near-term requirements in support of warfighting Combatant Commanders by bridging the capability gap between our light and heavy Current Forces. These Stryker Brigade Combat Teams (SBCTs) will also serve as a bridge to the Future Force. Throughout the transformation process, the Army continues to selectively modernize and recapitalize the Current Force in order to retain significant overmatch over present and potential adversaries.

There are three major aspects of the ongoing Army transformation from a force structure perspective. The first is the redesign of the Army (operational and generational forces) to achieve Future Force capabilities before the end of this decade. In this domain, the Army has already activated three SBCTs and will activate three more (one of which is in the RC) between now and FY08. Additionally, the Army is on a firm path to activate the first FCS-equipped unit in FY10. As a supporting effort to the creation of the FCS-equipped units, the Army is redesigning its force generation forces (i.e., institutional force and infrastructure) to gain advantages in force development, force projection, force management and force sustainment. This redesign is reshaping the business rules of the Army, allowing operational forces to reach back into strategic and national capabilities through enhanced communications and data exchange systems. Efficiencies gained in this area allow the Army to minimize theater-required capabilities while reducing strategic lift requirements normally placed on the Army's sister Services. The Army also adjusts current organizations to become more effective and efficient for the full spectrum of military operations, thus ensuring that we capitalize on all technological, doctrinal and organizational developments to ensure optimal mission accomplishment.

Secondly, the Army reinvests efficiencies gained across the current stock of capabilities and organizations into those organizations that are most critical to Combatant Commanders. The overhaul of our personnel and logistical systems creates efficiencies in force structure that are then reinvested within operational forces to sharpen the package of capabilities required to fight and win the global war on terrorism and posture the Army for future operations.

Lastly, the Army rebalances itself by changing the mix of active and reserve forces to quickly meet operational availability and rotational demands placed on the Army.

These three aspects (force redesign, reinvestment and rebalancing), taken in the aggregate, enable the Army to dynamically recast its forces to meet the needs of the National Security and Defense Strategies, Combatant Commanders and Army commanders in an austere fiscal environment with acceptable risk. Army capabilities supporting the Combatant Commands are enduring. The Army assesses these demands to the Current and Future Forces and

determines how best to resource them. In many cases, due to constraints in Army end strength and Total Obligation Authority (TOA), the Army is strained in such a way that full resourcing of all demands placed on the Army is unattainable within current end strength/TOA. Although these constraints are significant, the Army ensures that we do what is right for our people, maintains readiness and transforms to a future, more strategically relevant Army every day.

Logistics Transformation is a key piece of Army Transformation that directly supports the Army becoming a more strategically relevant force is. The goals of our Logistics Transformation are to ensure Army forces are capable of rapidly deploying in support of current and future operational force deployment objectives; effectively sustaining a full-spectrum Army, while synchronizing Army and joint efforts to:

- Enhance strategic responsiveness—meet deployment timelines
- Optimize sustainment capabilities while minimizing the footprint
- Reduce the cost of generating and sustaining forces while maintaining warfighting capability and readiness

The Army's ability to support the National Security and Defense Strategies remains central to determining force structure requirements as we plan and execute Army Transformation. The Army is leveraging information technology and structuring a totally integrated force, sized and shaped to meet worldwide commitments.

Strategic Planning and Total Army Analysis

The Army uses the Strategic Planning Guidance (SPG) prepared by the Office of the Secretary of Defense (OSD) to build its force structure for the Program Objective Memorandum (POM) through the Total Army Analysis (TAA) process. The 2001 Quadrennial Defense Review (QDR) report first provided a new capabilities-based strategy and a new force-planning construct that serves as the basis for the TAA. The May 2002 Defense Planning Guidance (DPG) and the September 2002 NSS reemphasized the new strategy. The strategy has four elements designed to give the nation a broad set of capabilities to advance and defend our national interests in both peace and war. The elements of the new strategy are: assuring our allies and friends, dissuading adversaries, deterring aggression and coercion, and decisively defeating any adversary if deterrence fails. The force-planning construct set forth in QDR01 replaces the QDR97 "2-MTW" construct with a 1-4-2-1 strategy of protect the homeland ("1"), deter forward in four critical regions ("4"), swiftly defeat adversaries in two near-simultaneous conflicts ("2"), while preserving for the President the option of decisively defeating one of those adversaries ("1"). QDR01 also specifically notes a requirement to maintain sufficient force generation capability, as well as a strategic reserve, and the need for rotational forces to support small-scale contingency operations.

The QDR01, the DPG, the more recent SPG, and the NSS do not change the Army's AC or RC structure or end strength. They clearly articulate homeland security as the highest priority. Additionally, a QDR01 and DPG-directed study will address the roles and missions, forces, and resources for the RC. The new strategy also strongly supports the Army's transformation toward Future Force capabilities. It emphasizes accelerated development of new operational concepts, organizations, and capabilities as part of this transformation. This includes improving the capability of forward-deployed forces to win

rapidly and decisively with minimal reinforcement, enhancing strategic responsiveness, and easing the sustainment burden of reinforcing units. However, it also highlights the requirement to "divest ourselves of legacy forces" while we transform. The transformation process for the Total Army is a long-term process (approximately 25 years), and divestiture must be accomplished while maintaining adequate forces in a go-to-war-today capability.

September 11 and the global war on terrorism confirmed the Army was prepared to answer the call. However, these events also forced the Army to reexamine field commanders' needs, especially in force and homeland protection. Results are being incorporated into Army prioritization. TAA06-11 is ongoing and is incorporating relevant lessons learned from Operation Enduring Freedom (Afghanistan) and Operation Iraqi Freedom on a timeline that will allow for better coordination and review of Army requirements for input to the FY06-11 budget planning period. Additionally, the Army is closely looking at its mix of AC and RC forces to insure it maximizes effective timely support to the Combatant Commanders.

Operating Force Structure

The Army's operating force must be sufficient in both size and capabilities to meet all requirements contained in the new defense strategy to provide the nation with a full range of land force capabilities in support of current and future joint warfighting.

The operating force is the warfighting portion of the Army, the force that fights and wins the nation's wars by providing the combat capability necessary to sustain land dominance. The operating force accounts for approximately 79 percent of the Army.

The Army is fully engaged in daily activities supporting the new Defense Strategy, providing forces for joint operations. Combatant Commanders routinely employ the Army as their force of choice in executing theater cooperative security arrangements. Maintaining our overseas presence and cooperative activities promotes regional stability and gives substance to our security commitments. Additionally, the Army serves as a role model for militaries of emerging democracies and promotes internal stability and democratic growth for such nations.

The Army is continuing to transform from its current force structure to a more capabilities-based future force structure while maintaining its full commitment to Combatant Commanders around the world.

Generating Forces

Under Title 10, the Army's generating force has responsibility for providing the management, development, readiness, deployment and sustainment of the operating force (Figure B-2).

TAA06-11 was the first effort to deliberately capture and approve generating force requirements at Headquarters, Department of the Army (HQDA). The TAA11 Generating Force Requirements Conference quantitatively captured and validated manpower requirements against missions. The Army's generating force consists of approximately 2,400 units and is comprised of military, Department of the Army civilian (DAC) and contract personnel. The generating force, like the operating force, is resourced within programmed end strength. Since both forces must compete against the same resource pool, management of workforce mix (military, civilian and contractor personnel) within the generating force is critical. Historically, the generating force has used approximately 20 percent of the total

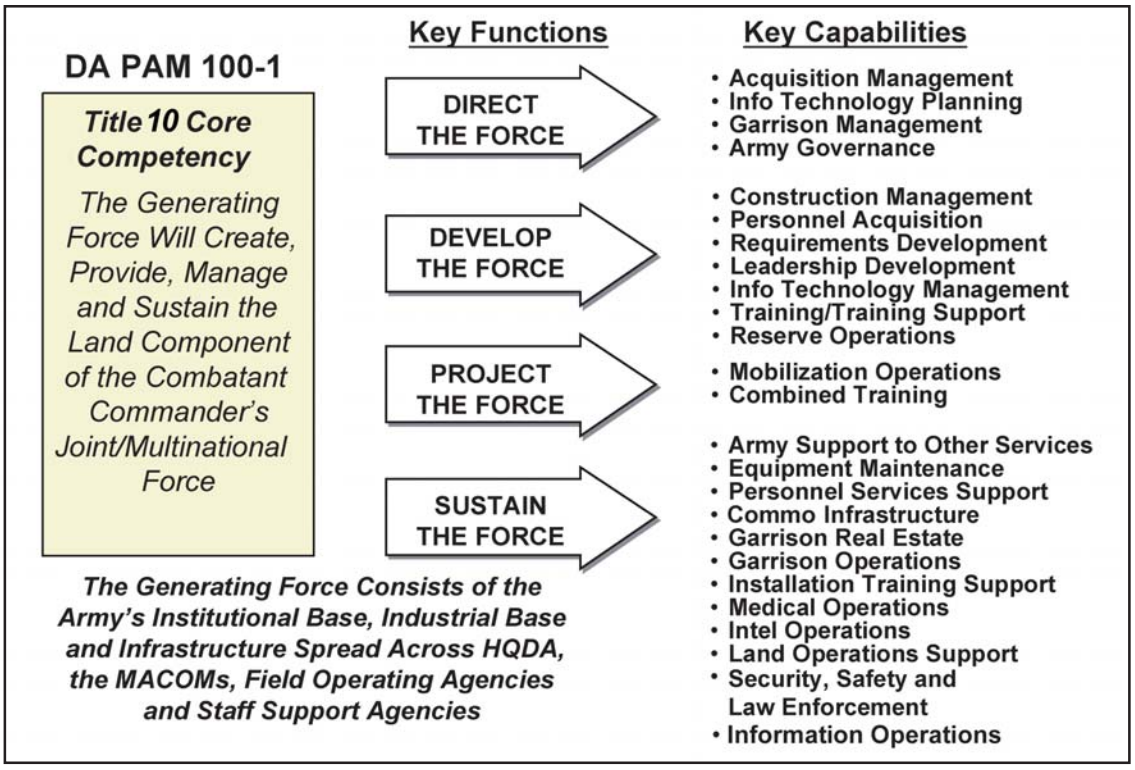

Figure B-2. Army's Generating Force

military end strength across all three components.

Redesign of the institutional force is an integral part of the overall Army Transformation strategy. In December 2001, the Secretary of the Army announced his decisions on realignment of Headquarters, Department of the Army. This realignment began the process of transforming the management and command structure that supports the operational Army. The process of institutional Army reengineering continues with the following goals:

- Divest nonessential functions, remove unnecessary layering and duplication and consolidate functions, resource in the most cost-effective manner, and privatize/ outsource functions where applicable

- Reallocate resources supporting core competencies; fully integrate those resources across the Army, other Services, and DOD

- Reduce acquisition cycles by at least half, anticipating the needs of future organizations; complete major acquisitions within three budget cycles

- Create and sustain a customer-focused learning organization that evaluates itself, eliminates obsolete structures, and designs better processes

- Rapidly create and project an appropriate and capable force to any area of the world.

- Accomplish the reengineered generating force within the Army Vision

Department of the Army Civilian (DAC) Personnel

Department of the Army civilians are major contributors to the Army's overall mission, comprising approximately 18 percent of the workforce and occupying vital support positions in all Army operations. More importantly,

civilians provide stability and institutional knowledge regardless of the organizational level to which they are assigned, from senior management to administrative support. This is particularly true in the area of depot-level maintenance, supply, combat developments, acquisition, training, medical care, research and development, and facilities operations. The civilian workforce is a cornerstone of the Army's CONUS-based, power-projection strategy. With the overall tempo of Army operational deployments and mission requirements increasing, the civilian workforce decline of recent years has been halted. The final structure of the DAC workforce will be affected by the manning recommendations currently under review in support of the transformation strategy initiatives.

Modularity

The Army must retain a wide range of capabilities while significantly improving their flexibility and versatility. A key prerequisite to achieving this capability is developing modular tactical organizations. Modularity is a force design methodology, which establishes a means of providing force elements that are interchangeable, expandable, and tailorable to meet the changing needs of the Army. Although divisions have long been the nominal measure of the Army's fighting strength, recent operations increasingly have witnessed deployment and employment of multifunctional brigade combat teams. The Army is in the process of changing its operational force structure by reorganizing to brigade combat teams as the basic units of maneuver, endowing them routinely with adequate combat, combat support, and sustainment capabilities, and assuring them connectivity to higher and joint assets.

At division level and higher, headquarters will be stripped of organic subordinate formations, becoming streamlined modular organizations capable of commanding and controlling any combination of capabilities, Army or joint. They will be more robust, staffed to minimize the requirement for augmentation from subordinate organizations, and have separable, deployable command posts for rapid response and entry. Every division level headquarters will need to be capable of managing Joint Force Land Component Command (JFLCC) operations. Similarly, every corps level headquarters must be designed from the outset with enough permanent sister service staff positions to permit it to receive and employ a Standing Joint Force Headquarters (SJFHQ) plug, enabling it to serve with equal effectiveness as a Joint Task Force or JFLCC headquarters, command Army tactical units directly, or act as the Army Service Component Command.

The Army will continue to fulfill its strategic commitments while simultaneously transforming to this modular, capabilities-based configuration. The main effort is modular conversion of the current 33 AC maneuver brigades and activation of 10 to 15 additional AC brigades configured as Brigade Combat Teams (BCTs) (UA); conversion to 34 ARNG BCTs; transition of the division base structures to the UEx modular design; and conversion of EAD/EAC CS/CSS structure to modular support UAs. The AC modular UEx conversion sequence is 3rd Infantry Division (M), 101st Airborne Division (Air Assault), 10th Mountain Division, 4th Infantry Division (M), 1st Cavalry Division, 25th Infantry Division, 82nd Airborne Division, 2nd Infantry Division, 1st Infantry Division (M), and 1st Armored Division. Under the Army Campaign Plan, 3rd Infantry Division began to convert to four Armored Brigade UAs and one Aviation UA in February 2004. The RC conversion timeline and unit sequence is not yet determined.

A temporary increase of 30,000 AC manning was approved by OSD to enable the Army to

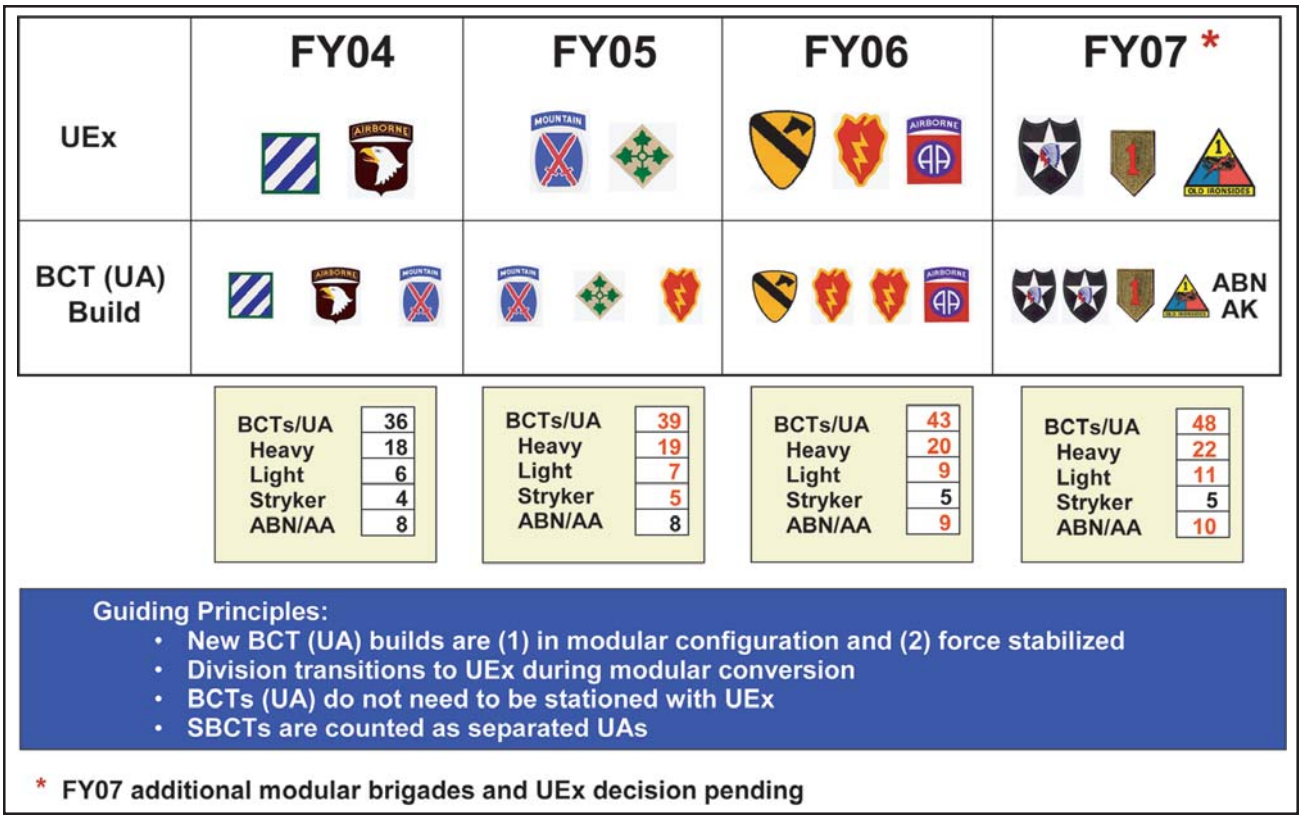

Figure B-3. BCT (UA) and UEx Synchronization

restructure over time while sustaining the level of commitment to on-going combat and supporting operations related to the global war on terrorism. Simultaneously, the Army is initiating force stabilization, regional assignments, and AC/RC balance restructuring actions to complement modular conversions and increase Army readiness and capabilities. Additionally, the Current to Future Force transformation actions that include SBCT fielding and FCS development continue on established timelines.

Air Defense and Divisional Formations

The Army will adjust the divisional Short Range Air Defense (SHORAD) force structure and no longer provide an organic air defense artillery (ADA) battalion to its divisions. Corps ADA battalions will provide divisional air defense force protection. Six of the ten AC divisional ADA battalions and four of the eight ARNG divisional ADA battalions will be inactivated. The remaining four AC divisional ADA battalions along with four ARNG divisional SHORAD ADA battalions will be pooled at corps to provide on-call force protection to AC and ARNG divisions. The pool of Army resources will address operational requirements in a timely manner without stripping an organic capability from deployed "in harm's way" divisional force structure. This pooling concept supports the Army's effort to move to modular designs that allow force tailoring of units better sized and supported to meet Combatant Commander's needs. By pooling and reducing the total number of battalions in the force pool, and through modularity, the Army will be able to modernize the remaining force structure to provide relevant, capable air defense to meet the nation's needs. Additionally, all Stinger teams

will be removed from the six remaining AC former divisional ADA battalions. Avenger crewman that can dismount and function as a Stinger team as required will provide individual Stinger capability. Finally, the Army is conducting an Air and Missile Defense (AMD) end-to-end analysis that will identify required future AMD capabilities by analyzing integrated joint operational capabilities and determining the most effective force mix within existing resource constraints.

Army National Guard Division Redesign Study (ADRS)

The ARNG is continuing execution of the ADRS. This concept converts noncritical ARNG combat forces to combat support (CS)/combat service support (CSS) forces required to support the Army's warfighting requirements. ADRS Phases 1 and 2 are resourced and were programmed in the FY04-09 Plan. The total cost for Phases 1 and 2 is approximately $2.3 billion and approximately 22,000 spaces are converted to CS/CSS units. The Army is closely examining continuation and or change to this process in light of current operational needs and its ability to supply Combatant Commanders with a proper force mix to execute all missions assigned.

Stryker Formations

The Army began the transformation process in early 2000 at Fort Lewis, Washington. The first two units are already organized as SBCTs. The six named Stryker Force units are (listed in conversion order) the 3rd Brigade 2nd Infantry Division, the 1st Brigade 25th Infantry Division, the 172nd Infantry Brigade, the 2nd Armored Cavalry Regiment, the 2nd Brigade 25th Infantry Division and the 56th Brigade 28th Infantry Division (Pennsylvania National Guard). The first Stryker brigade has reached initial operational capability (IOC) and was deployed in fall 2003 as a part of the ongoing mission in Iraq.

This force (Figure B-4) will greatly enhance the Army's ability to be dominant at every point of the operational spectrum. In addition to its strategic deployability, this force will be operationally deployable with its vehicles capable of movement within a theater via C-130-like aircraft. Combining technology overmatch with quality leadership, people, and

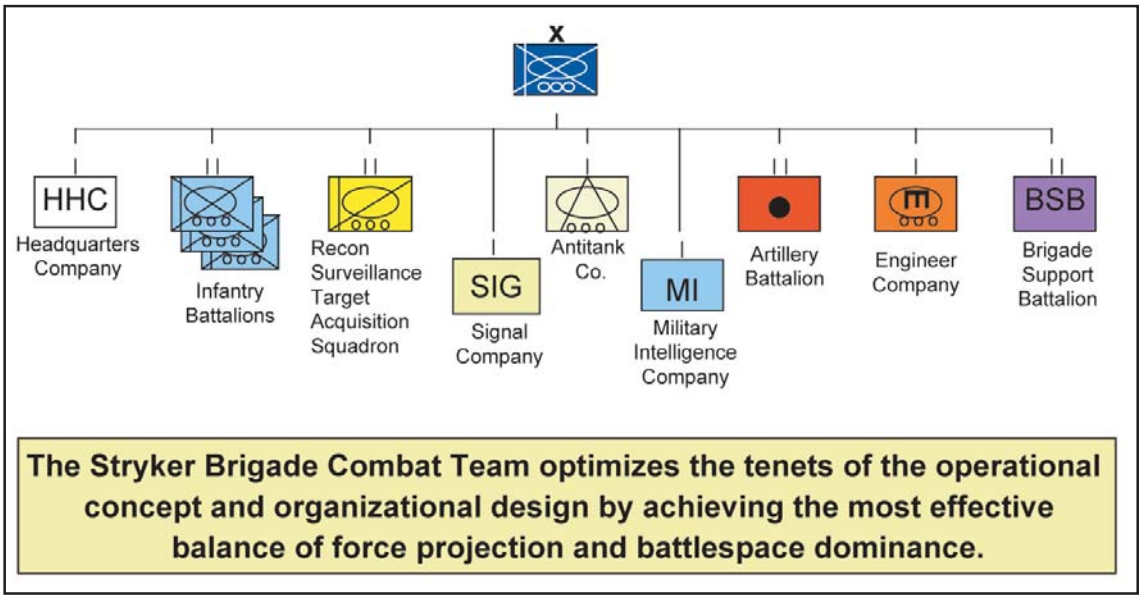

Figure B-4. The SBCT Design

training provides the warfighting Combatant Commanders a land force capable of deterring, containing, stabilizing or decisively terminating a crisis.

Using a single family of vehicles, to equip a brigade-size unit with all of its armored fighting vehicle strength is new to our Army. The Stryker family of vehicles allows the Army to put more force structure at the "tip of the spear" and reduces training and sustainment complexity. Reducing the variety of combat vehicles in a brigade-size force simplifies Army force structure and should reduce the overhead required to properly support the tip of the spear.

Concepts for Army Future Force capabilities already exist. The Army Unit of Action and the Army Unit of Employment are envisioned as the Future Force brigades and divisions/corps of today's force structure. Refinement and implementation of these concepts in deployable go-to-war Army force structure before the end of this decade are key goals of Army Transformation.

AC/RC Rebalancing

The Army is making a concerted effort to rebalance the mix of AC and RC forces with the goal of mitigating stress on high-demand RC units for overseas rotations. This rebalancing effort results in the restructuring of 30,000 spaces of force structure (6,000 AC and 24,000 RC).

The 9 July 2003 Secretary of Defense (SECDEF) memorandum on rebalancing forces directed the Services to eliminate the need for involuntary mobilizations during the first 15-30 days. Additionally, the Services were directed to reduce the current stress on RC units by structuring forces to limit involuntary mobilizations to not more than one year every six years. In response, the Army prepared two program change packages (PCPs) for submission to OSD. The first PCP (PCP 06) dealt exclusively with the issue of responsiveness during the first 15-30 days. The ensuing review resulted in the rebalancing of 5,600 spaces of force structure from the RC to the AC. PCP 07 was submitted to address the SECDEF's directive to limit involuntary mobilizations. Analysis focused on identifying RC organizational shortfalls in support of normal overseas rotational requirements. The resultant recommendation identified approximately 4,000 spaces of RC force structure for rebalancing to create the high-demand unit depth required to limit involuntary mobilizations.

In an effort to improve the responsiveness of the Army, the Chief of Staff, Army, directed a follow-on effort to improve the overall readiness of both AC and RC deployable organizations. Efforts focused on improving overall personnel and organizational readiness through the elimination of an Authorized Level of Organization (ALO) as a resourcing strategy; establishment of trainee, transient, holdee, and student-like accounts for both the ARNG and USAR; and implementation of force stabilization policies. Efforts also focused on improving relevance through the optimization of select RC force structure to perform homeland defense, stability and support missions, and building the required depth to support long-term, steady-state rotational requirements. The rebalancing efforts associated with these initiatives results in the restructuring of over 85,000 spaces of force structure.

The end state of these collective rebalancing efforts is a ready and relevant Army capable of responding to Combatant Commander requirements while simultaneously defending the homeland and possessing the requisite

depth to conduct multiple stability and support operations.

Medical Modernization

The Army continues to work toward completion of the Medical Reengineering Initiative (MRI) as resources become available. MRI reorganizes deployable medical forces at corps and echelon above corps and provides the transitional pathway to the Future Force. To improve the tailorability and modularity of its structure and permit rapid integration to joint and expeditionary applications, the Army Medical Department has introduced a new concept known as Adaptive Medical Increments (AMI). AMI takes an existing medical force structure and offers the Joint and Army Planners a wider selection of prepackaged, cellular subcomponents to choose. This concept allows greater flexibility in developing modular deployment support packages.

As the Army transforms and adapts to a changing world environment, the balance of AC and RC is also changing. Our RC is divesting itself of specific laboratory specialties that historically are difficult to recruit and maintain. At the same time, the Reserves are increasing numbers of forces in areas that are more suitable, such as medical logistics. This shift of technical specialties to the AC will improve the Army's ability to respond quickly to the growing number of contingencies across the globe.

Chemical Corps Redesign

The U.S. Army Chemical Corps is undertaking a dramatic change of its force structure in order to meet the demands of the current operational environment. The new chemical unit designs focus on modularity and flexibility to support both warfighters and domestic response requirements.

The redesign of the Chemical Corps simplifies its overall force structure. The CS, corps, and heavy divisional chemical companies will be multifunctional companies. The CS company will have platoons capable of conducting nuclear biological and chemical (NBC) reconnaissance and decontamination missions. Additionally, these companies will have platoons structured to perform biological detection. All companies will possess the skills and training necessary to support forces in combat as well as to provide support to DOD or civilian authorities in response to domestic chemical, biological, radiological and nuclear (CBRN) incidents. Challenges are anticipated in ensuring these units are equipped with the reconnaissance platforms, decontamination systems, and biological detection equipment necessary to perform their critical missions.

Baseline biological detection and large area smoke generation will continue to be provided by specialized units, and Chemical Corps personnel will continue to man critical staff positions throughout the Army to advise and train personnel in NBC defense.

Military Police

Transformation and the global war on terrorism have served as catalysts for the Military Police Corps to restructure internment and resettlement organizations. The new organizations are modular, deployable and multifunctional AC and RC organizations capable of meeting current and emerging worldwide requirements.

Prior to the events of September 11, and continuing through current operations, the operational tempo of the Military Police Corps continues at an unrelenting pace. Military Police Soldiers continue to support operations from homeland security to operations in Southwest Asia; the demand for Military Police

has never been higher. In response to the continuous high demand for Soldiers and deployable units skilled in law enforcement, corrections and criminal investigations, the Army is planning significant growth in the Military Police structure through the TAA process. Military Police will continue to meet the rotational demands for operations such as guarding high-risk detainees at Guantanamo Bay and in Afghanistan, contributing to peacekeeping missions like Bosnia and Kosovo, investigating criminal operations, and supporting the reestablishment of law and order and stability following major combat operations.

Army Signal Initiatives

Army Signal force structure is in the process of reorganization through multiple force design updates: the Integrated Theater Signal Battalion (ITSB), Tactical Installation and Networking (TIN) Company, Joint Task Force (JTF)/Joint Forces Land Component Commander (JFLCC) Command, Control, Communications, and Computer (C4) packages, and Network Operations (NETOPS) updates. These changes create a deployable, scalable, modular structure with standardized capability, equipment and training Army-wide. The ITSB provides a multifunctional structure that significantly streamlines theater signal structure, reduces the requirement to task organize ("train-as-we-fight" dictum), and bridges the gap between the current and future signal architecture. The TIN Company design adds/enhances network installation capabilities to the Army's cable and wire companies (like cable TV and Internet service providers). The new design is flexible enough to resource the full spectrum of operations from major combat operations to small-scale contingencies to homeland defense operations. The NETOPS force structure update implements the three tenets of NETOPS (network management, information assurance, and information dissemination management) in a tiered Network Operations and Security Center (NOSC) providing real-time, collaborative, integrated, and seamless end-to-end management and defense of theater-level strategic and tactical networks for all Army global applications and information services. This is only the beginning of reshaping Army Signal force structure. Ongoing developments in signal structure below the corps level are still being refined. The Army is leveraging technological developments in order to consolidate networks into fully integrated enterprise architectures for all Army forces.

Multicomponent Units

An MCU combines personnel and/or equipment from more than one component on a single authorization document. The intent is to maximize integration of AC and RC resources in an austere environment. MCUs have unity of command and control similar to that of single component units. MCU status does not change a unit's doctrinal requirement for personnel and equipment, force packaging, or tiered resourcing. MCU selection is based on mission requirements, unique component capabilities and limitations, readiness implications, efficiencies to be gained, and the ability and willingness of each component to contribute the necessary resources. MCUs are now at brigade, division, corps and theater levels, and they range from Army Service Component Command units to brigade and division headquarters companies.

In January 2002, the Reserve Component Coordination Council (RCCC) reviewed the status of the MCU initiative and approved the MACOMs recommendation to continue with the initiative. The Army continues to refine the mix of AC and RC in these units to make them more effective in support of mission requirements.

As of September 2004, there will be 66 units documented as MCUs. The Active Army will be the "flag holder" (sponsoring component) for 38 MCUs, the ARNG will be the flag holder for 2 MCUs and the USAR will be the flag holder for 26 MCUs. The ARNG participates in 19 MCUs, the USAR participates in 58 MCUs, and the Active Army participates in all 66 MCUs. Eleven MCUs contain all three Army component force structure elements. By the end of FY05, the Army plans to grow an additional eight units bringing the total MCU count to 74 units.

Conclusion

The Army continues to provide the nation an array of deployable, agile, versatile, lethal, survivable, and sustainable formations that are affordable and capable of rapidly reversing the conditions of human suffering and resolving conflicts decisively. To do this, the Army's force structure will be optimized in the context of emerging joint operational concepts to be dominant across the full spectrum of operations. The Army's transformation strategy provides the means to achieve future success while mitigating current risks.

ANNEX C: TRAINING AND LEADER DEVELOPMENT

General

The Army's mission remains to provide trained and ready forces to the designated Joint Force Commanders to fight and win our nation's wars. This remains a nonnegotiable mission that the Army must accomplish. Our Army is at war, and we will continue to be so for the foreseeable future. Our Army is a proud member of the Joint Force expertly serving our nation and its citizens as we continuously strive toward new goals and improved performance. The Soldier, his training, readiness, and welfare is central to all that we do.

The American Soldier remains indispensable to the joint team. Flexible, adaptive and competent Soldiers infused with the Warrior Ethos fight wars and win the peace. The individual Soldier is the centerpiece of our combat systems and formations. Training Soldiers and developing leaders to function as effective units is central to mission success. Soldiers must be highly trained on mission essential tasks. Leaders must be able to rapidly apply the military decision-making process. They must be able to clearly define their information requirements, quickly synthesize information, intuitively assess situations, rapidly conceptualize courses of action, and clearly communicate their intent and decisions. Units and leaders must be highly trained and disciplined in the use of information resources to assure timely delivery of critical information.

The Department of Defense's (DOD's) *Transformation Planning Guidance* (TPG), states, " We must transform not only the capabilities at our disposal, but the very way we think, the way we train, the way we exercise and the way we fight." We are reexamining and challenging our institutional assumptions, paradigms and procedures to better serve our nation. The end result of this examination will be a more relevant and ready force—a campaign quality Army with a joint and expeditionary mindset. The Army will retain the best of its current capabilities and attributes while developing others that increase relevance and readiness to respond in the current and projected strategic and operational environments.

To increase the relevance and readiness of our operating and institutional forces, the Army has two core competencies supported by a set of essential and enduring capabilities. The Army's core competencies are (1) to train and equip Soldiers and grow leaders; and (2) to provide relevant and ready land power capability to the Combatant Commander as part of the joint team. To further concentrate the effort, the Army's senior leadership has established immediate focus areas with specific guidance for planning, preparation and execution of actions aimed at rapidly effecting necessary and positive change.

Previously, the Army had conducted an extensive assessment of its training and leader development under the Army Training and Leader Development Panel (ATLDP) process. Close integration and synchronization of the immediate areas of focus with the previous efforts under the ATLDP will be needed to combine these efforts under the DOD Training Transformation Implementation Plan.

Army Culture

Army units operate in battle as part of the Combatant Commander's joint team. Because we fight joint, we must think, train, educate, and exercise joint. Army culture must embrace its nesting within joint culture. Jointness must be incorporated in every facet of Army culture. Jointness must be a common thread running through all aspects of Army training and leader development.

Army culture is representative of American society as evidenced by the adoption of the seven Army values: loyalty, duty, respect, selfless service, honor, integrity, and personal courage. These values play a critical role in shaping the beliefs of Soldiers and leaders. Army culture is internalized over time by its members, as reflected in their practices and beliefs. Influences external to the Army will continue to shape that culture.

Leader Development

Leader Development is the deliberate, continuous, sequential, and progressive process, based on Army values, which develops Soldiers and civilians into competent and confident leaders capable of decisive action. Closing the gap between training, leader development, and battlefield performance has always been the critical challenge for any army. In an era of complex national security requirements, the Army's strategic responsibilities now embrace a wider range of missions that present even greater challenges to our leaders. These operations will include combined arms, joint, interagency, and multinational (JIM) considerations.

The Army Training and Leader Development Model centers on developing trained and ready units led by competent and confident leaders. The model identifies an important interaction that trains Soldiers now and develops leaders for the future. Leader Development is a lifelong learning process. The three core domains that shape the critical learning experiences throughout Soldiers' and leaders' careers are the operational, institutional, and self-development domains. All of these activities take place within an Army culture bound by distinct values, standards, ethics, and a warrior ethos.

Focused on the Soldier, these domains interact using feedback and assessment from various sources and methods, to include counseling

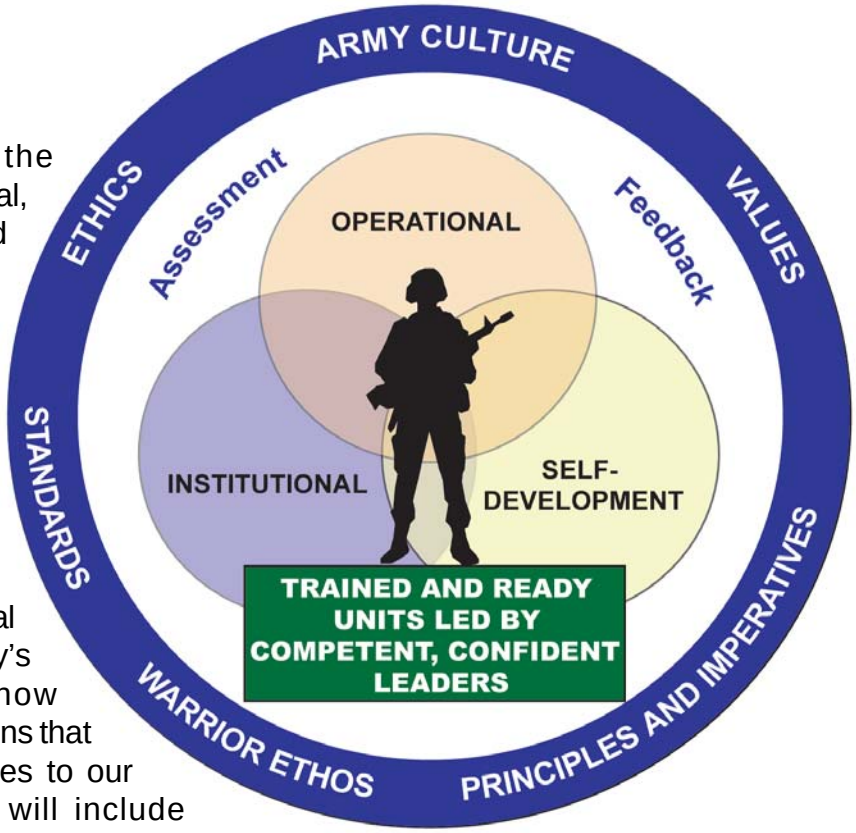

Figure C-1. Leader Development

and mentoring, to maximize warfighting readiness. Each domain has specific, measurable actions that must occur to develop our leaders. The operational domain includes home station/deployed training, combat training center rotations, joint training exercises (e.g., Joint National Training Capability (JNTC) exercise, Joint Air-Ground Center of Excellence (JAGCE) rotations, etc.), and operational deployments that satisfy national objectives. Each of these actions provides foundational experiences for Soldier, leader, and unit development. The institutional domain focuses on educating and training Soldiers and leaders on the key knowledge, skills, and attributes required to operate in any environment. It includes individual, unit and joint schools and advanced education. The self-development domain, both structured and informal, focuses on taking those actions necessary to reduce or eliminate the gap between operational and institutional experiences. Throughout this lifelong learning and experience process, there are formal and informal assessments and feedback of performance to prepare leaders for their next level of responsibility. Assessment is the method used to determine the proficiency and potential of leaders against a known standard. Feedback must be clear, formative guidance directly related to the outcome of training events measured against standards.

To assist in achieving success in the self-development domain, we will leverage technology through the Battle Command Knowledge Network (BCKN). Using BCKN, leaders will collaborate on solving common organizational problems, share branch-specific lessons learned, and form virtual teams to effect changes in doctrine.

One mandate of Army Transformation is to ensure the link between training and leader development is well understood in order to prepare Army leaders for full-spectrum operations. Linking these two fundamental obligations commits the Army to training Soldiers and civilians while developing them into leaders. Training and leader development is a team effort and the Army has a role that contributes to force readiness. For example, the institutional Army, which includes schools, training centers, combat training centers, and noncommissioned officer (NCO) academies, train Soldiers and leaders to take their place in Army units by teaching doctrine and tactics, techniques, and procedures (TTP). Units, leaders, and individuals train to standard on their assigned missions, first as an organic unit, then teaming to become an integrated component of a task force. Operational deployments and major training opportunities such as Combat Training Centers (CTCs), CTC-like training, and Mission Rehearsal Exercises (MREs)/Mission Readiness Exercises (MRXs) provide rigorous, realistic, and stressful training and operational experience under actual or simulated conditions to enhance unit readiness and produce bold, innovative leaders. Simultaneously, individual Soldiers, NCOs, warrant officers, officers, and the civilian work force are responsible for training themselves through personal self-development.

Commanders have the ultimate responsibility to train Soldiers and civilians, and develop leaders who can adjust to change with confidence and exploit new situations, technology, and developments to their advantage. The result of this Army-wide team effort is a training and leader development system that is unrivaled in the world. Effective training and leader development produces trained and ready units, led by competent, confident leaders that can accomplish assigned missions across the full spectrum of operations in a JIM environment.

Leader Education System

Officer Education System (OES)

The OES is being adapted to meet the needs of the transforming Army and the realities of the contemporary operating environment (COE). We have begun to adapt instructions to include the new operational environment and will gradually expand this to incorporate all programs of instruction (POI) and training scenarios. The Army requires leaders who are able to manage training in order to prepare their unit for operations. Leaders must understand the development of mission essential task list (METL) as well as the entire Army Training Management Cycle and the other tenets set forth in *FM 7-0, Training the Force,* and *FM 7-1, Battle Focused Training*.

Basic Officer Leader Course (BOLC)

The BOLC incorporates recommendations from the ATLDP-O and the OES Needs Analysis Study. It transforms precommissioning and officer basic courses to better prepare second lieutenants to achieve success in the COE immediately upon arrival in their first unit. The objective is to develop technically competent and confident platoon leaders grounded in leadership and field craft, regardless of branch, who embody the Army values and warrior ethos and who are physically and mentally strong. To achieve this objective, BOLC capitalizes on experience-based training, logically structured to build upon and reemphasize previous lessons learned.

Phase I (Precommissioning): The traditional commissioning sources are revising their curricula to train and educate the majority of performance tasks (basic Soldier and leader skills) commonly performed by all lieutenants. Each officer candidate or cadet, regardless of commissioning source, will be trained using the same standards and POI. They will be steeped in the values and traditions of the Army, and will possess a clearer knowledge of what it means to be an officer.

Phase II (Experiential Leader Training): Upon graduation/commissioning, lieutenants attend the second, branch-immaterial phase of BOLC. This course is physically and mentally challenging, with 84 percent of the training conducted hands-on in a tactical or field environment. The platoon is the focal point for all activities, as each student is evaluated in a series of leadership positions under varying conditions/situations. A highly trained cadre of officers and NCOs continuously assess and counsel the performance of each student. Officer students also participate in several peer reviews and self-assessments. The curriculum includes advanced land navigation training, rifle marksmanship, weapons familiarization, practical exercises in leadership, chemical, biological, radiological and nuclear (CBRN) operations, and use of night vision equipment, and culminates in squad and platoon situational-training exercises using contemporary operating environment scenarios (including urban terrain). Students also complete several confidence courses containing obstacles that challenge students to overcome personal fears. Lieutenants depart BOLC II with greater confidence, an increased appreciation for the branches of the combined arms, and a clearer picture of their personal strengths and weakness. To date, four highly successful pilot courses have been conducted.

Phase III (Branch Specific Training): After gaining confidence in their ability to lead small units, these officers are prepared to learn the specialized skills, doctrine, tactics, and techniques associated with their specific branch. Upon graduation, officers will proceed to their first unit or attend additional

assignment-specific (Airborne, Ranger, language school, etc.) training.

Curriculum refinement for the BOLC pilot program will continue in FY04 reflecting the needs of the Army and recommendations from graduates. When implemented, BOLC will provide the institutional training and education required to develop the high-quality officers needed to lead the Future Force.

Captains' Professional Military Education (PME) is being redesigned based on the feedback from numerous survey results. Currently, Captains' career development is not meeting the needs of the professional company grade officer. Analysis of the data indicates that emphasis is needed on assignment-tailored training focusing on specific primary staff positions, realistic scenario-driven command training, and minimal time away from the family. Future Captains' PME will be a change from the current six-month model and will feature:

- Company command and staff competencies
- Branch and combined arms focus
- Linked to next duty assignment
- Introduction to joint operations
- Digital skills
- Knowledge- and application-based instruction
- Leverage learning technologies
- Less than six months in length

The reevaluation of Captains' OES requires branches to update task analysis of all company commander and staff officer positions. This is leading to the validation and quality assurance of all present officer advance courses and the updating of their Terminal Learning Objectives (TLOs). The end state is a Captains' OES that prepares captains for their next job, making them more productive and adding to a positive working environment. The method of instruction is being redesigned to give a realistic, hands-on experience to stimulate better recall during all situations, most importantly in a combat environment.

Intermediate Level Education (ILE) consists of two phases: the core curriculum course and the qualification course. The core course is a 13-week military education level (MEL) 4 awarding course (similar to term I of Command and General Staff College (CGSC)) taught by the CGSC to officers in the four career fields. A 28-week qualification course (similar to terms II and III of CGSC) is being developed by CGSC for officers in the operations career field. Each Functional Area (FA) in the other three career fields will conduct individual qualification courses ranging from two to 178 weeks in length. The core course provides Army officers a common MEL 4 education and Joint Professional Military Education (JPME) I credit; qualification courses prepare officers for duties in their respective career field or FA. International Military Students (IMS) will continue to join their U.S. counterparts in most OES and ILE courses (core and FA)

Warrant Officers Training and Education

Our warrant officers are highly specialized, small unit leaders and trainers who serve their entire career honing technical and tactical skills. As our senior leadership changes and technology advances, warrant officers provide the essential continuity for these transitions. The COE and full-spectrum operations require a fully integrated officer corps ready to meet the challenges of the Current and Future Forces. To fully exploit the unique capabilities of this cohort, the Army must complete the full integration of warrant officers into the officer corps.

Central to the concept of full integration is the creation of a single OES for all Army officers. This OES will include the technically specific elements of warrant officer training and education, rather than maintaining a separate, stand-alone Warrant Officer Education System (WOES). This integrated education system must develop and implement nested training opportunities, investments in infrastructure and educational technologies, and staff and faculty. We will begin this process by developing a combined pre-appointment and pre-commissioning training course for all officer and warrant officer candidates, producing officers bonded and grounded in common fundamentals, capable of small unit leadership, and possessing sound conceptual and interpersonal skills. Newly appointed warrant officers will continue to receive warrant officer specific training to attain and sustain the technical competencies and balanced leadership skills required by each branch. Assignment-oriented training and education opportunities will be expanded to prepare our warrant officers for the unique assignments which may lay outside their normal specialty or that are above their grade.

A comprehensive systematic needs analysis, job analysis, and critical individual task analysis of warrant officer training and education will be completed in accordance with the Systems Approach to Training process to determine the training and education requirements by branch, specialty, and grade.

NCO Education System (NCOES)

Soldier and leader competency is the center of gravity for our Army. A critical near-term task is to transform our NCOES to insure it develops the competent and adaptive leaders required in a more complex and uncertain environment. While the current NCOES is not broken, the world and the Army are changing. Therefore, NCOES will also change. NCOs will continue to be the masters of leader tasks for their respective levels of responsibility and of individual and small unit training; they will continue to be the recognized experts in field craft, basic marksmanship, Soldier care, and technical skills. In addition to these traditional skills, the Army will develop NCOs who can master new information quickly, adapt to rapid mission changes, and take advantage of opportunities on the battlefield. Our educational system will train the right tasks at the right levels and will prepare the NCOs to operate in both the analog and digital environments. In developing a future NCOES, we will look at three critical areas:

Infrastructure. Future strategies for infrastructure will address the combining of both Active Component (AC) and Reserve Component (RC) training and officer/NCO training events. The use of RC Training infrastructure will leverage AC/RC training by providing more locations by reducing distance and travel cost for soldiers. Our capabilities will also fully leverage the live, virtual, constructive (LVC) learning environment to provide the right training, at the right place and right time in a Soldier's learning path. Our infrastructure will move us from place- and time-based learning strategies to a strategy that pushes training to the Soldier anyplace and anytime it is needed.

Faculty. Changes in learning strategies and the incorporation of new technologies require our NCOES faculties learn new skills. Each member of an NCO academy and proponent school cadre will master the use of technology and understand how to develop both live and virtual collaboration skills in their students.

Curriculum. The Future Force Soldier will operate in a dynamic and network-centric environment requiring enhanced thinking,

learning, and decision-making skills that allow them to act decisively based on the commander's intent and good situational awareness. The instructional design of NCOES will become more experiential and problem solving-oriented. Our overall design for professional development will include the integration of shared training opportunities between officer and NCO development systems. As the Army evolves to meet full spectrum operational requirements, expectations of the NCO corps will increase and the tasks normally associated with more senior NCOs will migrate downward. We will also begin to develop NCOs who are competent battle staff NCOs at the SSG level and continue to grow and refine those skills at the SFC and MSG level.

Primary Leader Development Course (PLDC)—Educating the Sergeant. The Sergeant is the primary first-line leader for our Soldiers. PLDC is the developmental experience that transitions the Soldier to becoming an NCO. Feedback from the Army indicates the current PLDC is not sufficiently performance-oriented. A new PLDC POI addresses that concern. As we evolve the PLDC, we will field a course of instruction that:

- Is more experiential-/performance-oriented
- Has a clearer focus on the NCO's responsibility to lead and train
- Emphasizes the "Be and Do" aspects of NCO leadership
- Emphasizes troop-leading procedures and field craft
- Provides the NCO with the capability to actively participate in the after action review (AAR) process
- Is more challenging with numerous problem-solving situations
- Teaches self-development and stresses developmental counseling, goal setting, and linkage to training in course POIs

Basic NCO Course (BNCOC)—Educating the Staff Sergeant. At the SSG level, we will continue to develop leaders who are masters of their Military Occupational Specialty (MOS) as well as expert trainers and training managers. At this level, we will continue to focus on leading and training inside the platoon formation and on providing the initial exposure to core staff skills needed inside the battalion formation. We will provide SSGs training on:

- Common and MOS-specific skills
- How to lead and train the squad and section
- Performance-based learning using the concept of leader labs
- A clearer focus on leading and training within platoons and squads
- Enhanced MOS technical and tactical skills
- Multi-echelon, shared training events with other ranks
- Exposure to staff skills needed in the battalion and brigade tactical operations centers (TOCs)

Advanced NCO Course (ANCOC)—Educating the Sergeant First Class. At the SFC level, the focus needs to expand from MOS-specific training to the battlefield operating system. The focus becomes leading and training inside the company formation and expanding the NCO's staff skills to those needed inside the brigade formation. The

officer-NCO relationship receives more attention at this level. At this level, we will train the SFC on:

- Common and MOS-specific skills
- How to lead and train the platoon
- Expanded battle staff skills at the battalion and brigade level
- Leading and training inside the company and platoon formation and the relationship to the company team and battalion task force
- A broader understanding and capability beyond the specific MOS
- More multi-echelon, common/shared training events with other ranks
- Skills, knowledge, and attributes (SKA) that foster conceptual thinking and reasoning
- Focus on officer-NCO relationship inside the company/battery/troop

Educating the Master Sergeant and First Sergeant. Today, the NCO does not receive any formal training between the ranks of SFC and MSG. In the past, two functional courses, First Sergeant Course and Battle Staff NCO Course, have attempted to fill this void. Since neither is tied to promotion and not all NCOs attend, many newly promoted MSGs must learn to succeed at their new rank the hard way. The Army is currently analyzing the potential need to develop and implement a new standard Skill Level 5 course for SFC(P). This potential course would provide all newly promoted MSGs and 1SGs a core education consisting of leading, training, and some tactical skills. Based on their MOS or assignment, these NCOs would also take one or more of three additional tracks of Technical, First Sergeant, or Staff Skills.

Sergeant Major Course (SMC)—Educating the SGM/CSM. The capstone of NCOES continues to be the Sergeant Major Course. However, some of the same deficiencies mentioned about PLDC are also true of the current SMC. Teaching by VGT will be replaced by problem solving activities, where students learn by doing. Training for the SGM/CSM will include:

- Battle staffs inside the Brigade Combat Team
- How the Army runs
- Sister Services' roles and missions
- Operations within a joint context
- How to lead and train at the battalion level and above
- Team building/building high-performance teams
- Command team relationships
- Training and education on both analog and digital operations
- Leading complex organizations/group dynamics
- More performance-based simulation, simulation-driven exercises to explore full spectrum operations

Department of the Army Civilians (DACs)

The ATLDP civilian study revealed that DACs are committed to the Army, want to be held accountable for their performance, seek

training and development opportunities and desire good leadership. A robust civilian leader development program, directly linked to readiness, is under development to support the increased requirement for civilians in leadership roles as military positions in the institutional Army are civilianized. The panel study reflects that our DACs want a leader development system similar to the system that exists for Soldiers—a system consisting of mandatory, structured, progressive, and sequential training and education courses with a timeline for attendance. Major initiatives currently being worked are:

- Moving proponency for Civilian Leader Development from the G-1 to the G-3
- Integration of civilian and military training where possible and the creation of a Civilian Education System which will have commonality with OES, NCOES, and WOES
- Develop leader training and education that supports a civilian leader's career path requirements and professional development

These changes will insure that the Army will have the trained competent and confident civilian leaders it needs to support the Army mission, readiness, and other requirements of the 21st century Army.

Self-Development

The Army must have Soldiers and leaders who continually seek to improve their knowledge, skills and abilities. Self-development initiatives contribute to a leader's development by focusing on maximizing strengths, minimizing weaknesses, and ensuring that professional and personal goals, needs, and objectives are realized. Self-development is a continuous, career-long process. It takes place during institutional training and development and during operational assignments and should stretch and broaden the leader beyond the job or training requirements. Self-study, professional reading programs, and civilian education courses support the individual's developmental goals. Self-development supports the requirement for all leaders to be self-aware—to know their strengths and weaknesses in order to take the necessary steps to improve their skills, leadership, and attributes.

The focus of self-development is twofold: to fill individual Soldier or leader training, experience, and education voids; and to ensure the Soldier meets personal and professional goals. The individual self-development portion of the leader development program is a joint venture between the individual and his or her chain of command.

Self-development is empowered by individuals' acceptance and commitment to Lifelong Learning wherever they are located. Lifelong Learning fills knowledge gaps and provides greater depth and breath of knowledge that educational and operational experiences do not provide. The single most critical element of Lifelong Learning is feedback. Feedback sets the basis for increasing self-awareness and identifying individual Soldier and leader developmental needs. This strategy must integrate training and education content and materials with operational experiences, assessments, and feedback to ensure effective learning of required skills, knowledge, and attributes.

Army Distributed Learning

Distributed Learning (DL) is the delivery of training to Soldiers and units through multiple means and technology. DL allows students,

leaders, and units centralized access to essential information and training. It represents a powerful capability in which the proper balance of course content and delivery technologies are provided when and where they will have the greatest impact on force readiness.

The Army Distributed Learning Program (TADLP) is a Department of the Army (DA) program that was approved for implementation in 1996. TADLP is funded in FY98-10 to field DL classrooms and convert selected Army courses to DL delivery media. The mission of TADLP is to improve training, enhance force readiness and support Army Transformation by exploiting current and emerging technologies to facilitate the development of self-aware and adaptive leaders through Lifelong Learning and the delivery of the right training and education to the right Soldier and leader at the right time and place. The TADLP Campaign Plan contains the requirements, policies, and management tasks to ensure the program's support of Army readiness.

Infrastructure

TADLP is an approved Army acquisition program that is integrated with the Army National Guard (ARNG) Distributed Training Technology Project (DTTP). The DTTP is a congressionally directed assistance program with an acquisition component. TADLP and DTTP complement each other but have different missions and objectives. TADLP focuses on military readiness training for AC and RC forces. The DTTP supports and extends TADLP's military readiness training goal while also supporting multiple ARNG missions to include command and control of state Guard units, and providing shared community access to electronic technology.

Courseware

Selected courses are being redesigned to provide DL training phases/modules. These courses will allow students to participate in both synchronous and asynchronous multimedia training. Selection of courses for DL redesign is based on Army readiness requirements and high-level interest of the senior Army leadership. Under the current plan, over 525 courses will be redesigned for DL delivery by FY10.

The Army provides a comprehensive library of computer-based training courses in many functional areas. An interface developed among Army Knowledge Online (AKO), Army Training Requirements and Resource System, and the computer-based training program provides one portal entry (via AKO) for these programs. The one-portal entry makes computer-based training visible in formal Army school catalogs and greatly expands the marketing of the online courseware. All Army users have access to mentoring services, technology, and learning resources by linking to the global web.

The Classroom XXI Program (CRXXI)

Although separate from TADLP, CRXXI provides training modernization that enhances the TADLP Digital Training Facility (DTF) at Army resident schools. This program improves training provided through the schools and allows the broadcast of training to remote TADLP/DTTP DTFs. In addition, CRXXI establishes Army standards for courseware development and playback, instructional technology capabilities that are Soldier-centered, and design and architectural standards for classrooms. CRXXI is scheduled for completion by the end of FY09, with a total of 270 classrooms to be fielded.

Army Training

The Army requires Soldiers and leaders, steeped in the warfighting capabilities and doctrine, to be knowledgeable and experienced in how to analyze the ability of their units to operate and sustain themselves on the battlefield. Warfighting modules will teach leaders standard U.S. Army techniques and procedures for tactical decision-making and the tactical employment of companies, battalions and brigades in combined arms full-spectrum operations. Warfighting training will be tactically focused, hands-on, execution-oriented, and will culminate with an exercise that stress and develop the leaders' ability to rapidly make decisions and to apply the elements of combat power within the operational framework of full-spectrum operations. The intent of the warfighting curriculum is to produce leaders who are highly skilled in combined arms maneuver, support, and sustainment of companies, battalions and brigades as part of the joint team.

Figure C-2. Soldier and Leader Development

Home Station Training

Units will be trained to execute dominant maneuver. Unit standard operating procedures (SOP) must reflect TTP standards, and processes that apply across the force. Standardized practices will better contribute to force tailoring and enable commanders to be more effective at campaign planning. Future Force units must be prepared to deploy with units stationed anywhere in the world. Early deploying units will plan training based on a train–alert–deploy–execute model. Home station battle command training gives battle staffs the opportunity to practice and gain competency and proficiency while reinforcing knowledge learned in the institutional training base.

The critical nature of the sustainment mission sets it apart from the other functional areas and requires emphasis during training and leader development. In carrying out maneuver sustainment, an important area of responsibility rests in training for focused, anticipatory logistics. In the areas of leader development and education, unit and collective training, and individual Soldier self development, increased emphasis will be placed on preparing training support packages (TSPs) and simulation scenarios for distribution through embedded battle command training systems at home station and when deployed. This will ensure logistical requirements on the battlespace for the maneuver forces are correctly anticipated and positioned.

Enhancing battle staff abilities is achieved through training in an environment that uses assigned C4 and ISR systems and approximates the intensity and decision making of the operational environment. The synthetic training environment (STE) will bring the constructive and virtual capability needed to augment the live training environment improving the realism of home station training. Advanced simulators and simulations are needed to fully stress battle staff proficiency.

As the Army begins to integrate the current and developing C4 and ISR systems into the training environment, it must ensure the certification and accreditation standards are met for information assurance purposes. The additional costs associated with providing security for systems normally operating in a Secret System High (SSH) environment must be identified and provided to maintain the integrity of the operational capabilities.

Joint Training

Contemporary operating environments increasingly require seamless integration of JIM operating elements. Army leader development and training programs, which are being executed more in a joint context, are incorporating broader knowledge and perspectives. The end state will be Army leaders who demonstrate the values, character, competency and confidence to lead Soldiers, sailors, marines, airmen, and coastguard—in any mission. In addition, Army leaders will be able to successfully participate in coalition operations throughout the world.

Using commonly shared TTPs, units will be able to adapt to an operational environment that includes government, nongovernmental organizations (NGO), private volunteer organizations, and Special Operations Forces (SOF). When required by assigned missions, the training of Soldiers, leaders, and battle staff will incorporate consideration of JIM and SOF planning, command and control and execution. Home station and deployed training capabilities will provide Soldiers, leaders, and battle staffs with the means to conduct full spectrum of operations (to include the integration of SOF) in a JIM environment.

Training While Deployed

Our Soldiers, leaders, and units must have the capability to train while deployed to sustain operational readiness and/or train new tasks as required by the mission. Our training support systems must be built to support the home station training strategy, training at the combat training centers, and for mission planning and rehearsal while deployed. The embedded training system design for the future force systems will go a long way in meeting these requirements. In the meantime, the Army must provide training support and kits in support of current operations in Iraq, Afghanistan, and Bosnia. This could include range targetry, MILES, Mobile MOUT, Engagement Skills Trainers, virtual simulations and other training aids, devices, simulations and simulators (TADSS).

Combat Training Centers (CTCs)

The CTC Program comprises the Battle Command Training Program (BCTP); Combat Maneuver Training Center (CMTC); Joint Readiness Training Center (JRTC), National Training Center (NTC), Joint Air-Ground Center of Excellence (JAGCE), and parts of the JNTC. The CTC rotations remain the Army's capstone training events for battalions and brigades, divisions, and corps. Their focus remains leader development and readiness. The primary purpose of the CTCs is to develop self-aware, adaptive leaders and ready units for full-spectrum JIM operations. CTCs will

accomplish this by integrating a contemporary and joint operational environment into all training. This environment will include: simultaneous, noncontiguous, and continuous operations in a distributed, global, LVC training capability under a JIM context. Army units will get a rigorous fight in the COE including offensive, defensive, and stability and support operations against a freethinking and adaptable OPFOR. The battlefield will be arrayed in depth to maximize stress on digital C4ISR systems. Complex terrain including MOUT operations will be a part of each rotation. SOF operations will be integrated throughout the rotation as well as realistic combat service support (CSS) play to stress the logistics structure. Instrumented feedback for both formal and informal AARs will facilitate sharing of lessons learned to home station, institutions, and deployed units. Deployment training will remain a paramount aspect of CTC training to include realistic TPFDD flow. The Army fully supports the JNTC where joint integration will become the norm. Finally, expanding global reach of the CTCs will be necessary to rapidly respond to future training challenges to support units preparing for or in combat. As a result, the Army will explore exportable CTC capability with deployable instrumentation and AAR enablers to support a joint expeditionary mindset.

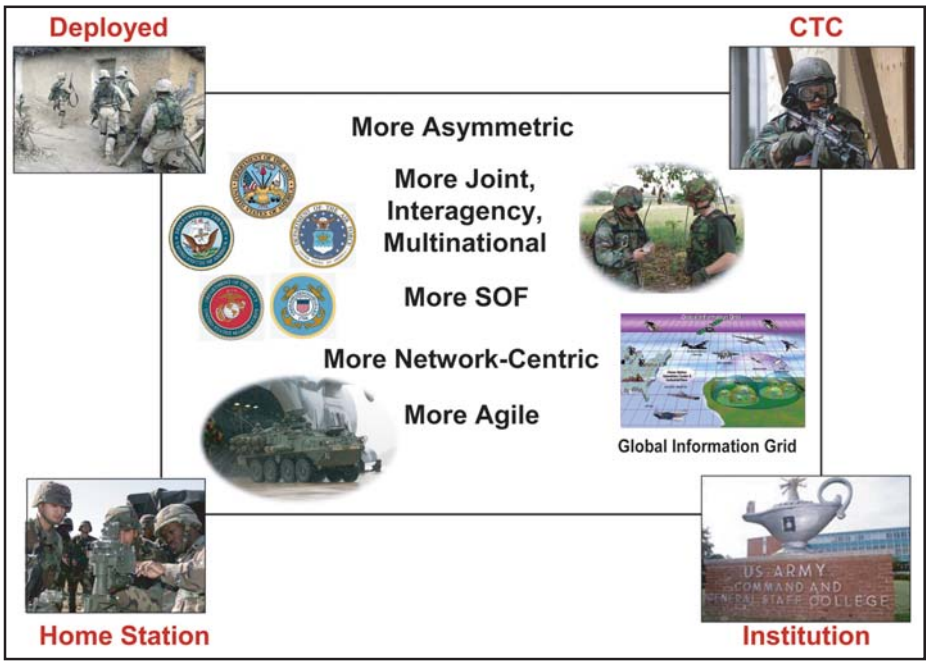

Figure C-3. How We Will Train in the Future

The U.S. Joint Forces Command (USJFCOM) is designated as the implementing Combatant Commander for the Joint National Training Capability under the Training Transformation Implementation Plan. The JNTC links designated Services' training centers, training facilities and training enabler support capabilities into a net-centric readiness training capability across the LVC Training Environment (LVCTE). Four specific thrust events for the Horizontal, Vertical, Integration and Functional will establish the initial operational capability of the JNTC under USJFCOM. The Unified Command Plan (UCP) has been revised to reflect this new role for USJFCOM. The Army G-3 issued guidance and tasking to achieve this JNTC and its key enabler of LVCTE.

Future Force

The Future Force will be highly trained to be strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable across the entire spectrum of military operations. Soldiers and leaders will be confident and competent, capable of rapid synthesis and assessment of information and immediate situational understanding.

Commanders will be able to clearly define their information requirements, shape the situation, effectively communicate their intent and mission-based orders, and execute with precision. Future Force Soldiers and leaders will form the core of lethal and effective units capable of exploiting information dominance and employing warfighting systems of systems to meet the Future Force operational requirements. They will be adaptive and self-aware—able to master transitions in the diversity of 21st century military operations.

The Future Force requires units trained to rapidly transition from one mission to the next and conduct mission planning en route while assembling a task organization tailored into force packages for mission execution. Commanders and battle staffs must be trained to see and understand the battlespace. Organizations need to be skilled at the rapid collection and fusion of information from manned/unmanned systems coupled with human intelligence (HUMINT) that enable situational understanding and decisive operations. Commanders and battle staffs must synchronize and integrate joint fires to allow Future Force units to mass effects at the critical space and time. Training must enhance air and ground maneuver in complex terrain and enable sustained combat operations without a loss of momentum.

The training environment must be developed to approximate the operational environment. Our modernization effort must allow for the implementation of the Future Force soldier model and transform initial military training. It must also implement the Future Force leader development framework and transform professional military education. We will embed training in our operational platforms and resource the institution to meet "reach" requirements mandated by the force. Our LVC training capabilities must be integrated and linked to joint training capabilities. At end state, our Army will enjoy training capabilities with seamless links between institutions, home station, combat training centers, and when deployed. By achieving these capabilities, the Army will be able to train, alert, deploy, and execute to meet our nation's complex national security requirements.

While there will be changes in the framework of the strategic environment, the contemporary and future operational environment, doctrine, and force structure, the most significant difference will be how we apply advanced and dynamic technology to create a full-spectrum capable Army and a fully integrated, relevant training support system that seamlessly merges training across the institution, unit, home station, CTCs, and deployed theaters. This use of technology will help streamline the operational planning and training management process and enhance training capabilities, ultimately ensuring competent, trained, and ready Soldiers and units for more rapid deployments across a full spectrum of operations. The difference between operations today and Future Force operations is a requirement for greatly enhanced Doctrine, Training, and Leader Development (DTLD) capabilities, enabled by improved processes and an integrated training support system (TSS) that supports Soldiers and leaders whenever and wherever required.

Future Force Concepts and Capabilities

Training and developing the Future Force Soldier and leader require available doctrine and a fully linked and integrated training and leader development capability. This capability is derived from an assessment of Future Force warfighting concepts and capabilities. The strategic concepts derived from this analysis are:

- Sustain a doctrine and standards-based Army
- Be capable of full-spectrum training
- Develop Future Force Soldiers
- Develop Future Force leaders

From these concepts follow seven strategic capabilities, which include:

- Develop technologically enabled, highly responsive, flexible, tailored, dynamic knowledge depositories containing doctrine, TTPs, and training support publications, products, packages and modules
- Embed training tools in operational and institutional systems of systems
- Integrate Army LVC training capabilities and link to joint training capabilities
- Make training and training support available on demand
- Link training environments and domains through the infosphere and the Global Information Grid
- Implement the Future Force Soldier model and transform initial military training
- Implement the Future Force leader development model and transform PME

Centers and schools of the institutional Army will continue to provide baseline proficiency of Soldiers and leaders assigned to operating units. During initial military training, centers and schools will continue to train new recruits and officers, instilling the Army values and warrior ethos, and preparing them for their operational assignments. During PME, centers and schools will continue to develop leaders through NCO, Warrant Officer, and officer education programs. Additionally, in times of crisis and need for Army expansion, centers and schools will remain vital to the mobilization requirements of the Army.

The goal of unit training is mission readiness. Field commanders will continue to employ the principles of Army training to ensure proficiency on mission essential tasks. Training will be standards-based and prepare units to operate in a JIM environment. The intent will be to provide leaders and Soldiers with a realistic, operationally relevant training capability that can replicate the full spectrum of operations. Meeting these requirements will require an integrated enhanced Training and Leader Development Model, enabled by an integrated Training Support System (TSS) that will link the Soldier and leader to the centers and schools and the CTCs through a global information infostructure (GII).

Training Modernization

The Training Support System (TSS)

The Army TSS is a system of systems that provides the networked, integrated, interoperable training support necessary to enable an operationally relevant training environment for warfighters. In short, it is an integrated training support enterprise. It is comprised of product lines, architectures and standards, and management, evaluation, and resource processes that enhance training effectiveness.

Product lines are the integrated, interoperable capabilities that enable the conduct of training and education. They consist of training information infrastructures; TADSS; training

products; training facilities and land; and training services. The product lines provide the capabilities that trainers and soldiers need to train in the institution, operational, and self-development domains.

Architectures and standards provide the means to ensure integration and interoperability across product lines. Architectures are the structure of components, their relationship, and the principles and guidelines governing their design and evolution over time. There are three types of architectures—organization, functional, and systems—each of which may have operational, technical, and systems views. The TSS focuses on the training domains, which have a direct correlation with the views. Standards are the technical rules and specifications necessary to build and ensure interoperability in an integrated training environment and are related to the views. They are addressed as part of the technical view.

Management, evaluation, and resource (MER) processes employ best business practices to plan, implement, and sustain the TSS. They are the overarching business practices that enable informed training support decisions in support of training requirements. These processes consider both internal and external drivers that impact TSS and guide the development, maintenance, and sustainment of the TSS.

The TSS will:

- Enable self-development, institutional, and operational training at any location including, home station, deployed operational theater, and CTCs

- Enhance training by providing standards and technologies that increase effectiveness, accessibility, interoperability, and supportability

- Support the development of training and doctrine products while minimizing duplication by horizontally and vertically integrating the course content and delivery methods

- Provide the means for training as we fight, injecting battlefield realism through exercise control, training and scenario management; automated data collection and reduction; and application strategies and remediation tools—that include automated training instrumentation systems, models and simulations, and tactical engagements systems

- Provide the means to rehearse mission execution during real-world operations

Live, Virtual, Constructive (LVC) Training

Live training, carried out effectively to a high doctrinal standard, is the cornerstone of operational success. It is essential to maximize the capability, availability, and accessibility of ranges and training land to support doctrinal training, mission rehearsals and deployment training. The Army's Range and Training Land Strategy establishes priorities for investments in the transformation of ranges and training land to support the COE and Future Force. This strategy reflects Army training priorities and serves as a roadmap common to MACOMs carry out the Army's training missions, and the Installation Management Agency (IMA), that manages range and training land infrastructure in support of those training missions. Key range transformation initiatives include: the Digital Multi-Purpose Range Complex (DMPRC), Battle Area Complex (BAX), and NGATS are the first tie into training the Future Combat Systems (FCS) weapon systems and

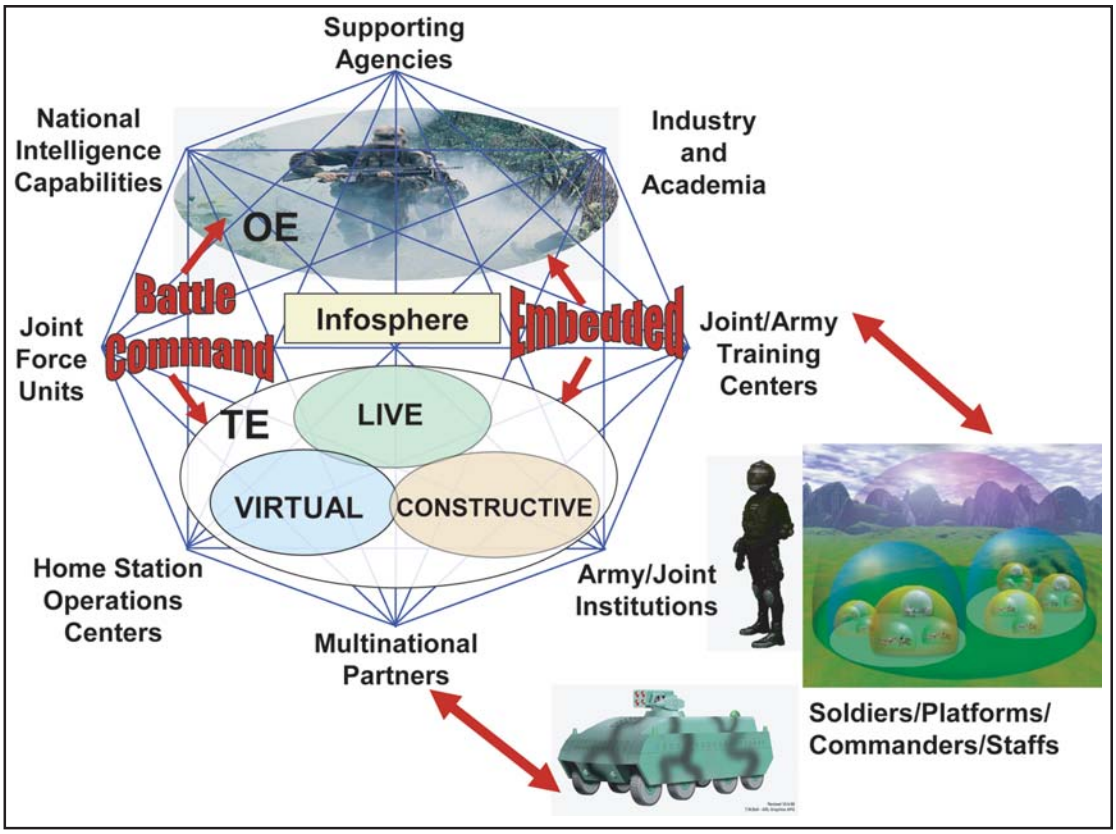

Figure C-4. Future Training Environment

maintaining the edge for current weapon systems such as the M1A1AD. The instrumentation of the ranges, such as the DMPRC and BAX, is the critical step of testing the networked systems of the FCS Unit of Action. These specific Current Force ranges will evolve to the Future Force Range concept being developed by TRADOC. The successful implementation of the business end of FCS is when the sharing of information in the FCS sensor array allows for the precision targeting and grouping of precision fires for target kills.

Virtual simulation training is executed on computer generated battlefields and provides crews, leaders and units with realistic, immersive training experiences using embedded training capability or man-in-the-loop simulators that approximate the physical layout of tactical weapon systems and platforms. In the virtual environment, simulators operating on virtual terrain take the place of weapon systems and can be linked to expand the scope of the training event. Virtual training systems provide commanders with "walk-level" training, sustainment training, gated training events, leader development, and mission rehearsal capabilities. Through frequent and repetitive use and an immediate and total replay AAR capability, virtual training systems assist commanders with the building and sustaining of training readiness. Virtual training also has the advantage of allowing Soldiers to perform tasks too dangerous for the live environment (such as calling for artillery fires on or near an occupied friendly position), provides the capability for rapid changes to scenarios, and facilitates retraining specific tasks until training objectives are met. Virtual simulations allow repetitive training under varying conditions to enable the individual or team to conduct live training at a higher state of readiness, potentially reducing OPTEMPO costs. Many virtual simulations also provide a

link to the Army Battle Command System (ABCS), thereby providing a realistic training environment for the digitized units and battle staffs.

Constructive simulation training is the use of computer models and simulations to exercise the command and staff functions of units from platoon through Joint Task Force. Constructive simulations permit multiple echelons of command and staff to execute their normal warfighting tasks in an extensive exercise without the resource constraints of large bodies of troops, and provides a versatile, cost-effective, low-overhead training environment that trains leaders how to visualize the battlespace and to make tactical decisions in a time-constrained, digitized environment. It also provides the "wraparound" for LVC integrated events and extending the battlespace to provide more realistic scenarios. Through the repetitive execution of tactical scenarios followed by AARs, commanders and staff officers gain a realistic understanding of how to take advantage of the enhanced situational awareness afforded by the ABCS.

The LVC training capability must be fully integrated and networked, at the appropriate echelon and at the appropriate frequency to support full spectrum training. A deliberate linkage of LVC with the C4ISR system-of-systems architecture must be developed to support training of the Soldier on demand, anywhere or anytime. The goal is a near-seamless integration of the training environments to more realistically replicate the operational environment.

Embedded Training

The embedded training vision will give units an expanded range of training options that will enhance readiness by building constructive and virtual training capabilities into systems. Unit commanders will be able to conduct mission planning and rehearsal, gunnery practice, and force-on-force maneuver exercises with live and virtual players at home station or deployed. While embedded training will not replace the need for live training, it will significantly expand the opportunities for realistic practice on limited terrain and with limited availability of the full component of Army and JIM participants while decreasing reliance on stand-alone TADSS and the infrastructure required to support them.

Embedded training at the platform level will provide a full task training capability for operators/crews to include an embedded high fidelity tactical engagement simulation capability for force-on-force and simulated gunnery training. It will have simulation/stimulation drivers and a software capability to create computer generated forces providing units the ability to conduct collective training of tactical formations and battle staffs from organic platforms. A reach capability to support mission planning, current operations, and training will be embedded and linked to the institution through the Army Knowledge Enterprise. The embedded system will also include a standard AAR capability and a training management system for individual, crew, and unit.

Deployed Training Support

The Army will provide for appropriate live, virtual and constructive training support capabilities for deployed units. The degree and depth of such training support will be based on standards reflected in Army training strategies. Examples include, deployable range packages in the form of Contingency Augmentation Range Packages (CARP) for specific units, and Training Augmentation Range Packages (TARP) for MACOMs and theaters to adapt to

changing live fire training standards driven by the COE.

Training Aids, Devices, Simulations, and Simulators (TADSS)

System and nonsystem TADSS support the major objective of an overarching Army training strategy, that being the establishment of policy supported by adequate resources to accomplish defined training and mission rehearsal capabilities for the Current and Future Forces. Training transforms people, equipment, and doctrine into capabilities. From a modernization viewpoint, this objective is supported by the effective and efficient integration of systems and nonsystems training technologies and development within the live, virtual, and constructive simulation environments across the home station, deployed, CTC, and institution domains. TADSS provide the commander with deployable and portable combined-arms collective training and mission rehearsal capabilities, to include joint operations, and enable units to train and rehearse missions in a resource constrained environment at home station and deployed locations. The vision is to build a synthetic training environment that links LVC simulation training capability with "fair fight" capability. "Digitizing the battlefield" to provide seamless, digital command and control (C2) capabilities for the entire fighting force is one of the Army's top priorities. To meet this requirement, multiple initiatives are underway to harness the power of the microprocessor and information technology for warfighters. The goal is to use digital technology to maintain a continuous edge in projecting and employing combat power on future battlefields. Mirroring this effort are initiatives to embed the complex, combined arms structured training of the future into the systems of the digitized force.

Nonsystem TADSS that Support the Operational Domain

Live Training

Army Targetry Systems (ATS)/New Generation Army Targetry Systems (NGATS). ATS provides nondigital, live-fire ranges that incorporate infantry and armor targets, both stationary and moving, that portray realistic opposing target threat scenarios to the Soldier under simulated battlefield conditions. NGATS is the future Army ground targetry system that will provide high-fidelity target signatures, evasive targets, shoot-back capability, and remote scoring. Using commercial off-the-shelf (COTS) technology, NGATS will provide a more reliable system at lower cost. The NGATS will be mobile, transportable, deployable, and capable of continuous support during designated training periods.

Air Defense Artillery (ADA) Targets provide targets and ancillary devices for gun live-fire crew weapon qualification and training events currently resourced under the Standards in Training Commission (STRAC). They provide required training and opportunity training to the Air Defense Soldiers for gun and Stinger missile live fire.

Instrumented/Digital Ranges. Instrumented/ Digital Multi-Purpose Training Range and Range Complex provide new and modern ranges capable of training and stressing today's Soldiers and their modern equipment with a realistic train-as-you-fight environment, using all available combat systems capabilities, and digitally integrating those systems to manage all forces undergoing individual and collective live fire training and qualification. Battle Area Complex (BAX) is a training range designed to support the newly established Stryker Brigade Combat Teams (SBCTs). The

BAX will provide the SBCT commander a venue to train the majority of his force in one or a combination of linked training facilities. While the layout is typically to support combined arms training scenarios, the individual and crew requirements were incorporated to allow specific weapons platform qualification.

Integrated Military Operations on Urbanized Terrain Training System (IMTS) provides a melding of three separate but similar thrust efforts into a combined umbrella program. These programs are the transition Military Operations in Urban Terrain (MOUT) sites, the Combined Arms MOUT Task Force training sites, and other MOUT facilities programs. The program will reduce acquisition and sustainment costs, leverage technologies and acquisitions, solve complex and common problems, foster Horizontal Technology Integration (HTI) through commonalties and standards, synchronize and integrate the collective efforts of the Common Training Instrumentation Architecture (CTIA) by leveraging near-term requirements, and support the objectives of the Urban Operations Training Strategy.

Precision Marksmanship provides for enhanced individual weapons proficiency training in the institutional base and in units. Specific individual weapons type ranges are provided with precision scoring capability to support basic and specialized skills.

Aerial Weapons Scoring System provides a live fire qualification capability for Attack Helicopter units.

Contingency Augmentation Range Packages (CARP) for specific units, to construct live fire training infrastructure in theater, and **Training Augmentation Range Packages (TARP)** for MACOMs, the IMA and theaters to adapt to changing live fire training standards driven by the COE.

Range MILCON Projects provide for construction of major ranges and acquisition of training land at Home Stations in the AC and RC to support Transformation. Range and land projects are contained in the Army Master Range Plan (AMRP). These MILCON projects, for the most part, drive Non-System Training Devices (NSTDs) investments.

Multiple Integrated Laser Engagement Systems (MILES) replacement provides tactical engagement simulation for direct-fire, force-on-force training using eye-safe laser "bullets." MILES training has been proven to dramatically increase the combat readiness and fighting effectiveness of military forces. Enhancements include discrete player identification for all participants, enhanced audio-visual cueing effects, event recording and display, increased programmability of weapon characteristics, and increased ability to account for side, flank, corner, and rear shots.

Fixed Tactical Internet (FTI) is a permanently installed network of Enhanced Position Location Reporting System (EPLRS) radio sets with an EPLRS Network Manager that enables digital communications across the Army's Tactical Internet. The FTI acts as an alternative means to provide on-demand digital communications in support of testing, training, maintenance, and experimentation at Brigade and below. The FTI can significantly reduce deployment of Signal Company assets during training events. It is being fielded to installations fielded with the Stryker, M1A2, and M2A3 vehicles as well as Fort Benning, Fort Knox, and Fort Gordon. FTI does not provide a capability to train with Blue Force Tracker or other non-EPLRS-based communications systems.

One Tactical Engagement Simulation System (OneTESS) OneTESS is a family of tactical engagement simulation systems that supports force-on-force and force-on-target training exercises at brigade and below, in all battlefield operating systems at home station, maneuver CTCs, and deployed sites. The system will require execution of proper engagement procedures. It will simulate weapon systems' accuracy and effects and stimulate detectors, sensors, monitors, and countermeasures. OneTESS will use a common architecture compliant with the Common Training Instrumentation Architecture (CTIA). Embedded training in the Future Force end state will incorporate OneTESS.

Home Station and Instrumentation Training System (HITS) is being reevaluated for an accelerated fielding. It provides objective data collection of unit performance in force-on-force, force-on-target, live fire, and associated command post exercises. HITS supports combined arms training and exercise events. HITS will be the data transfer bridge between live training and the other training environments through CTIA and the LVC IA.

Virtual Training

Engagement Skills Trainer (EST) 2000 provides a capability to conduct virtual marksmanship training at all skill levels for individuals, fire teams, and squads. It offers an opportunity to conduct and evaluate tactical training in a virtual environment. EST 2000 replicates small arms and crew-served weapons, as well as multiple shooting courses, can support training of up to 15 Soldiers at the same time, and provides an immediate AAR capability. EST 2000 also provides a judgmental use of force training capability through instructor-manipulated shoot–don't shoot scenarios.

Close Combat Tactical Trainer (CCTT) uses various simulators, emulators, and semi-automated forces replicating combat vehicles, weapon systems, dismounted forces, combat support (CS), CSS, C2, and opposing forces. It is networked to provide fully interactive unit task training (collective training) on computer-generated terrain. It is being fielded in mobile configurations (platoon level) for the ARNG and United States Army, European Command (USAREUR) and at fixed sites (company/team level) to support armor and mechanized infantry training for the rest of the AC. CCTT supports virtual, collective, combined arms training of armor, mechanized infantry, and cavalry units from platoon through battalion/squadron level.

Aviation Reconfigurable Manned Simulator (AVCATT-A) is a mobile, transportable, trailerized virtual simulator with the capability to conduct realistic, high-intensity, task-loaded, collective and combined-arms training exercises and mission rehearsals in a simulated battlefield environment. AVCATT-A system capabilities directly support the "train as you fight" concept and allow commanders to focus on and tailor training to specific battle focused training requirements, the unit's mission essential task list, and combined arms wartime mission requirements. Units will train as units, not as individuals or aircrews. Commanders and staff personnel will plan and command and control, and aircrews will plan and execute. Training is observed, recorded, evaluated, and repeated as necessary to train collective tasks to standard and to reach the desired level of proficiency at the desired level of complexity. The AVCATT-A system is a critical element of the Aviation Combined Arms Training Strategy and Flying Hour Program. It supports institutional, home station, deployed and CTC training for AC and RC aviation units worldwide. The AVCATT-A system will interoperate with other virtual and constructive simulation systems through local area networks

and wide area networks utilizing broadcast and multicast modes. It will be Distributed Interactive Simulation/High Level Architecture (HLA), Joint Technical Architecture–Army, and Synthetic Environment Core compliant, and achieve air-ground, combined arms interoperability with the CCTT. The AVCATT-A system provides six reconfigurable manned modules, semiautomatic forces, after action review, battlemaster controller, and role player capabilities for fire support, ground maneuver, battle command, close air support, engineer, and logistics functional areas. Each manned module is reconfigurable to current Army attack, reconnaissance, utility and cargo aircraft.

Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT) provides high fidelity, tactical proficiency sustainment training and completes interaction between battle command staff and intelligence system counterparts. It also supports vertical and horizontal digital battle staff training, and live and constructive simulations (ACTF and OneSAF).

Call For Fire Trainer (CFFT) provides quality training for MOS 13F skill levels 1-4, as well as a common task trainer for all Soldiers. The system will be HLA interoperable and will operate in a stand-alone mode to train from one to thirty students in an institutional training environment. CFFT will operate at the unit level to train forward observers without the use of live ammunition. It will be interoperable with other CATTs locally and via long-haul networks. It will monitor performance and provide feedback in accordance with the Army AAR process. CFFT replaces GUARDFIST II and training set, fire observation (TSFO).

Constructive Training

Corps Battle Simulation (CBS) provides a discrete event simulation that is designed specifically to train Army corps and division commanders and staffs. This simulation also supports joint training serving as the ground model when linked in the Joint Training Confederation with models from other Services. CBS models ground movement, ground combat, artillery, air defense, engineering, NBC, supply, medical support, maintenance, transportation, radar, and fixed and rotary-wing air operations, special operating forces, and airlift/airdrop. CBS is used during Battle Command Training Program (BCTP) warfighter exercisers and allows the commander to fight his organization and assess its training proficiency. Recent developmental efforts are focused on COE enhancements such as improved terrain, multi-sided combat, universal systems, civilians on the battlefield, enhanced Army Tactical C_2 Systems (ATCCS) linkage, small unit operations, and improved aviation and Air Defense Artillery (ADA). The simulation can be linked to ATCCS using Run Time Manager (RTM) simulation-to-ATCCS interface boxes.

Joint Deployment Logistics Model (JDLM) is an exercise driver used to stimulate exercise play for the collective training of AC and RC commanders and their staff in command, control and coordination of CSS. The training audience includes the CSS commanders and staffs in echelons above corps, corps support commands, and division support commands, as well as their subordinate headquarters down to battalion level. The simulation is both stochastic and deterministic and will accommodate any theater, depending on the database. JDLM is the only existing Army-approved training simulation capable of providing the detailed logistics information needed to train CSS staffs. Information is provided in detailed levels in Standard Army Management Information System (STAMIS) report format where appropriate. It is also able to provide emulated STAMIS data feeds to the

Battle Command Sustainment Support System (BCS3). JDLM can run in a stand-alone mode, driving just logistics staffs, or can be linked to the CBS to drive combat commanders and their logistics staffs. This allows the combined arms team to cope with realistic logistics constraints.

Tactical Simulation (TACSIM) is a military intelligence training simulation used worldwide to provide training in the intelligence analysis, collection management, and intelligence portion of battle command. TACSIM accomplishes this mission by simulating and/or stimulating a wide spectrum of intelligence operations to include communications intelligence (COMINT), electronic intelligence (ELINT), imagery intelligence (IMINT), and human intelligence (HUMINT). While TACSIM can operate in a stand-alone mode, it typically works in conjunction with other simulation models, such as CBS and Digital Battle Staff Sustainment Trainer (DBST), to support multi-echelon collective training. In addition, TACSIM fully interfaces with virtual systems employing Multiple Unified Simulation Environment (MUSE)/Air Force Synthetic Environment For Reconnaissance And Surveillance (AFSERS) like META-VR (UAV), and the Synthetic Imagery Generation System (SIGS) to garner greater fidelity of intelligence systems. TACSIM stimulates most active Army, multi-service, and national intelligence sensors and stimulates training audience organizational ABCS equipment such as the All Source Analysis System (ASAS).

Digital Battle Staff Sustainment Trainer (DBST) allows ABCS to interface with training simulations in major brigade Command Post Exercises (CPX) in a staff exercise environment. DBST uses Joint Combat and Tactical Simulation (JCATS) as the maneuver driver and is currently being used as a rehearsal tool by units preparing for NTC and JRTC rotations. DBST simulates all ABCS, various intelligence, surveillance and reconnaissance systems, and the Force XXI Battle Command Battalion/Brigade and Below (FBCB2). The CTCs are using DBST to support rotational units with wraparound scenario data and digital higher headquarters which allows a commander to fight his live unit at the same time he is fighting a simulated deep enemy or operating with simulated friendly units on his flanks.

Army Constructive Training Federation (ACTF) is the next generation simulation being developed to provide U.S. Army command and staff training and the land component for joint training. ACTF will use advanced modeling and simulation techniques to train Army divisions through echelons above corps commanders and battle staffs.

One Semi-Automated Forces (OneSAF) is a composable, next generation Computer Generated Force (CGF) that will represent a full range of operations, systems, and control process from entity to brigade level, with variable level of fidelity and support for all models and simulations domain (Advanced Concepts and Requirements (ACR), research, development, and acquisition (RDA), Training, Exercises, and Military Operations (TEMO)) applications with an emphasis on human-in-the loop and no-human-in-the-loop. It also will represent the physical environment and its effect on simulated activities and behaviors. OneSAF will be the future entity level brigade and below constructive simulation. It will be interoperable with The Army Constructive Training Simulations and part of the ACTF. OneSAF will be interoperable with Army Battle Command System (ABCS) and FBCB2. OneSAF will replace Janus-T and CCTT and AVCATT SAFs and interoperate with CCTT/AVCATT simulators. It will interoperate with OIS/HITS. OneSAF enables a seamlessly

integrate LVC simulations into realistic synthetic battlespaces. OneSAF will represent C4I, combat, CS, and CSS. Its fielding will significantly reduce exercise overhead. OneSAF will be incorporated into the ACTF after it is fielded.

Synthetic Environment Core (SE Core). SE CORE integrates OneSAF into the CCTT and AVCATT. It will provide for the generation of run time databases for CCTT and AVCATT that are formatted to provide other virtual simulators with a master set of available databases. Virtual TADSS will interact with live and constructive TADSS and with the Joint training community through SE Core's interaction with the LVC IA.

Nonsystem TADSS that Support the Combat Training Centers (CTC)

Digital After Action Review Tool (DAART) enables the CTC instrumentation system to monitor digitized unit communications and collect digital data to prepare the AAR for digital units. This program is critical in providing a bridge between the current and Objective instrumentation Systems (OIS). It enables the CTC current instrumentation systems to collect digital data for the preparation of AARs for ABCS-equipped units.

CTC Battle Command (BC) Security. CTCs are required to be able to connect to ABCS for the purpose of (1) playing the higher headquarters and adjacent units; (2) extracting critical information from the ABCS for the purpose of AAR and take home package (THP) development; (3) maintaining safety during the exercise; (4) and controlling the exercise. Instrumentation and AAR product systems (such as DAARTs) are currently required to operate in the Secret System High (SSH). CTC BC Security provides a capability to allow CTC instrumentation and support systems (such as DAARTs, OIS, etc.) to be connected to the rotational unit's ABCS. CTC instrumentation and other supporting systems were developed as training devices and as such, were not considered automated information systems (AIS). The increasing use of automated systems to support command and control functions, and changes in the regulations concerning information assurance have resulted in new requirements for certification and accreditation of CTC instrumentation and supporting systems. The security environment at each CTC must be significantly upgraded to continue to support realistic training by rotation units.

National Training Center Objective Instrumentation System (NTC-OIS) replaces aging components and provides a fully instrumented battlefield with feedback on position location and weapons engagements. It is CTIA-based and OneTESS-compliant and provides digital functionality. It serves as a basis for JRTC and Combat Maneuver Training Center systems. Fielding is in FY07.

Common Training Instrumentation Architecture (CTIA) is a component-based architecture that uses common standards, interfaces, and protocols with other STE training systems. Along with the OneTESS, CTIA is the foundation of the Army's Live Training Transformation (LTT) product line for training instrumentation systems that support home station (DMPRC, MOUT, force-on-force, etc.), deployed and maneuver CTCs live training requirements. CTIA's common component-based architecture approach ensures cost-effective modernization in support of digital Current and Stryker training instrumentation systems and will evolve to support Future Force's training requirements.

Combat Maneuver Training Center-Objective Instrumentation System (CMTC-OIS) replaces aging components. It is CTIA based and OneTESS-compliant, and provides digital functionality. Failure to fund will result in lack of a replacement system for CMTC instrumentation system, which reaches wear out in FY08. CMTC-OIS will support digital and analog units training at the CMTC by integrating C4I and virtual and constructive simulations and be able to link external sources such as home station, schools, and joint exercises.

Joint Readiness Training Center Objective Instrumentation System (JRTC-OIS) replaces aging components of the current instrumentation system. JRTC-OIS will support digital and analog units training at the JRTC by integrating C4I and virtual and constructive simulations and be able to link external sources such as home station, schools, and joint exercises. It is CTIA-based and OneTESS-compliant, and provides digital functionality. This is the replacement system for JRTC instrumentation system, which reaches wear-out in FY10.

NTC Live Fire Targets provides for the development and acquisition of replacement targets systems on the live fire ranges. Program will replace existing target systems with state-of-the-art capabilities; integrate and be compliant with NTC OIS live fire C2; and improve the C2 target array.

OPFOR Surrogate Tank Vehicle (OSTV)/ OPFOR Surrogate Vehicle (OSV). Both are based on the M113A3 chassis with visual modifications to include an OSV turret that is driven by Bradley Fighting Vehicle components. Excess M60 thermal sights are utilized. The OSTV replaces M551 Sheridan and M60 tanks used as surrogate tanks and the OSV replaces M551s and M113s used as surrogate BMPs. These systems will be fielded to NTC, JRTC and CMTC.

OPFOR Combat Wheeled Vehicle. A change in the operational environment reduces the number of combat tracked vehicles but increases wheeled systems. These systems reflect changing real-world conditions and provide full-spectrum capability to the maneuver CTC OPFORs. This includes both tactical and technical vehicles.

OPFOR Aviation provides OPFOR rotary wing aviation and Unmanned Aerial Vehicles (UAVs) that replicate emerging threats. UH-1s are aging, near wear out, and scheduled to leave the inventory in FY08. There is no UAV program for OPFOR. These systems will replicate real world conditions and provide full spectrum capability to the maneuver CTC OPFORs.

OH 58D TESS is needed to support aviation systems during normal rotations (NTC, JRTC and CMTC) as well as at the Joint Air-Ground Center of Excellence (JAGCE). OH 58D TESS would allow realistic play and provide valuable AAR feedback.

Nonsystem TADSS that Support the Institutional Domain

Basic Electronics Maintenance Trainer (BEMT) provides basic electronics training of missile electronics repair and test, measurement and diagnostic equipment repair at Ordnance Missile and Munitions Center and School, Redstone Arsenal, and electronics maintenance repairer training at the Ordnance Electronic Maintenance Training Department at Fort Gordon.

Institutional Digital Education Plan (IDEP) integrates ABCS training throughout TRADOC centers and schools to support and sustain the U.S. Army's digitization strategy with

appropriately trained Soldiers and leaders. The IDEP describes the intent for transition from the current New Equipment Training Team/ Central Technical Support Facility-based training system into the long-term solution—the TRADOC institutional training system. It identifies a digital training model and defines the categories of ABCS training appropriate for integration into TRADOC institutions through resident and distance learning applications, and defines the anticipated end state for the training system and a transition plan to reach the objective system.

CTC MCA Projects

NTC MOUT Combined Arms Collective Training Facility. To support the contemporary operational environment, NTC requires a MOUT site of sufficient size to support combined arms brigade-level operations.

NTC "Star Wars" Building. NTC will require a new Training Analysis Facility (TAF) to house their new Objective Instrumentation System.

BCTP Seminar Facility. With the demolition of Bell Hall in FY05, BCTP loses their seminar facility located in that facility. A seminar facility is required to adequately train division and corps staffs prior to their BCTP warfighter exercise.

CMTC "Star Wars" Building. CMTC will require a new training analysis facility to house their new Objective Instrumentation System.

NTC Railspur. NTC requires a rail spur to facilitate deploying and redeploying units to more efficiently use the NTC. Additional railhead space is required for larger numbers of deploying and redeploying vehicles necessitated by the downsizing of the PREPO fleet. Additionally, it supports NTC mobilization missions.

NTC Land Expansion. In the 20 years that NTC has been in operation, the speed and power of weaponry have increased significantly, requiring larger training areas. The House Armed Services Committee expanded the NTC by adding over 110,000 acres of open maneuver space in a manner that recognizes the Army's critical training needs as well as the needs of the environment. The Departments of Defense and Interior will look at a variety of conservation measures—such as acquisition of private and state lands; construction of barriers, fences, and other structures; and funding of research studies—to ensure compliance with the Endangered Species Act. The NTC Instrumentation System, to include Observer/Controller Communications, will require expansion to include Military Construction Army (MCA) projects.

JRTC Administrative/Operations Facilities. Based upon OPS GRP expansion to support third rotational TF, JRTC will need additional administrative and TAF facilities.

JRTC Vehicle Maintenance Facility/ Hardstand. This facility will be used to support O/Cs during rotations in the southern portion of the training area. This training area includes the intensive use area (IUA) and limited use areas (LUA). Facilities will reduce O/C travel time for maintenance of their vehicles.

JRTC AAR TRIPLEX. This facility (located on South Fort) is able to conduct three AARs simultaneously. This facility is used to support AARs for rotational units, thus cutting down on travel time to more distant main post facilities.

JRTC Forward Operating Base (FOB). Current FOB is housed in WWII billets that are scheduled for demolition. A new FOB is needed in a secure location (away from

BLUFOR). FOB is needed to provide required SOF play during rotations.

Critical Operations and Maintenance, Army (OMA) Project

JRTC Land Use Area. This additional area is critical to the continued success of the JRTC to accomplish its mission to train the Army's light fighting forces, including three battalion Brigade Combat Team conventional rotations and SBCT rotations, which require a 50kmX50km battlespace. Annual recurring requirements are needed to sustain use of LUA training lands and land use agreements with the U.S. Forest Service.

Conclusion

Army training must change to remain relevant as changes occur in the operational environment. The Army must train Soldiers and units for situations and missions they will face today and in the future. The Army must provide leaders, Soldiers, and units tough, realistic, multi-echeloned, and fully integrated training that will produce bold and innovative leaders to deal with complex situations, flexible Soldiers with the warrior ethos, and well-trained units. Soldiers of the 21st century will be expected to achieve these results across the full spectrum of operations. The nature of future threats demands that the Army place its highest priority on training the nation's Soldiers.

People are central to the Army—they are the keys to achieving ready forces today and a transformed Army tomorrow. Effective Soldiers and leaders—those who are self-aware, adaptive, and innovative—will solve unforeseen operational problems. Developing and maintaining this edge in the human dimension is critical to the success of Army Transformation and sustaining day-to-day operational readiness. The Army is committed to the development of its leaders at all levels. This commitment extends equally to all officers, warrant officers, NCOs, and Department of the Army civilians of the Active Army, Army National Guard, and U.S. Army Reserves. Leaders must be appropriately developed before assuming and while occupying leadership positions to ensure they are competent in and confident of their ability to lead at the level assigned. In short, the goal is to develop competent, confident leaders who can exploit the full potential of present and future doctrine.

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ANNEX D: MATERIEL

Introduction

This annex provides a brief description and status of key Army materiel programs contained in the Fiscal Year 2005 President's Budget (PB05). These programs develop and field new equipment systems, provide incremental improvements to existing systems, or recapitalize existing fielded systems by rebuilding to a zero miles/hours condition and upgrading system capabilities.

These materiel programs are part of a comprehensive and integrated Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) modernization solution to execute the Army's core competencies: (1) train and equip Soldiers and grow leaders, and (2) provide relevant and ready land power capability to the Combatant Commander as part of the joint team.

Equipping Objectives

Army equipping efforts are focused to support the following objectives:

- Support current operations. Ensure Soldiers deployed or scheduled to deploy in support of operations are equipped with the critical equipment and materiel needed to execute assigned missions.
- Equip the highest priority units (ALO 1) at a required = authorized level with critical equipment and materiel needed to execute assigned missions.
- Recapitalize the Current Force, to include RC forces. This includes actions to reset the Current Force.
- Develop capabilities consistent with joint interdependence and conducting operations in a joint, interagency, and multinational (JIM) environment. Accelerate spiral development and fielding of Future Force capabilities to insert them where feasible into the Current Force.
- Field Stryker, Future Combat Systems, and other systems by Unit Set Fielding (USF) to meet established timelines for achieving an initial operational capability (IOC) for the unit and its interdependent system of systems set.
- Continue modernization efforts for two current force divisions (4ID and 1 CAV), 3rd ACR, selected units in the digitized III Corps, and Army Special Operations Forces (ARSOF).
- Support Army initiatives that require equipping solutions (i.e., modularity, network, AC/RC balance, joint logistics).

These objectives are supported by a host of initiatives and plans that include Rapid Fielding Initiative (RFI), Rapid Equipping Force (REF), setting the force/reset plans, Stryker Brigade Combat Team (SBCT) and Unit of Action (UA) USF plans, recapitalization plans, Software Blocking, modularity and force stabilization plans, AMEDD transformation initiatives, Army Materiel Command (AMC) restructuring, logistics transformation initiatives,

infrastructure plans, and Unit Focused Stability and rotation plans. Most of these initiatives and plans are highlighted throughout the *2004 Army Modernization Plan*.

The Acquisition Phases and Developmental Processes

The materiel programs described in this annex are in various phases of the acquisition management life cycle. Figure D-1 depicts the acquisition management process and management milestones for reference. Both the new and old terms are provided because programs initiated under the old life-cycle model still use those terms. Definitions for these phases and other acquisition terms can be found in the Department of Defense (DOD) 5000 Defense Acquisition Policy Documents.

Evolutionary acquisition is the DOD preferred strategy being used by the Army to rapidly acquire materiel systems with mature technologies for the user. This strategy delivers capabilities in increments, with the recognition that future improvements in capability will be needed. The objective is to balance needs and available capability with resources, and to put capability into the hands of the user quickly. Success of this strategy is dependent upon consistent and continuous definition of requirements, maturation of technologies, and continuous collaboration between the user, tester, and developer to develop and produce systems with increasing capability towards a materiel concept. Figure D-2 depicts this requirements and acquisition process.

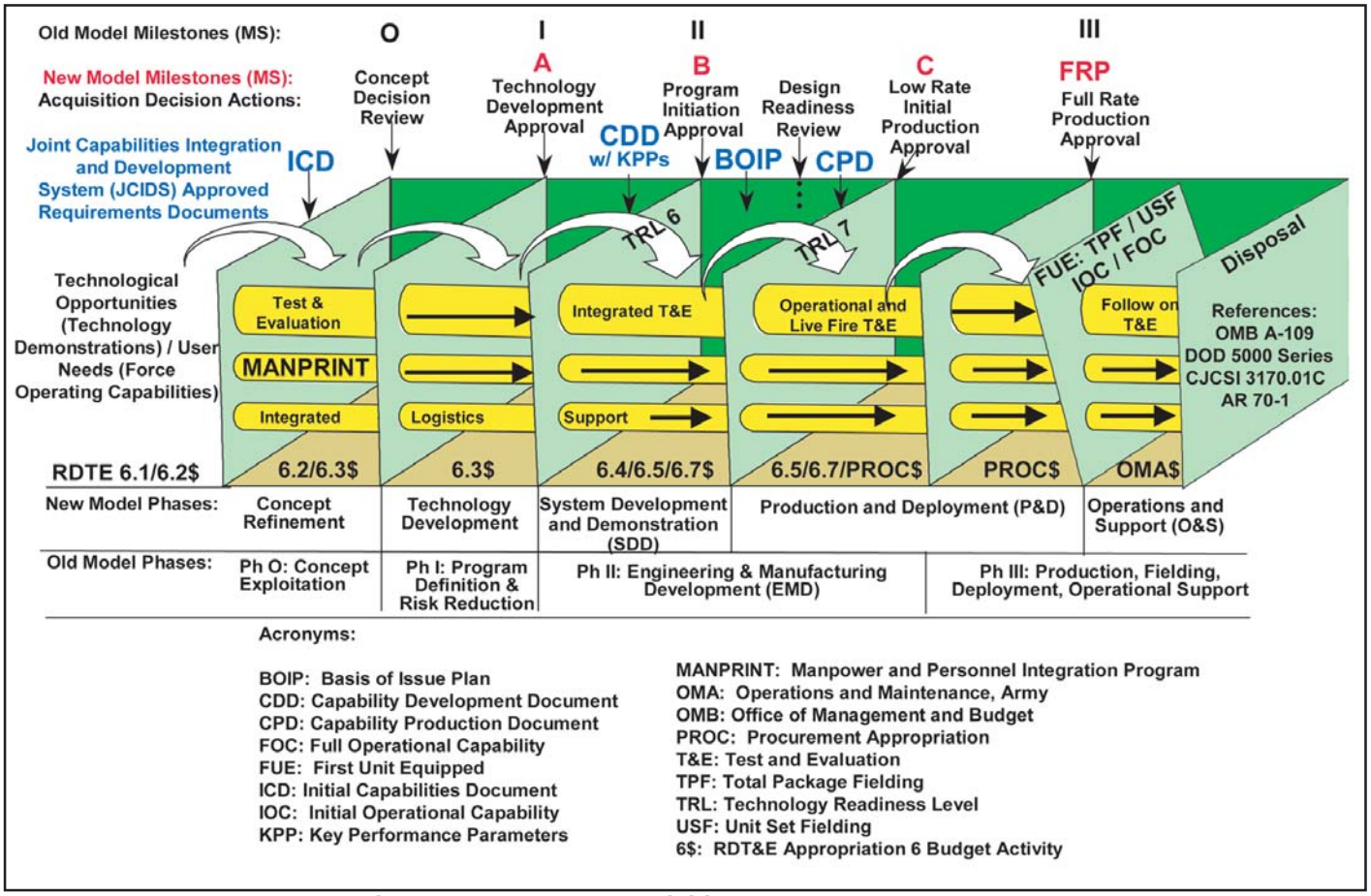


Figure D-1. System Acquisition Management Process

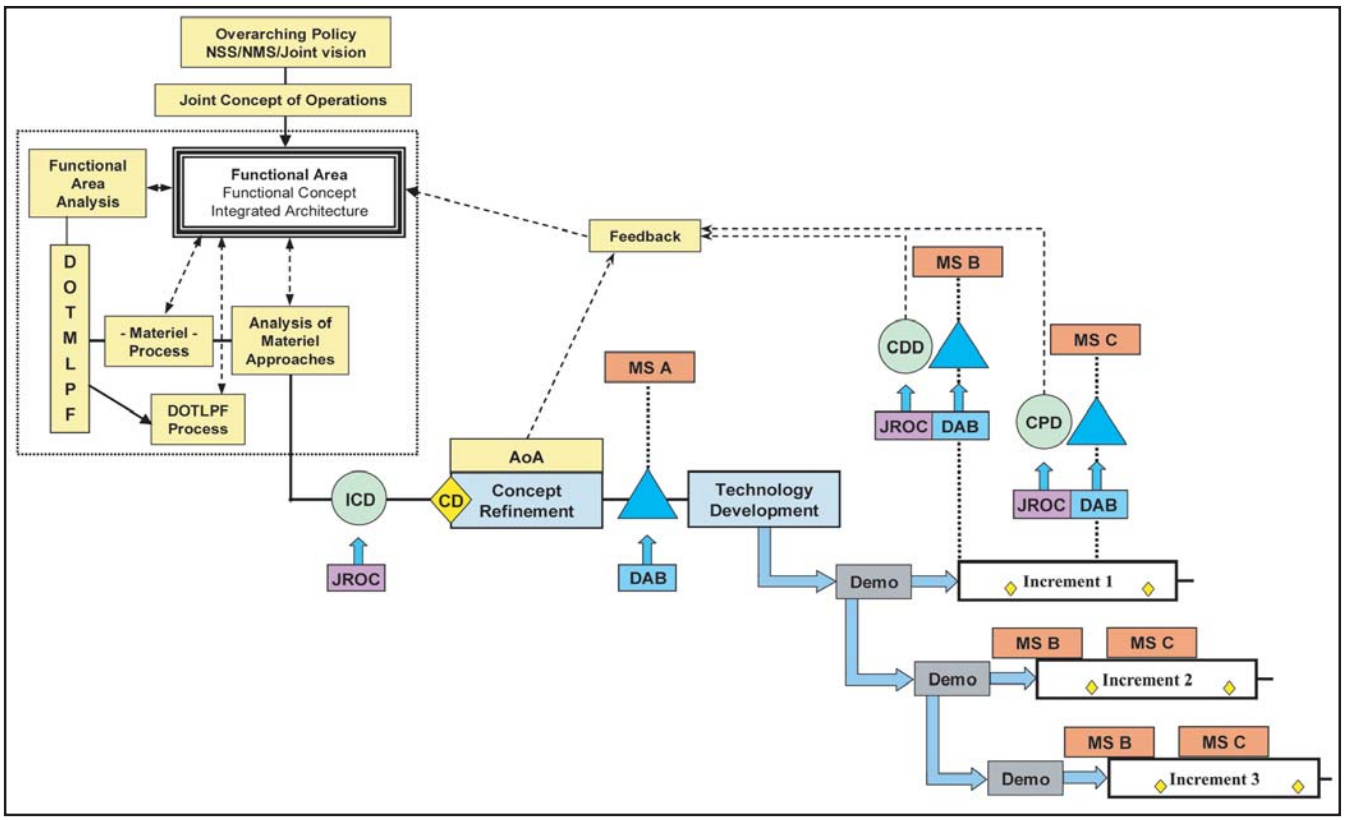


Figure D-2. Requirements and Acquisition Process

Evolutionary acquisition uses two key processes, incremental and spiral development, to provide for continuous discovery and development of technology for military applications that enhance Joint Force capabilities.

Through the incremental development process, a desired capability is identified and the required end state is defined. That requirement is met over time by the development of several increments, each dependent on available mature technology. The requirement for future increments is based upon the ability to fill the gap between the current capability and the objective capability (100 percent design concept) for a system.

Through the spiral development process, a desired capability is identified, but the end-state requirements are unknown at program initiation. Those requirements are refined through experimentation, risk management, and continuous user feedback to provide the best possible capability within an increment. The requirement for future spiral development is dependent upon user feedback and technology maturation.

Both spiral and incremental development require close coordination between materiel and training developers to ensure training products and plans are developed to support the new capabilities provided by each increment and any spiral developments applied outside an increment cycle to existing systems.

Developing Capabilities for the Future Joint Force

The Army is modernizing its Current Force to remain a relevant and ready component of the Joint Force that meets near-term operational challenges while continuously pursuing truly transformational changes to develop a Future Force over time. The Joint Capabilities

Integration and Development System (JCIDS) is the new top-down joint capabilities-based requirements generation process that will guide Army and the other Services' investment in transformational capabilities for the future Joint Force. The Joint Operations Concepts (JOpsC) is the first step in this process that translates strategic guidance to desired joint capabilities. It is an overarching concept and construct that provides the operational context for transformation by linking strategic guidance with the integrated application of Joint Force capabilities. The JOpsC describes how the Joint Force intends to operate 15-20 years in the future across the entire range of operations.

The JOpsC is a unifying framework for developing supporting Service concepts, subordinate joint operational, functional, and integrating concepts, and a set of integrated operational, technical, and system architectures that look at existing, evolving, and future Joint Force requirements. These concepts and architectures will be validated through joint analysis, experimentation and lessons learned to guide future joint and Service led modernization efforts.

Joint Functional Concepts

There are five appendices to this annex. Each appendix is aligned with one of the five functional concepts of Force Application, Protection, Focused Logistics (FL), Battlespace Awareness (BA), and Command and Control (C2). Each functional concept describes the approach for providing a particular military capability across the range of military operations. Under JCIDS, the J8 is using these functional capability categories to focus joint analysis. Programs that provide more than one functional capability are assigned a lead functional capability working group with one or more supporting working groups to do the analysis up front of proposed concepts and DOTMLPF solutions. A designated Functional Capability Board (FCB) that is also aligned with one of these five emerging joint functional concepts, validates this analysis and forwards recommendations

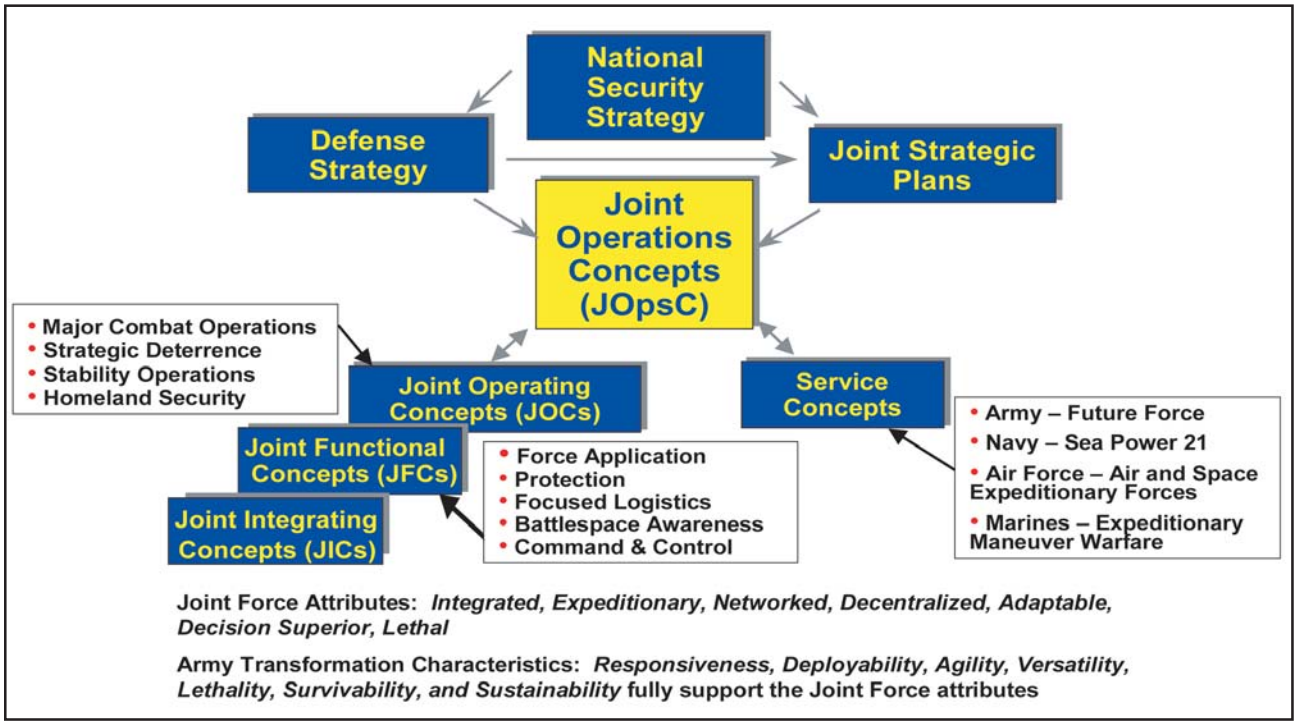


Figure D-3. Joint Operations Concepts (JOpsC) Framework

to the Joint Requirements Board and Joint Requirements Oversight Committee that provides top-down guidance and direction to the Services on their modernization programs. The JCIDS process is continuing to evolve and further delineations are expected of the functional concepts (i.e., addition of Net-Centric Operations, other).

In this annex, Army materiel programs with more than one functional capability are described only once within a functional capability appendix that best follows the current portfolio of the five FCBs as described below and as binned in the equipping resourcing framework used to organize the Army equipping program.

Force Application capabilities are those that cause an effect on the enemy. The Force Application FCB portfolio includes land, maritime, information, space, psychological, deception, and special operations; joint targeting and fires; conventional, nuclear, and electronic attack; and suppression against enemy air defense. Appendix 1, Force Application, provides a description and status on the following PB05 funded materiel programs:

Aviation Modernization:

AH-64 Apache
UH-60 Black Hawk
CH-47 Chinook
Fixed Wing
Hellfire (HF) Family of Missiles
Joint Common Missile (JCM)
Advanced Precision Kill Weapon System (APKWS)
Aircraft Survivability Equipment (ASE)
Aviation Electronics (Avionics)
Aircrew Integrated Systems (ACIS)
Air Traffic Services/Air Traffic Control (ATS/ATC)
Air Ground Support Equipment (AGSE)
Aircraft Component Improvement Program (ACIP)
Aviation Training Aids, Devices, Simulators, and Simulations (TADSS)

Soldier Modernization:

Land Warrior (LW)
Mounted Warrior (MW)
Air Warrior (AW)
Enhanced Night Vision Goggles (ENVG)
Thermal Weapon Sights ((TWS)
XM29 Rifle, Integrated Airburst Weapon System
XM307 Objective Crew Served Weapon (OCSW)
Nonlethal Capabilities Set (NLCS)

Ground Force Modernization:

Abrams Tank
Bradley Fighting Vehicle (M2/M3)
Stryker Family of Vehicles
Lightweight 155 Howitzer (M777)
Future Combat Systems (FCS)
Non-Line-of-Sight Cannon (NLOS Cannon)
Non-Line-of-Sight Launcher System (NLOS-LS)
High Mobility Artillery Rocket System (HIMARS)
Army Tactical Missile System (ATACMS) Family of Munitions
Chemical Energy Missiles (Javelin and TOW 2B)
Guided Multiple Launch Rocket System (GMLRS) Rocket
120mm XM395 Precision Guided Mortar Munition (PGMM)
Excalibur (Extended Range 155mm Munition)
Kinetic Energy Missiles [Line-of-Sight Anti-Tank (LOSAT) and Compact Kinetic Energy Missile (CKEM)]
Mid-Range Munition (MRM-KE or MRM-CE)

Protection capabilities prevent an enemy's effect on us. The Protection FCB portfolio includes personnel and infrastructure

protection; nonproliferation and counter-proliferation; and consequence management. Appendix 2, Protection, provides a description and status on the following PB05 funded materiel programs:

Air and Missile Defense (AMD) Modernization:

Patriot (PAC-3)
Medium Extended Air Defense System (MEADS)
Terminal High Altitude Area Defense (THAAD)
Ground Based Midcourse Defense (GMD) Segment
Sentinel Radar System
Surface Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM)
Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)
Mobile Tactical High Energy Laser (MTHEL)
Joint Tactical Ground Station (JTAGS) Multi-Mission Mobile Processor (MP3)

Chemical, Biological, Radiological, Nuclear, and High Yield Explosives (CBRNE) Defense Modernization:

Vehicle Obscuration Smoke Systems (M6 and M7)
M56 Wheeled Smoke System (Coyote)
Chemical Biological Protection Shelter (CBPS)
Collectively Protected Deployable Medical System (CP DEPMEDS)
Joint Vaccine Acquisition Program (JVAP)
Joint Service General Purpose Mask (JSGPM)
Joint Service Lightweight Integrated Suit Technology (JLIST)
M93/M93A1 Nuclear, Biological, Chemical Recon System (Fox)
M31/M31A1/M31E2 Biological Integrated Detection System (BIDS)
Stryker NBCRV (NBC Recon Vehicle)
Joint Biological Standoff Detector System (JBSDS)
Joint Portal Shield Detector System (JPS)
Joint Chemical Agent Standoff Detection System (ARTEMIS)
Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD)
Joint Chemical Agent Detector (JCAD)
Joint Service Lightweight NBC Recon System (JSLNBCRS)
Joint Warning and Reporting System (JWARN)
Joint Service Family of Decontamination Systems (JFSDS)
Joint Service Sensitive Equipment Decontamination (JSSED) System
Sorbent Decontamination System (M100)
Joint Biological Agent Identification and Diagnostic System (JBAIDS)
Non-invasive Filler Identification (NFI) System
Large Improvised Explosive Device (IED) Countermeasures Family of Systems
Man-Transportable Robotic System (MTRS)

Focused Logistics (FL) capabilities sustain and support the force. The FL FCB portfolio includes deployment distribution; sustainment; medical; mobility; and logistics command and control. Appendix 3, Focused Logistics, provides a description and status on the following PB05 funded materiel programs:

Lift Equipment Modernization:

Theater Support Vessel (TSV)
Precision, Extended Glide Airdrop System (PEGASYS)

Assured Mobility Modernization:

AN/PSS-14 Handheld Mine Detection System (HSTAMIDS)
Ground Standoff Minefield Detection System (GSTAMIDS)
Improved Ribbon Bridge (IRB)
Rapidly Emplaced Bridge System (REBS)
Dry Support Bridge (DSB)

Sustainment Modernization:

Transportation Coordinator's Automated Information for Movement System II (TC-AIMS II)
Movement Tracking System (MTS)
Battle Command Sustainment Support System (BCS3)
Global Combat Service Support (GCSS) Army
Combat Service Support Automated Information System Interface (CAISI)
Authorized Stockage List Mobility System (ASLMS)
Tactical Electric Power (TEP)
Standard Automotive Tool Set (SATS)
Family of Medium Tactical Vehicles (FMTV)
High Mobility Multi-Purpose Wheeled Vehicle (HMMWV)
Heavy Expanded Mobility Tactical Truck (HEMTT)
Palletized Load System (PLS)
Rapid Manufacturing System (RMS)
Forward Repair System (FRS)
Lightweight Water Purifier (LWP)
Future Tactical Truck System (FTTS)
Unit Water Pod System (CAMEL)
Load Handling System (LHS) Compatible Water Tank Rack System (HIPPO)
Load Handling System Modular Fuel Farm (LMFF)
Rough Terrain Container Handler (RTCH)
Maintenance Support Device (MSD)
Medical Communications for Combat Casualty Care (MC4) System
Force Provider (FP)

Battlespace Awareness (BA) capabilities collect, analyze, and process battlespace information. The BA FCB portfolio includes: all source intelligence collection; environmental data collection; predictive analysis; and knowledge management. Appendix 4, Battlespace Awareness, provides a description and status on the following PB05 funded materiel programs:

Distributed Common Ground System-Army (DCGS-A)
All Source Analysis System (ASAS)
Aerial Common Sensor (ACS)
Advanced Field Artillery Tactical Data System (AFATDS)
Long-Range Advanced Scout Surveillance System (LRAS3)
Tactical Exploitation System (TES)
Integrated Meteorological System (IMETS)
Prophet
Tactical Unmanned Aerial Vehicle (TUAV) Shadow 200
Phoenix Battlefield Sensor System (PBS2)

Command and Control (C2) capabilities plan, prepare, and direct execution of missions. The C2 FCB portfolio includes common operational picture; Joint C2; communications and computer environment; and own force information collection. Appendix 5, Command and Control, provides a description and status on the following PB05 funded materiel programs:

Army Battle Command System (ABCS)
Global Command and Control System-Army (GCCS-A)
Maneuver Control System (MCS)
Air and Missile Defense Command and Control System (AMDCCS)
Force XXI Battle Command Brigade and Below (FBCB2)
Grenadier BRAT (GB) and Mini-Transmitter (MTX) Blue Force Tracking System
Satellite Communications (SATCOM)
Global Positioning System (GPS)
Single Channel Ground and Airborne Radio System (SINCGARS)
Warfighter Information Network-Tactical (WIN-T)
Joint Tactical Radio System (JTRS)
Army Common User System (ACUS) Modernization Program [Mobile Subscriber Equipment (MSE) and Tri-Service Tactical Communications System (TRI-TAC)]

Appendix 1: Force Application

Force Application is the sum of all actions taken to cause desired effects on our adversary. Force Application encompasses all aspects of fires and maneuvers that suppress, neutralize, seize, or destroy an objective. These effects are conducted with precision, in time, sequence, location, duration, and intensity, in order to apply immediate and continuous pressure on enemy capabilities. These actions occur in all domains; land, maritime, space and cyberspace; and include conventional and unconventional operations using conventional weapons, nonlethal weapons, or nuclear weapons. These actions are enabled by offensive information operations (IO).

The Joint Force—adept at overcoming anti-access and area denial strategies, attacking throughout the depth and breadth of the battlespace, and defeating fixed and mobile targets in all terrain and weather conditions across the full spectrum of conflict—requires a broad range of Force Application capabilities. The Army provides significant Force Application capabilities through sustained land dominance using conventional and unconventional air and ground maneuver forces that gain and maintain a positional advantage with decisive speed and overwhelming operational tempo (OPTEMPO). This dominant maneuver capability enhances the timeliness, range, precision, and impact of joint fires. Enabled by space, airborne, and ground-based systems that provide robust C4 and ISR and an enhanced suite of kinetic and nonkinetic munitions, the Army provides lethal and precise fires for the Joint Force Commander (JFC).

In conjunction with the Joint Force, the Army provides full-spectrum forces able to integrate maneuver, fires, and IO across the full range of military operations, including conducting operational maneuver from strategic distances; conducting mobile strike operations; closing with and destroying enemy forces; applying precision fires and maneuver; exercising information superiority; commanding and controlling joint and multinational forces; and providing direct, continuous, and comprehensive control over terrain, resources, and people.

The Army is equipping the Soldier to continue to provide Force Application capabilities required in the evolving security environment. This appendix provides a brief discussion of the Army's Force Application capabilities that provide the Joint Force dominant air and ground maneuver coupled with precision engagement and the key materiel programs associated with these capabilities. While materiel programs that support operational maneuver from strategic distances and assure mobility are Force Application capabilities supporting dominant maneuver, these programs are described in this annex under Appendix 3, Focused Logistics, given that deployment distribution and mobility are areas within the current FL FCB portfolio.

Aviation Capabilities

Aviation's strength is its ability to deploy quickly, maneuver rapidly, focus tremendous combat power, and achieve surprise and positional advantage. It is instrumental in achieving simultaneous, distributed, continuous, combined arms air-ground operations.

With its manned and unmanned assets, aviation organizations develop situations out of contact, maneuver to positions of advantage, engage enemy forces beyond the range of their weapons, destroy them with precision fires, and provide close support. Its inherent mobility, flexibility, agility, lethality, and versatility are instrumental in enabling the air-ground task

force commander to conduct decisive joint operations.

Aviation conducts maneuver, maneuver support, and maneuver sustainment operations across the spectrum of conflict. Highly skilled and knowledgeable aviation Soldiers, employing aviation systems from entry operations to decisive action, provide a significant contribution to the quality of firsts (see first, understand first, act first, and finish decisively). Aviation operations develop the common operating picture (COP), shield the maneuver force, shape the battlefield, extend the tactical and operational reach of the maneuver commander, and sustain the force. Aviation is critical to the Army's stability and support requirements, to include the homeland security requirements of our nation. Modernization and sustainment of Army Aviation ensures these capabilities are maintained.

Aviation Modernization

Aviation modernization and recapitalization of existing aviation systems projected to remain in the fleet into the 2015-25 time frame are essential to supporting current as well as future operations. The urgent need to address the steadily deteriorating condition of the aviation fleet and accelerate RC modernization is being addressed through an Aviation Transformation initiative. This initiative:

- Rapidly accelerates Active and Reserve Component (AC and RC) aviation modernization efforts this decade
- Aligns aviation structure and resources to comply with Future Force requirements
- Accelerates divestiture of nonmodernized aircraft (AH-1, UH-1 and OH-58A/C)
- Restructures and standardizes attack and lift formations across the force
- Adjusts RC stationing and alignment to better fit the Army's force structure and mission focus for Reserve forces
- Leverages new training technologies to maintain crew proficiency
- Invests in improvements for aircraft reliability/maintainability

The last several years have seen great progress in modernizing Army Aviation. Fielding of the AH-64D Longbow Apache is well underway. Recapitalization programs for the CH-47 Chinook and UH-60 Black Hawk begin production in the near term. The OH-58D Kiowa Warrior, planned to remain in the fleet until the 2012 time frame, is being provided safety enhancements and software upgrades to maintain compatibility with the ground force. Fixed wing is retiring its aging fleet of C-12 and RC-12 aircraft and modernizing with Global Air Traffic Management (GATM) as well as other safety and cockpit management systems for those aircraft that will remain in the inventory. The Army is successfully retiring aging and obsolete aircraft from the force, and lessons learned from previous and current military operations and deployments are being addressed. The Army is continuing to examine the best means to achieve the vertical envelopment capability required to rapidly project the Units of Action across difficult or distant geographic locations. An Air Maneuver and Transport concept (previously referred to as Joint Transport Rotorcraft) represents one solution for an organic Army system. Future Force requirements for a robust, fully modernized aviation force are continuing to be developed.

Unmanned Aerial Vehicle Systems (UAVS)

As the Army transforms to a more flexible, responsive, and lethal Future Force, Army UAVS will also transform to provide integrated, responsive, and lethal capabilities to commanders at all echelons from the Current to Future Force. Future commanders will require a UAVS with a command and control capability that facilitates the flexible and rapid application of overmatching, decisive land power at specific times and locations throughout a greatly expanded battlespace. On battlefields of the future, UAVS will support all Army echelons, across the spectrum of conflict, on varied terrain and across the Battlefield Operating Systems. Redefining the Army's UAVS requirements reflects an evolutionary process to ensure the support required for tomorrow's Army while providing the best support possible to our forces engaged in the global war on terrorism.

In Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), UAVS such as the Raven, Shadow 200 and Hunter are providing a new dimension to maneuver forces. The Raven small UAVS is being provided in theater to OEF and OIF units to enhance small unit reconnaissance, surveillance, and target acquisition (RSTA). The Shadow 200, the Army's first tactical UAV (TUAV) to go into full rate production (FRP), is also in use as it continues to be fielded to the Military Intelligence Company within the Army's maneuver brigades, including the new Stryker Brigades. The Shadow program is further described in this annex at Appendix 4, Battlespace Awareness.

The interim extended range/multipurpose (ER/MP) Hunter UAVS is fielded within three Corps Aviation Exploitation Battalions, with one UAVS company per corps consisting of six air vehicles and associated payload and ground control stations. The Hunter is a RSTA and battle damage assessment (BDA) asset providing ground forces with near real time imagery via electro-optical/infrared (EO/IR) intelligence at ranges up to 200 km. The Hunter UAVS, while being used extensively as an ISR platform, has recently been upgraded to employ weapons like Viper Strike on a test basis. The Hunter UAVS capability will be sustained until a Future Force ER/MP UAVS is fielded at the Unit of Employment (UE) level as a RSTA and C3I system.

Current UAVS modernization efforts focus on accelerating Shadow fielding and providing a small UAVS like the Raven to meet today's operational needs, accelerating Future Force UAVS development and fielding into the Current Force, continuing development of the ER/MP UAVS to replace the Hunter, and science and technology (S&T) efforts that leverage technologies for improved UAVS capabilities.

To prepare for the future operational environment, the Army is identifying the latest advances in relevant UAVS technology (airframes, payloads, payload management, as well as precision weapons delivery) and integrating these new capabilities into an architecture that is consistent with Army and DOD transformation. Extensive S&T work is also being conducted on VTOL UAVS to provide a hover and stare capability. The continued development and fielding of UAVS with advanced payloads is an important component of the Future Force's operational concept.

The Future Force will include an integrated family of UAVS that provides support from the platoon-level to the UE (Figure D-4). The FCS classes of UAVS will be fully integrated elements of the Unit of Action (UA) organic

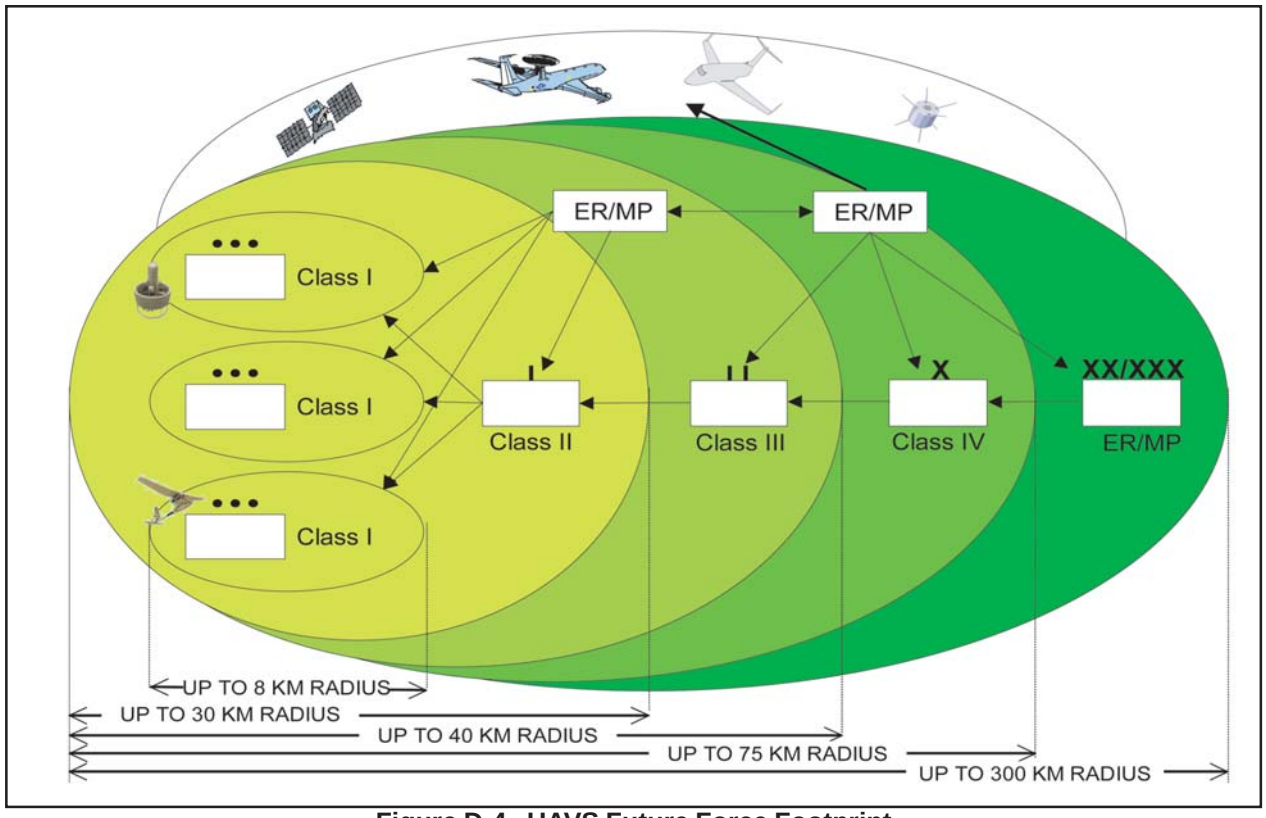


Figure D-4. UAVS Future Force Footprint

Intelligence, Surveillance and Reconnaissance (ISR) capabilities. The FCS Classes I and II UAVS will provide the small unit commander the capability to see over the next terrain feature from the squad to company level. FCS Class III UAVS will enable a variety of combat functions such as precision fires, route reconnaissance and situational development at the battalion level. The FCS Class IV UAVS will serve as the UA's ISR workhorse to facilitate situational awareness, battle command, targeting support, lethal engagement, battle damage assessment (BDA), and force protection. The FCS LSI recently selected the Northrop Grumman FireScout as the Class IV UAVS. While the path to the transformed Army of the future will focus on the Future Force, interoperability with fielded current systems will be maintained.

Future Force Aviation

The Army envisions organizing Aviation assets at all UE levels and at the UA maneuver brigade. Teaming UAVS with manned systems will enhance operational fires, maneuver, and intelligence collection capabilities for the commander. Future Force aviation modernization efforts incorporate lessons learned, the changing operational environment, and emerging Joint Force requirements. These efforts leverage key technologies in areas such as electronics, UAVS interoperability, air platforms, propulsion systems, and weaponization. These efforts include:

- Fielding FCS Classes I through IV UAVS, ER/MP and Small Unit UAVS
- Ensuring digital interoperability for effective joint/combined force operations
- Fielding effective, affordable systems that enhance aviation survivability and improve soldier stamina
- Improving aircraft operational readiness

- Developing the Joint Common Missile to replace the Hellfire (HF) air-to-ground missile system and developing a lower-cost, lighter-weight system for use against less heavily armored targets

- Replacing obsolete air traffic services equipment and maintaining compliance with future airspace usage requirements

- Digitizing Aviation Logistics and modernizing aviation ground support equipment

- Developing the technologies to ensure fielding of unmanned systems, interoperability of manned/unmanned aircraft, and Next Generation/Future System development

- Leveraging technology to reduce costs, extend aircraft service life and improve training

Army Aviation will transform into a modular, capabilities-based maneuver arm with a reduced logistics tail optimized for the joint fight. The current Army Aviation modernization plans are being reviewed and adjusted to ensure joint interoperability, modularity, deployability, and affordability.

One recent result of this review was the Army's termination of the Comanche (RAH-66) program. The Army will reprogram the Comanche funds to fix Army Aviation programs. This includes purchasing additional UH-60 Black Hawk helicopters, CH-47 Chinooks, and initiating a Block III Apache upgrade. Three new programs will be started: a Light Utility Helicopter, an Armed Reconnaissance Helicopter, and a Cargo Fixed Wing aircraft in addition to a Joint Multi-Role Helicopter program designed to leverage Comanche technology such as Fly-By-Wire, onboard maintenance diagnostics and sensor fusion advancements. We are also investing in Aviation Munitions to fund APKWS, unguided rockets and Hellfire missile procurement

Another important result of this review is restructuring of the Army's AC and RC aviation brigades to make them standardized multi-functional modular aviation formations. The new brigade design will contain two attack battalions of 48 or 60 aircraft (heavy or light division, respectively), a general support battalion of eight command and control helicopters, 12 CH-47 Chinooks, 12 medical evacuation aircraft, a self-sustaining aircraft support battalion and a Class IV UAV unit.

Discussion of Key Aviation Materiel Programs

AH-64 Apache

Description. The AH-64 Apache is the Army's heavy attack helicopter for the Current and Future Forces. Under current projections, the AH-64 Apache will remain in the fleet until at least 2020. It is assigned to attack battalions, Regimental Aviation Squadrons, and Army National Guard division cavalry organizations. Apache is a two-pilot, twin-engine attack helicopter designed to meet the current force mission requirements for reconnaissance and attack worldwide, day or night and under

obscured battlefield and/or adverse weather conditions. It is a highly mobile and lethal aerial weapons platform with an array of armaments to destroy armor, personnel and materiel. The Apache has been in the Army inventory since 1986 and an upgraded AH-64D Longbow began fielding in 1998. The AH-64D upgrades, among other improvements, adds a millimeter wave Fire Control Radar (FCR), Radar Frequency Interferometer (RFI), fire and forget radar-guided HF missile, and cockpit management and digitization enhancements. The combination of the FCR, RFI, and the advanced navigation and avionics suite of the aircraft provide increased situational awareness, lethality and survivability. The Apache focused recapitalization program integrates a number of related initiatives to produce and/or retrofit aircraft across the Apache fleet to meet the objectives of the Army's recapitalization policy and address lessons learned from recent combat operations and deployments. This program increases aircraft life by addressing high maintenance demand/O&S cost drivers and incorporating a 2nd Generation Forward Looking Infrared (FLIR) with the Modernized Target Acquisition Designation Sight/Pilot Night Vision System (M-TADS/PNVS). The program goals are to reduce the overall average airframe age of the fleet to the half-life metric of 10 years by 2010, increase the unscheduled mean time between removal by 20 percent for selected recapitalized components, and maximize the return on recapped components by 20 percent.

Program Status. The recapitalization of 501 AH-64As to the AH-64D Longbow configuration will be complete in FY06. Multi-year I delivered 232 AH-64Ds through FY02. A second multi-year contract was signed in Oct 01 for an additional 269 AH-64Ds with deliveries through FY06. Fielding of the M-TADS to the total fleet began in FY04.

UH-60 Black Hawk

Description. The UH-60 is the Army's Current and Future Force utility and medical evacuation (MEDEVAC) helicopter. The UH-60 fleet is composed of 968 UH-60As, which began production in 1977, and just over 600 UH-60Ls, which began production in 1989. Black Hawk can transport 11 fully equipped combat troops and external loads up to 8,000 lb. for the UH-60A and 9,000 lb. for the UH-60L. The UH-60 provides the force commander rapid and agile maneuver through air assault, general support, airborne C2, and MEDEVAC. It gives commanders the ability to initiate, conduct, and sustain combat operations by providing internal and/or external lift of troops, weapon systems, supplies, and equipment. In the airborne C2 role, it provides full joint and combined interoperability with other C4 and ISR elements to commanders at all echelons. The UH-60 is also heavily utilized in disaster relief operations, fire suppression, personnel recovery, and VIP transport. The UH-60 is vital to the homeland security needs of our nation.

The UH-60M/HH-60M (MEDEVAC variant) recapitalization program rebuilds and upgrades aging UH-60 aircraft to bring these aircraft up to UH-60L lift/range capabilities, reduce O&S costs, improve transportability, enhance survivability, improve strategic transportability, integrate Air Warrior, digitize avionics and flight management systems that

incorporate Global Air Traffic Management (GATM) requirements, and extend aircraft life. The UH-60M/HH-60M is expected to meet utility and MEDEVAC mission requirements until the 2025 time frame.

Another significant upgrade is the Army Airborne Command and Control System (A2C2S). This mission kit will convert selected UH-60s into an airborne tactical operations center, providing the maneuver commander a highly mobile, self-contained and reliable airborne digital command post. A2C2S will provide a rapidly deployable means of command and control that can be deployed worldwide on short notice to support missions ranging from low-intensity humanitarian assistance to high-intensity conflict.

The UH-60 modernization Operational Readiness Document (ORD) calls for a Block 2 upgrade of the fleet to a UH-60X. However, emerging analysis points toward requirements for a Future Utility Rotorcraft (FUR), with capability requirements not feasible through UH-60 upgrades. As requirements mature, it is likely that the Army will defer the validated UH-60 Block 2 requirements in favor of a new-start FUR. The FUR is envisioned to fill priority air assault, aerial MEDEVAC, special operations and general support, and airborne command and control requirements in the far term.

Program Status. The UH-60 fleet is expected to reach its current AAO of 1,680 in FY09 with the additional procurement planned as a result of Comanche termination. The UH-60M and HH-60M programs are currently in the System Development and Demonstration (SDD) Phase. The Milestone C decision is scheduled for the 2QFY05 with FUE in FY08. Initial fielding is scheduled in the Special Operations and conventional light forces. The Milestone C decision for A2C2S is scheduled for FY04 with an FRP decision in FY05. The AAO for A2C2S is 120 systems with initial fielding scheduled for III Corps and the 160th Special Operations Aviation Regiment (SOAR).

CH-47 Chinook

Description. The CH-47 Chinook is a twin-turbine, tandem-rotor, heavy-lift transport helicopter with a useful load of up to 25,000 lb. As the Army's only heavy lift helicopter, the mission of the CH-47 is to transport troops (including air assault), supplies, weapons, and other cargo in general support operations. The CH-47 is vital to the homeland security needs of our nation. Secondary missions include medical evacuation, aircraft recovery, parachute drops, disaster relief, and search and rescue. These aircraft are fielded to heavy helicopter companies and Special Operations Aviation. The CH-47F is expected to remain the Army's heavy lift helicopter until at least the 2020-2025 time frame. The CH-47 recapitalization program will provide a more reliable, less costly to operate aircraft compatible with Army digital connectivity requirements with an extended aircraft life of approximately 20 years. Key modifications integrate an upgraded T55-GA-714A engine to restore performance capability, digital avionics, Air Warrior, emerging GATM requirements, enhanced air transportability, and an Extended Range Fuel System II (ERFS II) for self-deployment missions. It will also

incorporate reliability and maintainability improvements to include airframe tuning for vibration reduction, corrosion protection, digital source collector, and replacement of 113 components. Currently there are 461 CH-47s in the inventory (427 CH-47D, 34 MH-47D/E). This program rebuilds and upgrades 301 CH-47Ds and 36 Special Operations Aviation MH-47s to the CH-47F/MH-47G configuration. The decision to recapitalize the remainder of the CH-47D fleet is dependent on funding and fielding timelines for the Air Maneuver and Transport aircraft. The impact of the decision to terminate the Comanche program results in an acceleration of this remanufacturing program; also, it adds Chinooks to equip Reserve Component companies at full authorization.

Program Status. The CH-47F completed a Milestone 0/II decision and is currently in the EMD phase with two aircraft conducting developmental and operational testing. Initial fielding is to the 160th SOAR (MH-47G), the 101st Airborne Division, and the XVIII Airborne Corps. The impact of the decision to terminate the Comanche program results in an acceleration of this remanufacturing program; also, it adds Chinooks to equip RC companies at full authorization.

Fixed Wing

Description. The Army Fixed Wing program is composed of approximately 300 aircraft. Fixed wing aircraft provide efficient, effective transportation during peacetime and wartime operations. Fixed wing aircraft provide for rapid movement of critical personnel, logistics support, and intelligence collection. Special Electronic Mission Aircraft (SEMA) collect, analyze, and disseminate signal communications and imagery intelligence in support of wartime requirements for Combatant Commanders, field commanders and National Intelligence Assets. Fixed wing aircraft are heavily utilized in disaster relief operations, air movement, (personnel, supplies), peace enforcement missions, nations assistance, civil support, counter-drug, weapons of mass destruction (WMD)/National Missile Defense (NMD), PSYOPS material delivery, security assistance, VIP transport, and homeland security.

Program Status. The UC-35 is a medium-range aircraft currently in procurement, with 26 on hand with an AAO of 67. Currently, there is one UC-35 programmed for procurement within the FY05-09 program plan. The Aerial Common Sensor (ACS) is being developed as the replacement for the SEMA RC-12 and RC-7 aircraft and is scheduled to begin fielding 60 aircraft in FY09. The ACS is described in this annex at Appendix 4, Battlespace Awareness.

The Army is currently reviewing its fixed wing requirements for the Future Force. The cornerstone of this review is gaining approval of the Fixed Wing Operational and Organizational (O&O) Plan that outlines the three major Fixed Wing missions of personnel transport, logistical support and SEMA intelligence gathering. Approval of this O&O in FY04 will enable Fixed Wing to plan and execute a balanced modernization plan to address the current inadequacies of cargo capability within its current fleet and determine the replacement for the aging C-12 (short-range aircraft) and C-23 (cargo aircraft).

Hellfire (HF) Family of Missiles

Description. HF air-to-ground missiles are employed to destroy armored and high-value point targets. Semi-active laser (SAL) HF tracks laser energy delivered by ground or airborne designators while Longbow HF uses internal millimeter wave radar frequency (RF)

for autonomous guidance. AH-64 Apache and OH-58D Kiowa Warrior utilize HF as their primary air-to-ground weapon for destruction of high-value point targets. The complementary precision-point target engagement capability of the SAL HF and the fire-and-forget, adverse weather capability of the RF HF provide the commander with flexibility across a wide range of mission scenarios, permitting fast and decisive battlefield response.

Program Status. SAL HF is no longer in production. Longbow HF completed production of 12,905 missiles in FY03 with final deliveries by FY05.

Joint Common Missile (JCM)

Description. The JCM is an air-to-surface weapon system employed from rotary and fixed-wing platforms, and potentially as a ground-launched missile, designed to target tanks, light armored vehicles, missile launchers, command, control, and communication vehicles, bunkers, buildings, and patrol boats. JCM features line-of-sight (LOS) and beyond-line-of-sight (BLOS) capabilities and can be employed in a fire-and-forget mode, providing maximum survivability, or a precision attack mode, providing the greatest accuracy and lethality. The Army is the lead Service in development and procurement of JCM as a joint program with the Department of the Navy, including the U.S. Marine Corps' (USMC's) participation, and is a cooperative program with the United Kingdom.

The JCM will be the next generation air-to-ground missile and is a candidate lethality solution for the Future Force and other joint/allied systems.

Program Status. The SDD RFP was released on 17 Sep 03, with contract award planned for the end of Mar 04. JCM will be the primary weapon system for Apache, Cobra, Hornet, and Seahawk and is planned for the FCS Robotic Vehicle Assault. Modernized Hellfire requirements are being integrated into the JCM program with the following IOCs scheduled: 2009—Apache and Cobra, 2010—F/A-18E/F, and 2011—Seahawk.

Advanced Precision Kill Weapon System (APKWS)

Description. APKWS incorporates laser guidance into the 2.75 in. Hydra-70 rocket to provide a lower-cost, lighter-weight, precision weapon capable of engaging non-armored to lightly armored targets and providing an alternative to HF against targets such as buildings, command posts, ADA sites and other targets not requiring the HF. The APKWS program provides accuracy and lethality improvements to the family of unguided rockets. The AH-64 and OH-58D will use APKWS to significantly improve aircraft stowed kill capability in scenarios requiring area/suppressive fires or precision engagement against non-armored or lightly armored targets.

Program Status. APKWS production is scheduled to begin in FY05.

Discussion of Aviation Supporting Materiel Programs

Aviation's supporting programs are essential to the support, sustainment, and modernization/recapitalization of the aircraft programs discussed above. These programs are essential to sustain and protect crews/aircraft, maintain interoperability with supported organizations, and field Future Force capabilities.

Aircraft Survivability Equipment (ASE). The Suite of Integrated Infrared Countermeasures (SIIRCM) will provide an

enhanced IR countermeasure capability to the CH-47, AH-64 and UH-60 platforms. The total SIIRCM system provides advanced missile warning with an improved countermeasure dispenser system with an enhanced flare capability. Developmental efforts continue and will culminate with the acquisition of a multi-band solid-state laser jam head capable of defeating all known and potential future IR threats. Aircraft undergoing recapitalization will have the required supporting wiring and hardware installed for the SIIRCM devices. The Army's RF guided missile protection program was reinstated in the FY05-09 program plan and will employ the same acquisition strategy as the IR program. The Army has also accelerated the fielding of critical equipment to enhance the Special Operation Forces (SOF) aircraft by equipping them with Advanced Threat Infrared Counter Measures (ATIRCM) and the Suite of Integrated Radio Frequency Countermeasures (SIRFC). The Army maintains that SOF modernization is among its highest equipping priorities, recognizing the critical role of SOF to the joint team.

Aviation Electronics (Avionics). Avionics programs are designed to ensure aviation platforms meet combined arms and joint requirements for C2, mission planning, communications, navigation (to include worldwide civil airspace), information interchange, and interoperability. Major avionics initiatives include fielding a modern airborne C2 system for the UH-60 and a digital TOC for aviation organizations (A2C2S), ensuring Force XXI Battle Command Brigade and Below (FBCB2) interoperability requirements are achieved by using the Improved Data Modem (IDM) common gateway on all aircraft; migrating from Aviation Mission Planning System (AMPS) to the Joint Mission Planning System (JMPS); providing non-line-of-sight (NLOS) communications and position tracking with the AN/ARC-220; equipping aircraft with the Joint Tactical Radio System (JTRS); fielding of improved Global Positioning System (GPS) equipment for improved weapons accuracy and navigation; and meeting mandated GATM requirements for civil airspace utilization.

Aircrew Integrated Systems (ACIS). The ACIS program develops and fields equipment required to protect, sustain, and enhance aircrew performance in sustained operations, on the ground, and during survival-evasion operations. Air Warrior is the primary ACIS program that provides integrated, modular life support equipment and chemical/biological protection, reduced weight/bulk, and significantly improved flight time in MOPP 4 gear. Air Warrior is described under the "Discussion of Key Soldier Modernization Programs" in this appendix.

Air Traffic Services/Air Traffic Control (ATS/ATC). ATS organizations must be specially equipped, highly trained, rapidly deployable on short notice, and capable of operating within the United States and international airspace. They provide the full range of air traffic services from homeland security to major combat operations. Army ATS remain the core enabler for Army airspace C2, ensuring synchronized access of the increasingly congested joint airspace. ATS/ATC modernization fields smaller, lighter, more efficient, digitally connected terminal and en route communications and precision navigation systems for tactical and fixed base operations. Major programs include the Tactical Airspace Integration System (TAIS), the Air Traffic Navigation, Integration, and Coordination System (ATNAVICS), Mobile Tower System (MOTS), Joint Precision Approach Landing System (JPALS), and Global Air Traffic Management (GATM). JPALS and GATM are mandated by civilian air control authorities and

joint services to operate within 21st century airspace.

Aviation Ground Support Equipment (AGSE). To support and sustain full-spectrum operations, aviation logistics must be as responsive and capable as the force it supports. To improve responsiveness, reduce vulnerability, and increase operational momentum, aviation must reduce the current in-theater aviation logistics footprint and digitize its logistics systems. The goal of AGSE modernization is to reduce logistical support requirements and improve aircraft operational readiness. Initiatives focus on improved automation and efficiency in three areas of development: modernization of Test, Measurement, and Diagnostics Equipment (TMDE); integration of seamless logistics management through automation systems such as the Global Combat Service Support (GCSS) Army, and replacement of aging ground support equipment.

Aircraft Component Improvement Program (ACIP). ACIP sustains engineering efforts to investigate, correct, and qualify turbine engine and Auxiliary Power Unit (APU) field-identified, safety critical and reliability deficiencies. ACIP inserts emerging technology, extends service life, drives down O&S costs, and improves readiness by keeping engines operational and on-wing. Return on investment is greater than 12:1 based on historical data using standard, approved costing models.

Training Aids, Devices, Simulators, and Simulations (TADSS). TADSS modernization is critical to the combat effectiveness of our aircrews and maintainers, and to reducing operational costs. Aviation TADSS will leverage technology to provide effective and affordable combined arms/joint training and mission planning and rehearsal simulators that are current with the aircraft/systems they replicate. Simulator concurrency, fidelity, and combined arms tactical and mission rehearsal simulators/simulations that network virtual, constructive and live simulation systems are major initiatives.

Army Aviation Summary

Army aviation's modernization efforts are focused on fixing warfighting deficiencies (particularly those uncovered during recent operations), aligning the aviation force with the Army's Future Force concept, and fielding aircraft/subsystems required to achieve full-spectrum operational capability. Aviation modernization is being achieved through force structure changes, training initiatives, and materiel modernization (AH-64D, UH-60M/HH-60M, CH-47F, UAVS, Air Warrior and other subsystem programs). Aviation is supported by S&T programs designed to provide the knowledge base required to upgrade existing aircraft and meet the challenges of new aircraft/weapon system developments. The Army's commitment to divesting current, obsolete aircraft and ensuring balanced modernization across both AC and RC is being realized through the Aviation Transformation initiative. The Army continues to review near-term aviation funding issues (aircraft survivability equipment modernization, digitization, aircraft operational readiness) to best align programs, create more executable strategies and identify acceptable risks that allow tailoring of program requirements. Future challenges are ahead with emerging GATM requirements for airspace utilization, interoperability requirements for UAVS, GCSS Army, FBCB2 and the conversion to a Future Force aviation force structure.

Ground Force Capabilities

Army ground maneuver forces with the capability to obtain a positional advantage and

bring overwhelming combat power on the enemy with joint fires are essential to joint warfighting. Committed ground maneuver forces can rob an adversary of initiative and remove their freedom to continue hostilities. Sea, air, and space dominance are invaluable, but only land dominance brings hostilities to a decisive conclusion—establishing and maintaining favorable security conditions for more comprehensive and enduring solutions to complex crises.

Our enemies seek sanctuary by hiding in protected facilities (schools, churches, and hospitals) to make it difficult for the commander who must discriminate among combatants and noncombatants. They create dug-in, camouflaged, concealed, hardened positions in caves or deep bunkers and mask these positions around innocent populations to avoid detection and attack by fires. With battlespace understanding and precision fires, Soldiers on the ground are often the only precise instrument that can locate, track, identify conflicted targets and attack them with lethal, accurate, and timely effects using sensors linked to weapon delivery systems, Soldiers and decision makers.

The ground force's dominant maneuver and organic high-volume precision fires coupled with other joint precision fire capabilities for the close fight, will overwhelm the adversary, compelling him to flee his sanctuary or face battle to avoid defeat in detail. In either case, enemy dislocation, disintegration, and destruction are inevitable through the combination of maneuver and fires enabled by ground force organic and joint ISR, and precision engagement capabilities.

Employing land force provides additional magnitudes of precision, perhaps impossible by other means, and is particularly effective in demonstrating national resolve. At ranges of just inches to strategic distances, the Soldier functions in the role of a sensor, decision maker, shooter, and assessor.

The individual Soldier is the ultimate sensor. A Soldier observes, listens, feels, and processes information. He analyzes, judges, thinks, prioritizes, decides, and communicates what he knows and does so in real time. The Soldier is a shooter, who designates, directs, or calls for precision engagement. He does this from inches to the limit of his technology-enhanced line-of-sight, in all weather conditions and terrain sets. Most importantly, he is disciplined and trained, understands purpose and intent, and can assess, first hand, the battle damage and the effects of precision engagement. In effect, the Soldier on the ground is the ultimate precision weapon.

On the asymmetrical, chaotic and nonlinear battlefield, the Soldier on the ground operates, and will continue to operate, as an indispensable part of the joint team. Today, operations in Afghanistan and Iraq reaffirm the Soldier's role as the centerpiece of our combat systems and formations. Soldiers enable persistent surveillance, reconnaissance and the right combination of maneuver, fires, and information operations to achieve precision engagement. Soldiers bring the essential human dimension to warfighting dominance. They are the centerpiece of our systems and formations, now and in the future.

With the Soldier as our critical link to success, it is imperative to continuously develop Soldier systems that will enhance the Soldier's combat effectiveness. The Army's Soldier modernization program is a critical component to transforming today's Soldier into the Soldier envisioned in the Future Force.

Soldier Modernization

Soldier modernization encompasses the integration of Soldier systems and equipment

that consist of everything that is worn, carried, or consumed for individual use in a tactical environment.

Soldier modernization uses the "Soldier as a System" concept. In this concept, the Soldier, analogous to a combat platform, has numerous component parts that must work in concert for full effectiveness. Yet, modernizing the Soldier is uniquely different from modernizing all other major weapon system platforms in two significant respects. First, the Soldier system frame is human; its loss is not measurable in dollars. Second, the Soldier is the common element for all Army major weapon system platforms and the operation of every system is affected by the quality of the Soldier and the synergy created by his ability to interface effectively and efficiently with the equipment and systems.

The Land Warrior is a principal program under the "Soldier as a System" concept that includes: a modular fighting system for Soldiers that integrates many components and technologies into a lethal, survivable, mobile, and situationally aware Soldier system. The Army has successfully demonstrated the value of the Land Warrior system and is examining ways to accelerate its production and fielding.

The Soldier modernization process is accomplished through the use of one of three Soldier system development paths: the Soldier Enhancement Program (SEP), the Clothing and Individual Equipment (CIE) program, and the Warrior Programs (represented by Land Warrior, Mounted Warrior, and Air Warrior). Also in development are the Combat Support (CS) and Combat Service Support (CSS) Soldier. The SEP requires minimal Research, Development, Test, and Evaluation (RDT&E) effort and shortens the developmental phase of the life-cycle process through the use of commercial off-the-shelf (COTS) items with a goal of three years to field to Soldiers. The CIE program encompasses all combat, life support, ballistic, and environmental protection items worn or carried by the Soldiers for individual use that are not addressed by the SEP or Warrior programs. Central Funding and Fielding (CFF) is the procurement mechanism that acquires and fields SEP and CIE program life-support and mission enhancing equipment for individual Soldiers.

Rapid Fielding Initiative (RFI). In an effort to accelerate Soldier system fielding to operational forces, the Army is utilizing the Rapid Fielding Initiative (RFI) that leverages COTS technology and current SEP/CIE programs. RFI focuses on enhancing several areas of Soldier equipment: Lethality (includes enhanced optics, weapons rails, target locators and communications); Force Protection/ Mobility (includes; Advanced Combat Helmet, Knee and Elbow pads, MOUT kit); and Soldier Mission Essential Equipment (includes enhanced clothing items, hydration system and individual combat shelter).

Rapid Equipping Force (REF). In addition to RFI, there are many other activities that provide equipment items to our operational forces. One such activity that is being institutionalized within the Army is the Rapid Equipping Force (REF). The REF provides a critical link between operational commanders and the PM shops, laboratories, national labs, and defense industry to find the best near-term solutions to equip commanders with their operational needs. This VCSA initiative, originally RIRS (Rapid Integration of Robot Systems), began as an effort to quickly find an operational solution that leverages technology to supplement or replace the age-old use of a grapnel hook and rope to conduct searches in caves, holes, buildings and other hideouts. The iRobot, a small robot developed by DARPA for ordnance disposal and search and rescue

Area	Where We Were a Year Ago…	Where We Are Today!
Soldier Body Armor	Est 12% OIF Soldiers equipped	On-hand in OIF – Enough body armor to equip all Army Soldiers
Armored HMMWVs	500 OEF/OIF HMMWVs	More than 1,900 OEF/OIF HMMWVs
State-of-the-Art Soldier Equipment "RFI"	2% OEF/OIF Soldiers equipped	100% OIF 2 ESBs – Feb 04 50% OIF 2 Soldiers – Jun 04
Armoring Light-skinned Vehicles	Contingency missions only	Executing plan to armor more than 10,000 OEF/OIF vehicles
Stryker/Bradley Add-on Armor	Bradley plan only	100% Stryker Armor 75% Bradley OIF 1 complete
Aircraft Survivability Equipment (ASE)	All OEF/OIF rotary wing aircraft equipped	Upgrading ASE on OEF/OIF rotary wing & equipping select fixed wing
Rapid Aerostat Initial Deployment (RAID)	3 systems in OEF	4 systems in OEF/OIF w/contract for 17 additional systems
Counter IED Device	None fielded	Capability in theater
Tactical & Small Unmanned Aerial Vehicle Systems (UAVS)	No systems in OEF/OIF	9 systems in OEF/OIF Objective: 194

Figure D-5. Protecting Army Forces

operations was the immediate solution. Modified to be a man-portable "PackBot", OEF Soldiers were quickly equipped and trained to use this solution. Another off-the-shelf solution was the "Well-Cam", a web-camera attached to an Ethernet cable and a laptop to allow OEF Soldiers to search wells for weapon caches. Since its initiation, the small REF coordination staff has fulfilled over 50 operational requirements that provide immediate solutions to our operational forces in OEF and OIF. The REF is not a replacement of the existing acquisition and fielding processes, it as an alternative means to rapidly equip Soldiers and insert into our Current Forces the latest technologies and capabilities that become available through our spiral development efforts. The CSA has recently expanded upon the REF mission to include determining what Future Force capabilities under development can be inserted now, rather than later and to assess the technologies already in the Current Force and those inserted to inform the next acquisition spiral development plan.

Force Protection. The REF and RFI, as well as other efforts that accelerate equipment to operational forces, are critical to enhancing our Soldiers' combat effectiveness and protection. In Iraq, the widespread use of Improvised Explosive Devices (IEDs) by enemy forces has created the need to immediately provide additional force protection capabilities that include Add-on Armor kits for tactical wheeled vehicles such as the HMMWV, HEMTT, PLS and FMTVs. Crew Protection Kits, which are integrated into the vehicle design, like the Up Armored HMMWV, currently offer the best solution. The Army is pursuing the procurement and fielding of kits that provide steel doors with windows, back plate and steel plates for lower perimeter of the vehicle and ballistic windshields that provided the highest level of protection while maintaining equipment

payload requirements for these vehicles. The add-on Armor kit is currently funded for 8400 HMMWVs, 453 HEMTTs, 306 FMTVs, 594 PLS and 71 HET kits in FY04-05. The Army continues to pursue add-on armor kits for all families of tactical wheeled vehicles.

EOD Family of Systems. Another area of emphasis to enhance Soldier protection is the family of systems available to Soldiers in the Army's Explosive Ordnance Detachment (EOD) units. These systems are critical to homeland security, force protection and support of the global war on terrorism. They provide EOD soldiers at home and abroad with the capability to effectively and safely examine, identify, and render safe ordnance. Lessons Learned from OEF and OIF have increased the awareness and priority of EOD systems. Future acquisitions will include: the Non-invasive Filler Identification (NFI) system, the Man Transportable Robotic System (MTRS), and the Large Improvised Explosive Device (IED) Countermeasures family of systems. Each acquisition will be a modified commercial buy. NFI and Large IED Countermeasures are new critical capabilities; MTRS will provide an improved capability. These systems are described in this annex at Appendix 2, Protection, under "Discussion of Key CBRNE Defense Materiel Programs."

Combat Identification (CID). CID measures are another means to enhance Soldier protection. As a result of past CID efforts and lessons learned during Operation Desert Storm (ODS), significant efforts have been made to reduce fratricide with improved CID measures. In OEF and OIF, the widespread use of GPS systems and Blue Force Tracking (BFT) systems such as FBCB2 have proven to significantly reduce fratricide incidents through an improved capability in locating and identifying friendly forces on the battlefield. These systems and other CID measures are critical today in the fast-paced, nonlinear, distributed, simultaneous, offensive-oriented battlefield environment.

In FY02, due to technical challenges, the Army terminated the Battlefield Combat Identification System (BCIS) designed to improve Current Force CID capabilities. The millimeter wave technology being developed under this program was transferred to Future Force development efforts. In an effort to reinitiate a CID program, the G-3/G-8 have established a CID Overarching Integrated Process Team (OIPT) to update the strategy and concept for proceeding forward with a DOTMLPF integrated CID program that leverages advanced technology. This OIPT will provide an updated and approved CID concept and strategy; a CID Action Plan for the Current and Future Forces in a joint, interagency, multinational (JIM) environment, and a funding strategy to support a CID program in the FY06-11 FYDP. An Analysis of Alternatives (AOA) will be used to develop investment strategies properly focused on mission, task, and purpose to meet joint warfighter requirements. Additionally, the Army Science Board will conduct an ad hoc study to assist the Army staff in their review and synchronization of CID efforts. A Coalition Combat Identification Advanced Concept

Technology Demonstration (ACTD) is scheduled for FY04-05 to demonstrate all technology capabilities in a networked system of systems framework. This ACTD will inform the most effective DOTMLPF solutions that merit affordable investment profiles.

The Army's RFI, REF, EOD, CID, and a host of other equipping efforts are challenging existing assumptions and processes to demonstrate a commitment to equipping Soldiers with the best equipment available and providing relevant and ready forces to the Combatant Commanders. We are an Army at war and will meet the current demands while always changing to meet future challenges.

Discussion of Key Soldier Modernization Programs

Land Warrior (LW)

Description. LW is a first-generation, modular, integrated fighting system for ground combatant Soldiers that integrates many components and technologies into a lethal, survivable, mobile, and more situationally aware Soldier system. LW systems/components include a modular weapon system with thermal weapon sight, multifunctional laser with digital compass, video camera, and close combat optic; integrated headgear with helmet-mounted display and image intensifier; enhancements to protective clothing and individual equipment; and integrated individual Soldier computer/radio/GPS. The systems approach optimizes and integrates these capabilities, to include interface with the Army Tactical Internet, without adding to the Soldier's combat load or logistical footprint. S&T advanced technology components in areas such as enhanced navigation, system voice control, weight reduction, digital connectivity, and power will be inserted over time as the technology matures to meet LW objective requirements.

Program Status. In Feb 03, the Army terminated developmental testing and cancelled operational testing and production of the LW Initial Capability (Block 1) system as a result of poor demonstrated reliability. The Other Transactions Agreement (OTA) contract effort ended shortly thereafter, and General Dynamics Decision Systems was awarded the contract for LW-Stryker Interoperable (Block 2) SDD. A restructured LW program provides additional time and resources for risk reduction and spiral development activities. Throughout LW development, the Army will seek opportunities to field mature capabilities to the force early before the fully integrated LW system is available for fielding.

Mounted Warrior (MW)

Description. The MW Soldier Systems (MWSS) encompasses all CIE required for use by combat vehicle crewmen (CVC) in eight functional areas: armor, artillery, air defense, mounted infantry, chemical, military police, ordnance, and combat medics. The MWSS ensemble includes the CVC helmet, flame-protective uniform, cordless communications, heads-up display (for vehicle commanders), and eye protection.

Program Status. The Army Requirements Oversight Committee (AROC) has recommended approval of the ORD. The FUE is required in FY07.

Air Warrior (AW)

Description. AW is a Soldier system for helicopter crewmen that provides a new generation of integrated, mission-tailorable, combat-effective life support equipment and chemical/biological protection with reduced weight/bulk designed to improve aircrew endurance, mobility and performance. AW significantly improves flight time in MOPP 4 gear from 1.6 hours to 5.3 hours. AW systems/ components include:

- Microclimate Cooling System (MCS) that includes a Microclimate Cooling Garment (MCG) and a small Microclimate Cooling Unit that chills water and pumps it through small tubes embedded in the MCG
- Survival Equipment Subsystem that includes a survival gear carrier, soft and hard body armor, PRC90/PRC112 radios, M9 9mm defensive weapon in thigh holster and survival knife in ankle sheath
- Interim Modular Integrated Helmet Display System (MIHDS) with laser eye protection and a night vision device mount
- Over Water Survival Subsystem that includes a personal flotation device, Survival Egress Air (breathing oxygen), and an inflatable raft (LRU-18U) that is integrated into the ensemble and worn by the crewmember
- Nuclear, biological and chemical (NBC) protection with a Modified Chemical Protective Undergarment, M45 or M48 protective mask with blower unit, gloves, and overboots
- Aviation clothing items that include modified Aircrew BDU and the Aircrew Cold Weather Garment System

Future AW system spiral development improvements focus on the technology insertion of improved and/or enhanced components reflecting emerging technologies defined in AW Blocks 2 and 3.

Block 2 developmental efforts are underway and will add an Aircraft Wireless Intercom System (AWIS) and the Electronic Data Manager (EDM). The AWIS will enhance crewmember performance by providing the capability for wireless communications within the aircrew and with ground crew or ramp support personnel such as in a tactical Forward Area Rearm and Refueling Point (FARRP). The EDM, in the form of a digital kneeboard, will provide a capability to the aircrew to generate, store, display, and distribute digital information and will interface with BFT systems.

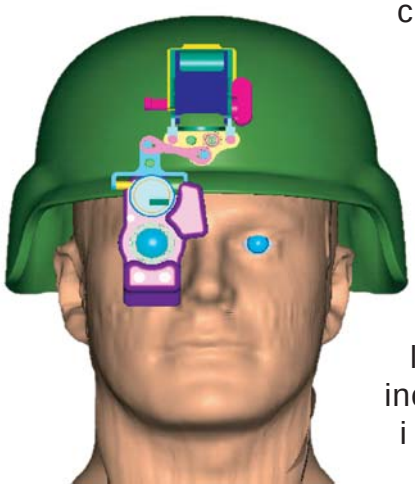
Block 3 efforts will increase performance and capabilities by adding a fully compliant MIHDS helmet. The MIHDS helmet will provide, as a baseline, the same safety performance characteristics as the HGU-56/P helmet (impact, sound attenuation, retention, etc.). The MIHDS will be tailorable and compatible with the Apache helmet-mounted displays and head tracking technologies and will also provide an improved day/night helmet mounted display symbology for those aircraft that currently lack this feature. These helmet-mounted displays will be compatible with aircrew prescription spectacles, chemical/biological (CB) protection, oxygen masks and laser eye protective technologies. CB protection will be donned in flight without removing the helmet. MIHDS will provide the user complete laser eye

protection in the visible through the near infrared portion (400 nanometer-1400 nanometer) of the spectrum and will also provide nuclear flash protection.

Program Status. AW Block 1 production began in FY03 and fielding began in 2QFY04 to the 160th SOAR(A). Block 2 development began in FY02, and Block 3 began in FY04.

Enhanced Night Vision Goggles (ENVG)

Description. The next generation of night vision goggles for the Soldier is the ENVG. It combines both an uncooled thermal and an image-intensification (I2) capability into a single device. The ENVG provides Soldiers with the ability to engage and execute close combat in all levels of light, to include the zero-illumination condition found in caves and underground environments, adverse weather conditions and under battlefield obscurant conditions. This is a system component of the Soldier Warrior programs.



Program Status. This program is in Technology Development phase with a Milestone B decision in early FY04. The Milestone C decision is scheduled in late FY05 with production beginning in FY06.

Thermal Weapons Sights (TWS)

Description. TWS is a family of low-cost, lightweight, man-portable infrared imaging devices of high resolution to be used for surveillance and fire control of individual and crew served weapons during both daylight and darkness. TWS operate in adverse weather and dirty battlefield scenarios including light foliage, smoke, dust, and camouflage and will be fielded to Current and Future Forces as a component of the LW program.

Program Status. Medium and heavy TWS were fielded to the Special Operations Forces; 101st Airborne Division; 82nd Airborne Division; 3rd Infantry Division; 1st Armored Division; 1st Cavalry Division; 4th Infantry Division; 81st, 39th, and 30th enhanced Separate Brigades; 3rd Brigade, 2nd Infantry Division; 2nd Brigade, 25th Infantry Division; and will field to the 10th Mountain Division in Feb 04, all in support of OEF and OIF and as a significant contribution to Soldier survivability and lethality. Light TWS is being fielded to the Rangers in 2QFY04.

XM29 Rifle, Integrated Airburst Weapon System (formerly the Objective Individual Combat Weapon (OICW))

Description. The XM29 is under consideration to replace selected M16 rifles and M4 carbines. The modular, dual-barrel XM29 will combine the lethality of 25mm High Explosive Air Burst munitions and 5.56mm NATO ammunition with a full-solution fire control to effect decisively violent and suppressive target results and to greatly improve small arms performance. This fire control will incorporate direct view optics, thermal sighting, an electronic compass (bearing, tilt, cant), a laser rangefinder, a fuze setter, a ballistic processor and an internal display. The XM29 will be compatible with the digital battlefield and will provide the lethality upgrade for the LW program. The XM29 development program is a spiral development effort to bring the 5.56mm kinetic energy (KE) module (XM8) online in the near future while efforts continue with the

refinement of the bursting munition module (XM25) and the Target Acquisition/Fire Control module (XM104). The Army is still conducting mission analysis and updating the capabilities documentation for this system.

Program Status. The XM29 is a major system acquisition program (ACAT II) in the SDD phase with a Milestone C decision scheduled in FY08 and FUE in FY10.

XM307 Objective Crew Served Weapon (OCSW)

Description. XM307 is a close-combat support weapon that will enable platforms to quickly react with a high-volume fire against troops in the open and lightly armored vehicles. The XM307 will provide 360-degree engagement out to 800 meters under day/night and adverse weather conditions while stationary and on-the-move at elevations from -20 degrees to +60 degrees. The XM307 fired remotely and by the crew from a protected position will fire high-explosive air burst, armor-piercing, KE, thermobaric and nonlethal ammunition from a common magazine, selectable by the crew. This weapon will have an automatic ammunition loading system with a manual backup to allow ammunition to be fed from the right or left sides of the weapon and provide self- or remote-correction of malfunctions. It will contain a T&E mechanism capable of providing rapid target acquisition.

The XM307 weighs approximately 50.3 lbs and is capable of firing 25mm air-bursting munitions designed to defeat defilade targets out to 1000 meters and suppress area targets out to 2000 meters. It includes a full solution fire control that includes direct view optics, full-solution ballistic calculation; digital rangefinder; CCD video; tracker module; digital compass; and environmental sensors, as well as many other options. It is being considered to replace selected M2 and MK19 Grenade Machine Guns. The Army is still conducting mission analysis and completing capabilities documentation for this system.

Program Status. The XM307 program transitioned from the tech base in FY04. The Milestone C decision is scheduled in FY07.

Nonlethal Capabilities Set (NLCS)

Description. U.S. forces increasingly operate in challenging environments known as military operations other than war. These operations include humanitarian assistance, military support to civil authorities, peacekeeping and peacemaking operations, and noncombatant evacuations. Nonlethal capabilities expand the number of options available to commanders confronting situations in which the use of deadly force is not the preferred response. Nonlethal capabilities provide flexibility by allowing forces to apply measured force with reduced risk of serious noncombatant casualties, but in a manner that provides force protection and effects compliance, ensuring the success of the military mission. The NLCS can be rapidly deployed by military transport or commercial carrier to provide commanders with a variety of options tailored to a specific mission or threat level. The NLCS provides the operational commander the ability to employ levels of force proportional to the threat by selecting items from the following six categories:

- **Counter Personnel Systems** allow the application of force to accomplish tasks with reduced risk of fatalities or serious casualties among noncombatants or, in some instances, among enemy forces. These include the Modular Crowd Control Munition, the M1006 and M1029 40mm nonlethal rounds and the M37 Riot Control Agent Disperser.

- **Counter Material Systems** provide U.S. forces with the capability to deny vehicle access to critical facilities through roadblocks and checkpoints. These would include the Portable Vehicle Arresting Barrier and Caltrops.

- **Protective Equipment** is designed to protect the individual from a wide range of threats (e.g., debris, liquids, hand-thrown objects) that can be used by hostile individuals or groups. Equipment includes the nonballistic face shield, body shield and shin guards.

- **Enhancement Devices** facilitate command, control, and communication capabilities, and provide area and/or point illumination to the operational area. These include the Ground Mounted Bullhorn and High Intensity Light.

- **Training Devices/Allocations** are used to train the force to properly employ the set and maintain proficiency. Included are the Riot Training Suit, instruction manuals and munitions allocations for training purposes.

- **Support Equipment** includes individual and crew served weapon systems and the family of military tactical vehicles. These items are associated with the set, not issued with it. These include the 12-gauge Shotgun, M202 Grenade Launcher and vehicle-mounted smoke dischargers.

Program Status. The NLCS was fielded to units deployed in support of OIF1/OEF and currently to units preparing to deploy for follow-on missions. Plans are in place to field 438 platoon-sized sets during the FY06-11 time frame.

Ground Force Modernization

The main body of the *2004 Army Modernization Plan* provides details on the Army's two primary ground force modernization efforts, the accelerated development and fielding of six SBCTs from 2001-2008 and the development and initial fielding of a UA maneuver brigade equipped with FCS from 2003-2010 to bring Future Force capabilities into the Current Force. The USF process will field these units with capabilities achieved from a complete set of unit equipment. Under the system-of-systems approach, the unit must demonstrate the ability to operate interdependent systems together to achieve an IOC for the unit. In FY03, the first SBCT completed fielding and operational testing to achieve IOC. It has since been deployed in support of OIF.

Stryker Brigade Combat Team (SBCT). The SBCT is inherently a precision unit. The force design of the SBCT provides the Army with dominant maneuver and precision engagement capabilities not found in any other Army brigade. Specifically, the Reconnaissance, Surveillance and Target Acquisition Squadron, equipped with TUAVs and ground-based HUMINT specialists, provides the commander with unequalled situational understanding. The networked command and control architecture, which features FBCB2, allows the commander to provide the same picture to lower echelons and

major combat platforms, such as the Stryker vehicle, thereby establishing a real-time friendly force operational picture for the unit. The SBCT also features organic ground-based sniper teams —the essence of precision strike and a critical combat requirement that has once again been validated during the ongoing global war on terrorism.

The SBCT's Force Application capability is truly global. C-130-transportable, the unit can rapidly deploy to austere environments, thereby overcoming enemy area-denial and anti-access efforts, and can quickly mount offensive operations with minimal reception, staging and integration. Although it excels in the midpoint of the operational spectrum, it can fight effectively as a fully committed unit in major engagement and battles with augmentation (such as attack aviation and/or rocket artillery). With its superior tactical mobility and excellent battlefield situational awareness, the SBCT can also execute difficult security missions such as guard, cover, screen, counterreconnaissance and rear-area combat operations. The superior off-road maneuverability of the Stryker vehicle combined with its dismounted infantry assault capability featuring robust anti-tank weaponry, ensures the SBCT can very effectively engage and destroy enemy armor in close, complex and/or urban terrain.

The Army is exploring alternatives in the upcoming program years that will further enhance the SBCT's ability to track and surveil and ultimately engage and destroy targets. Among the systems being examined are precision mortars, advanced artillery munitions such as Excalibur, and initiatives designed to further enhance the SBCT's situational awareness: Joint Tactical Radio System (JTRS), Warfighter Information Network–Tactical (WIN-T), and the Distributed Common Ground System–Army (DCGS-A).

Future Force Development. The Future Force concept embodies precise and dominant maneuver coupled with precision engagement through a combination of maneuver, fires, and information dominance. As an offensive-oriented force, it conducts operational maneuver from strategic distances executing synchronized, distributed operations as part of a Joint Force to destroy key enemy capabilities in a distributed, nonlinear battlespace. It provides seamless C4 and ISR, FCS, integrated sensors, attack and reconnaissance helicopters, expanded maneuver and fires with standoff, LOS, and NLOS capabilities. These attributes enable the Joint Force to achieve total disintegration, dislocation, and destruction of enemy forces from tactical through operational levels. Direct lethal action will contribute to the following joint efforts:

- Destroy and degrade enemy anti-access systems such as long-range missiles and artillery, unconventional forces, enemy surveillance and targeting capabilities
- Participate in the destruction of enemy precision engagement systems. This represents a key task, given the significant threat that enemy systems represent to Joint Force freedom of action and maneuver
- Seize key terrain and facilities required to support force flow and decisive operations, extension of the area of influence, and isolation of enemy forces
- Degrade key enemy capabilities (C4, ISR, and logistical structures) essential to enemy offensive operations
- Provide essential C4, ISR, and logistical support to the Joint Force

- Support the JFC's information operations to gain momentum superiority

FCS-Equipped Unit of Action (UA) Maneuver Brigade. Although the Army has not finalized a complete Future Force design, it has approved an Organizational and Operational (O&O) Plan for a UA maneuver brigade equipped with FCS.

This UA's organizational design includes UAVS at each echelon to enhance the organization's RSTA capability. This capability is viewed as essential to the success of UA operations to build and maintain situational awareness and understanding before, during and after tactical operations. The Aviation UA will provide aircraft resources, as necessary, to FCS UAs. These will include attack/reconnaissance, utility, cargo and UAVS in support of the brigade's mission.

The NLOS Battalion is the UA's primary provider of destructive, suppressive, protective and special purpose fires that enable the UA to conduct decisive operations. It is envisioned that the NLOS Cannon will provide accurate, reliable, responsive on-demand, 24 hour, all weather, all terrain and close supporting fires with a wide array of precision and nonprecision munitions. The NLOS Launcher System provides a networked system of missile launchers with command and control systems that will provide both precision and loitering attack munitions. NLOS Mortars (organic to the UA combined arms battalion) will also provide supporting fires to the UA. The combination of NLOS mortar, cannon, launcher systems in the UA and HIMARS in the UE will provide the future commander with a greatly increased precision and lethality capability.

Discussion of Key Ground Force Materiel Programs

Abrams Tank

Description. The Abrams Recapitalization program is a modernization program of the current armored force that seeks to ensure it remains relevant to the developing Future Force until fully replaced by the Mounted Gun System (MGS) variant of the FCS by maintaining combat overmatch and reducing O&S costs. The core of this program is embodied in the M1A2 SEP and M1A1 Abrams Integrated Management (AIM) programs. The M1A2 SEP program began in FY99 and selectively upgrades M1 tanks or retrofits M1A2 tanks with rebuilt critical components that bring the tanks to a near zero hours/miles condition. M1A2 SEP tanks have 2nd Generation FLIR (2GF) sensor in the Commander's Independent Thermal Viewer (CITV) to enhance target acquisition and significantly improve lethality; hardware and software that supports Army digitization and the FBCB2 system; digital diagnostics system that enhances tank maintenance and sustainment; thermal management system that reduces the tank's battlefield signature and an improved armor system that improves survivability against emerging threats. A major improvement to be incorporated in all M1A2 SEP tanks is an improved AGT 1500 engine. The Abrams Engine Improvement Program will

provide the tank with better agility and mobility, easier maintenance and reduced O&S costs over the tank's current and aging AGT 1500 engine. The development of the improved AGT 1500 engine will continue through FY05, with procurement beginning in FY05, and will eventually replace all older versions of the AGT 1500 engines, thereby focusing this program on the entire Abrams tank fleet. Other future capabilities intended for the M1A2 SEP include 2GF for the gunner to enhance target acquisition and significantly improve lethality, hardware and software that supports Army FBCB2 digitization, embedded digital diagnostics system that enhances tank maintenance and sustainment, and improved armor that increases survivability against emerging threats.

Since the Army cannot afford to procure M1A2 SEP tanks for every crew, it is also pursuing a recapitalization procurement and modernization strategy that provides M1A1 tanks with rebuilt AGT 1500 engines and improvements to selected tank subsystems that bring the tanks to a near zero hours/miles condition. In addition to being a rebuild program, the M1A1 AIM Program provides selective technology insertions designed to extend the service life of the fleet while reducing O&S costs. Some of these improvements include: Revised Hull and Turret Network Boxes, a Digital Electronics Control Unit, a Driver's Hatch Interlock sensor system, an Upgraded Tank Commander's Panel, an Eye-safe Laser Rangefinder, a Pulse Jet Air System, and a Battlefield Override (mechanical fuel and transmission bypass) system. Incorporation of the improved AGT 1500 engine is planned for in the FY05 time frame.

Program Status. The Army has completed fielding of M1A2 SEP tanks to the 1st Cavalry Division and is scheduled to complete the fielding to the 4th Infantry Division in FY05. Efforts are underway to complete the modernization of III Corps by fielding M1A2 SEP tanks to 3rd Armored Cavalry Regiment once additional funding is secured. Currently, the Army is projected to procure 717 M1A2 SEP tanks.

The Army has completed fielding M1A1 AIMs to the 1st Armored and 1st Infantry Divisions in Europe. The next units to be fielded are the 2nd Infantry Division and brigades of the 1st Armored and 1st Infantry Divisions at Fort Riley and the Army Prepositioned Stock (APS). Currently, the Army is projected to procure a total of 1,065 AIM tanks. Modernization of the Army National Guard continues through cascading of M1A1s from the AC.

Bradley Fighting Vehicle

Description. The Bradley recapitalization program rebuilds and upgrades M2/M3A2s to the most modernized M2/M3A3 configuration. The A3 adds two 2GF devices (one in the Commander's Independent Viewer (CIV) and one in the Improved Bradley Acquisition Sight (IBAS)), a position/navigation (POS/NAV) system, core electronic improvements, and digital C2. These upgrades improve the crew's ability to navigate, pinpoint and identify friendly and enemy positions, and engage nearly simultaneously targets in both day and night conditions. Also, the digital C2 provides a near

real-time integrated data link between the M2A3 and other combat vehicles.

Program Status. The 1st Cavalry Division and 4th Infantry Division will be fielded with 595 recapitalized M2A3 Bradleys. The 3rd ACR will be fielded with 131 recapitalized Bradley Cavalry/Scout vehicles (M3A2 OIF configuration) containing FBCB2, the IBAS, and a ballistic fire control system. Selected III Corps engineer battalions will be fielded with 342 converted M3A2 ODS-D vehicles. These digitized vehicles will vastly improve the lethality, survivability and situational awareness for engineers and supported units. Further digitization to the active fleet will be determined as the Army builds the FY06-11 program plan.

Stryker Family of Armored Vehicles

Description. The Stryker Family of Armored Vehicles is the centerpiece combat and combat support platform for the SBCTs. Two variants of the Stryker will be fielded: the Mobile Gun System (MGS) and the Infantry Carrier Vehicle (ICV). There will be eight additional configurations of the ICV: Reconnaissance Vehicle (RV), Mortar Carrier (MC), Commander Vehicle (CV), Fire Support Vehicle (FSV), Engineer Squad Vehicle (ESV), Medical Evacuation Vehicle (MEV), Antitank Guided Missile Vehicle (ATGM), and Nuclear, Biological and Chemical Reconnaissance Vehicle (NBCRV). Stryker capabilities include:

- Strategically responsive and deployable on the U.S. Air Force (USAF) family of tactical aircraft
- Roll-on/roll-off, combat-capable with minimum preparation
- Superior situational awareness with internetted communications

- Survivability enhanced by all around 14.5mm armor piercing and 152mm artillery airburst protection (add-on armor provides protection against rocket-propelled grenade (RPG) anti-tank weapons)
- Accurate target acquisition with Long Range Advanced Scout Surveillance System (LRAS3) mission package
- Accurate target engagement with Remote Weapon Station (Mk 19 grenade launcher and M2 .50 caliber machine gun)
- Decisive offensive action with dismounted infantry assault (ICV)
- Bunker-busting capability with 105mm cannon (MGS) for roles in immediate fire support of dismounted infantry operations and with the TOW Bunker Buster munitions (ATGM)
- Responsive indirect fires with 120mm dismounted mortar (MC)
- Antitank capability with TOW 2B (ATGM) and Javelin-equipped dismounted infantry (ICV)

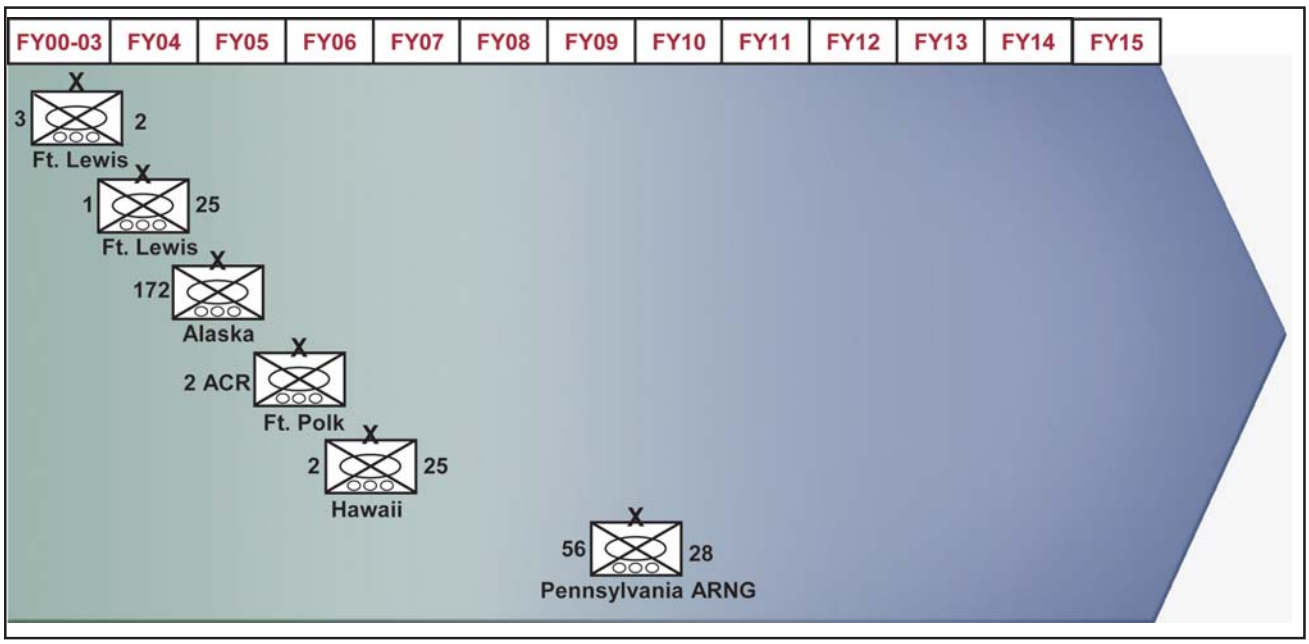


Figure D-6. SBCT Fielding Schedule

- Mobility enhanced by mine plow, roller and detector (ESV)

- Integrated NBC sensor capability (NBCRV)

The Stryker provides a unique family of systems approach that maximizes commonality and integrated capabilities while filling an immediate capabilities gap in the Current Force. Supporting Stryker fielding is a complete new home station equipment training package for both operators and maintainers.

Program Status. Planned procurement is for 2,096 vehicles consisting of two variants: Infantry Carrier Vehicle (ICV) and Mobile Gun System (MGS). The Army has fully funded and the Secretary of Defense has authorized the procurement and fielding of six SBCTs to fulfill the Defense Strategy and national security requirements. Figure D-6 provides the current SBCT fielding schedule.

Lightweight 155 Howitzer (M777)

Description. The Army has a requirement for an advanced, towed lightweight 155mm howitzer, with self-locating and aiming capability, that meets increased operational thresholds for mobility, survivability, deployability and sustainability. The M777A1 lightweight 155mm howitzer is funded in the FY05-09 program plan as a weapon system that meets this requirement. A joint Marine Corps/Army program, the M777 will provide accurate, reliable, responsive, on-demand, 24-hour, all weather, and all terrain close support fires to maneuver forces.

Program Status. In Nov 02, the M777 entered LRIP for 94 USMC, nondigitized howitzers to be delivered in FY03 and FY04. The FY05-09 Army program plan funds the procurement and fielding of the digitized, self-locating, self-aiming/-pointing upgrade of this system (M777A1) to selected Army units, beginning with the SBCTs in FY06-08. USMC howitzers will be retrofitted for the digitized upgrades after fielding to Army units.

Future Combat Systems (FCS)

Description. The FCS is a networked system of systems that will serve as a core building block within modular maneuver echelons of the UA maneuver brigade. The FCS (Figure D-7) will consist of the combination of 18 manned and unmanned air and ground platforms that are networked with each other and other supporting systems.

The FCS will provide lethal direct fire, indirect fire, air defense, complementary nonlethal fires and effects, and troop transport capability. The FCS will provide a secure C4 and ISR system to harness advances in the distribution and effective use of information power that enable it to see first, understand first, act first and finish decisively. The FCS-equipped UA allows Soldiers to operate as a coordinated part of a distributed, networked force, enabling innovative operational behaviors and organizational structures. The FCS will provide overmatching combat power with the lethality, agility, sustainability, and versatility necessary for full-spectrum military operations from small-scale contingencies to stability and support operations to major combat.

The FCS leverages advanced technologies through spiral and incremental development. An open architecture design enhances system versatility via an upgradeable and tailorable engineering approach that supports system of systems engagement for different missions as needed. The program uses high-payoff advanced technologies and techniques in areas such as survivability, lethal and nonlethal effects, supportability, propulsion, mobility, structures, robotics, human factors, training, and modeling and simulation. The combined approach of innovation in operations and acquisition supports the fielding of FCS-equipped combat formations this decade and into the future.

Program Status. In May 03, FCS was approved to move into the SDD phase. Key SDD events in FY04-05 include the System Requirement Review and Design Concept Review in 2QFY04, the Initial Baseline Review II in 3QFY04, the System Functional Review in 4QFY04, Milestone B Update in 1QFY05 and a Preliminary Design Review in 3QFY05. Three critical developmental challenges within the FCS program are: C4 and ISR architecture (the Network); spiral development and field experimentation; and tactics and doctrine

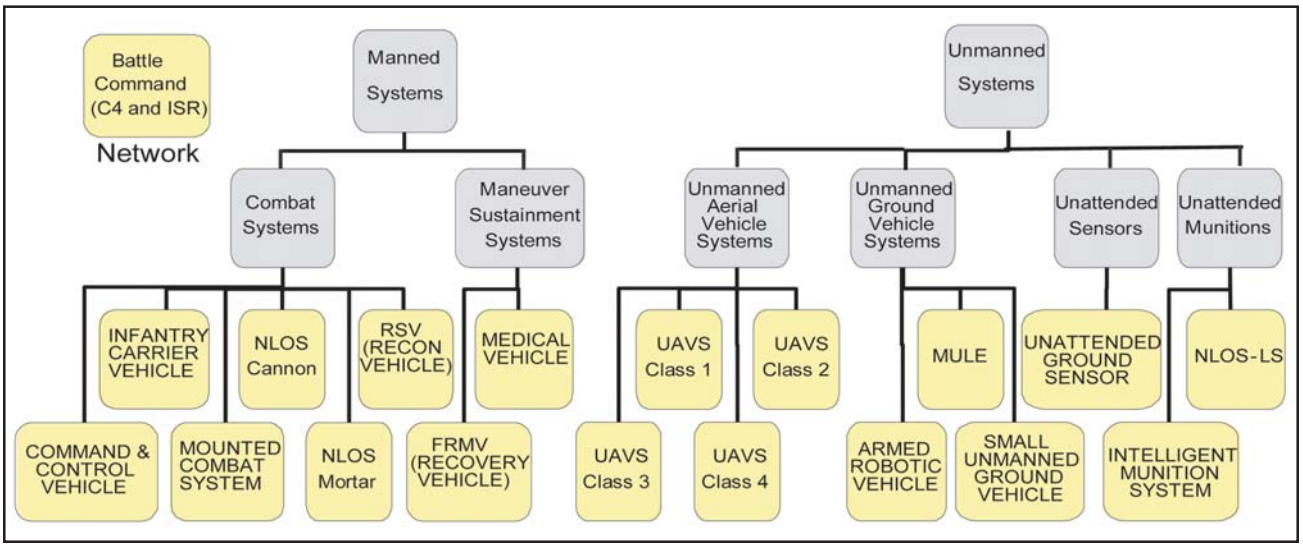


Figure D-7. Future Combat Systems

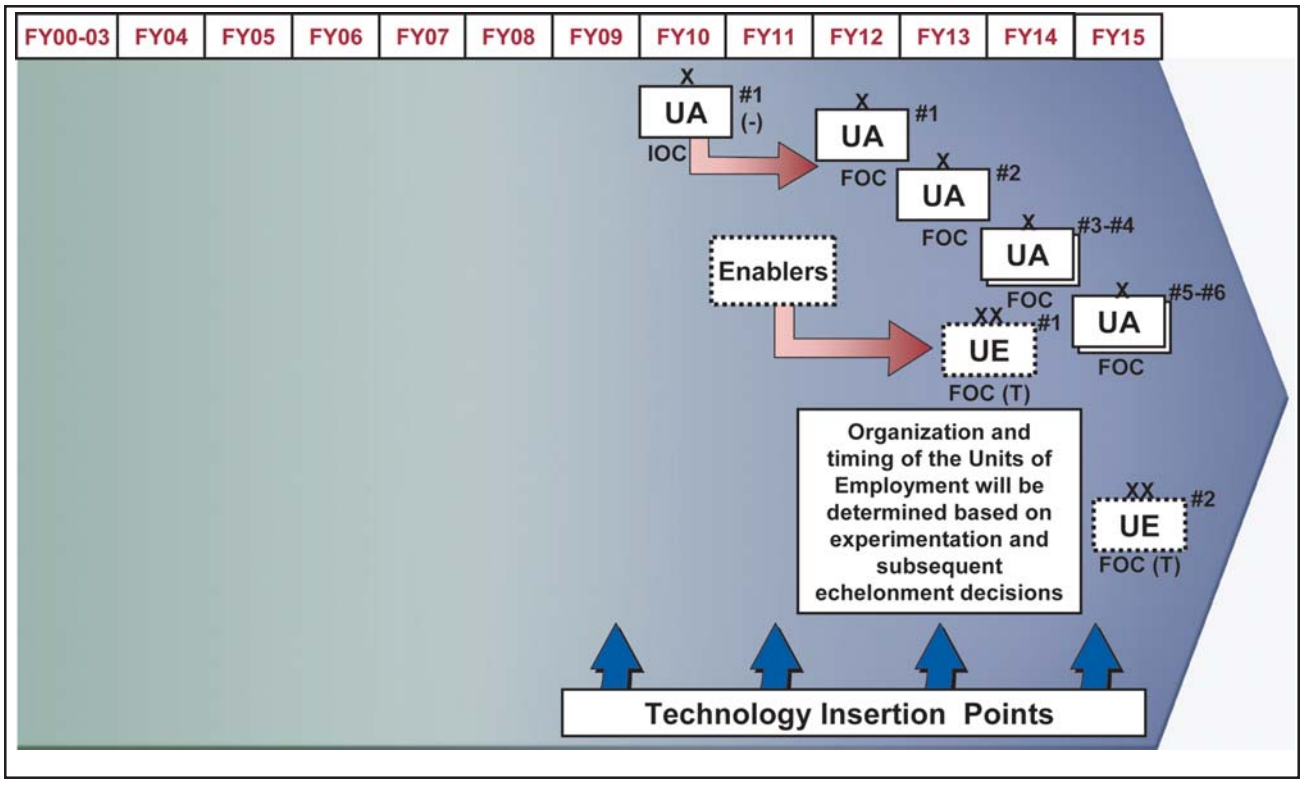


Figure D-8. FCS-Equipped UA Fielding Schedule

development for a complete DOTMLPF solution. An important aspect of FCS development is the desire to take emerging technologies being developed for FCS and insert them into the Current Force. The FCS will be fielded to the first UA to achieve an initial operational capability by 2010. Figure D-8 depicts a projected fielding schedule out to FY15.

Non-Line-of-Sight Cannon (NLOS Cannon)

Description. The NLOS Cannon is currently embedded in the overall FCS program architecture. The NLOS Cannon will provide accurate, reliable, responsive on-demand, 24-hour, all-weather, and all-terrain close supporting fires as an integral part of the Future Force. It will utilize the Modular Artillery Charge System (MACS) and inductively set fuzes, such as the M762/A1, M767/A1 and Multiple Option Fuze, Artillery (MOFA). As the primary fire support asset available to the UA commander, it will provide sustained fires capability for both precision (Excalibur) and area fires (suppression) to forces in combat and be networked to joint fires. Its networked capability and high rate of fire enable it to provide rapid fires at extended ranges. System development will be integrated with the development of a suite of munitions and complementary ISR capabilities that locate, track, identify, engage and destroy all target types with effects scaled by the mission and target set.

Program Status. The Army, in partnership with the Defense Advanced Research Projects Agency (DARPA) has established an aggressive, collaborative demonstration program in support of the FCS initiative. This demonstration included both live-fire and mobility phases. An FCS Program Manager has been assigned to DARPA and the overall management authority for the FCS program resides with the Program Executive Officer

(PEO) for Ground Combat Systems. NLOS-Cannon transitions to SDD as a component of FCS.

Non-Line-of-Sight Launcher System (NLOS-LS)

Description. The NLOS-LS is currently part the overall FCS program architecture. The NLOS-LS is a networked system of missile launchers with an integrated command and control system that will provide precision and loitering attack munitions. It will provide accurate, reliable, responsive on-demand, 24-hour, all-weather, and all-terrain fires as an integral part of the Future Force. NLOS-LS will provide networked, extended-range targeting and precision attack of armored, lightly armored and other stationary and moving targets during day, night, obscured and adverse weather conditions. The system's primary purpose is to provide responsive precision attack of High-Payoff Targets (HPT) in support of the UA in concert with other UA NLOS systems as well as other Army, joint, interagency and multinational system capabilities. Future technology improvements will allow the system to provide discriminating capability via automatic target recognition (ATR) and contribute to battle damage assessment (BDA). The system has flexibility to respond to all UA sensors, SOF, other UE joint and multinational elements. The NLOS-LS will be a self-contained system with multifunctional munitions (NLOS, ground-to-air, counter-mobility) capability. The system will be capable of multi-modal transport and be fired from the ground or from manned/unmanned tactical transport vehicles. NLOS-LS consists of the container launch unit (CLU) with individual containerized munitions and an onboard command and control capability. Operational requirements may necessitate the development of additional munitions variants such as thermobaric and nonlethal applications. Variants should be the smallest number that satisfies all requirements. The system has an external mission planning software application designed to operate on the future battle command system for planning and execution of multiple and simultaneous missions including engagement with different munitions.

Program Status. The Army, in partnership with the DARPA is involved in an aggressive, collaborative demonstration program in support of the NLOS-LS initiative that will transition to an Army SDD effort in FY04. An NLOS-LS Task Force was formed under PEO Tactical Missiles to facilitate the transition and coordinate actions to ensure initiation of NLOS-LS Block I SDD.

High Mobility Artillery Rocket System (HIMARS)

Description. HIMARS provides early entry Current and Future Forces with continuous all-weather precision medium- to long-range rocket and missile fires to a depth of 300km. HIMARS also provides fires in conduct of TAMD IAW Joint and Army doctrine. Mounted on an FMTV chassis, HIMARS is C-130-transportable combat loaded, and provides full MLRS family of munitions (including GMLRS and ATACMS) capability, yet requires 70

percent fewer airlift resources to transport a battery than the current M270 MLRS launchers. HIMARS ACTD prototype launchers were successfully employed in OIF providing precision fires in support of SOCOM and Army operations.

Program Status. HIMARS is in LRIP with FUE programmed for 2QFY05 to the XVIII Airborne Corps.

Discussion of Key Ground Force Munitions Programs

Army Tactical Missile System (ATACMS) Family of Munitions

Description. The ATACMS Family of Munitions (FOM) provides the Joint Force Commander with a surface-to-surface, all-weather, responsive, deep strike weapons capability for the attack of area and point targets from ranges of 25-300km. ATACMS has been produced since 1990 in a logical series of improvements to range, accuracy, and lethality. Missile production is continuous with each new block improvement, when ready, cut into the existing production line. ATACMS Block I proved its effectiveness during Operation Desert Storm; a significant number of Block I, IA and QR Unitary were successfully employed in OIF in support of USAF, USMC, SOCOM and Army operations. The entire ATACMS FOM is launched from improved MLRS M270A1 and HIMARS rocket and missile launchers.

Program Status. The FY05-09 program plan limits Block II/BAT procurement to an LRIP level of 96 missiles, funds procurement of ATACMS Unitary missiles and initiates a Service Life Extension Program (SLEP) for Block I and IA missiles that are approaching the end of their shelf life. An ATACMS Penetrator (ATACMS-P) variant is being developed and demonstrated as part of a cooperative Army/Navy ACTD that will be completed in FY04 with three test firings and delivery of six residual missiles to U. S. Forces Korea (USFK). The future role of the ATACMS-P program in support of the OSD-lead Hard and Deeply Buried Target initiative is unresolved.

Chemical Energy Missiles—Javelin and TOW 2B.

Description. The **Javelin** missile provides dismounted infantry with a medium-range, man-portable, shoulder-launched, fire-and-forget, anti-armor weapon system that provides a highly formidable capability able to defeat all known armor threats for the dismounted close fight. As a fire-and-forget missile with top and direct attack modes and 2.5 times the range, Javelin is a leap-ahead improvement over the Dragon system. Moreover, the Javelin's Command Launch Unit incorporates an integrated day/night sight and greatly improves battlefield surveillance and survivability. Javelin has fire-and-forget technology that allows the gunner to lock on to the target, fire the missile, and immediately take cover. Other features include a tandem warhead, an imaging infrared seeker and a soft launch that allows the missile to be fired from enclosures. In addition to its high lethality, Javelin is ideally suited to rapid deployment due to its size, its high reliability, and its very small logistics tail. The Javelin has won high praise from commanders engaged in combat operations during OEF and OIF. For example, during the Apr 03 battle of Debecka Pass in Northern Iraq, the Javelin missile

played a decisive role in enabling a Special Forces unit to destroy an attacking armor formation. Lessons learned from these operations are shaping the Javelin P3I program.

Program Status. Javelin FUE was Jun 96 with full rate production beginning in May 97 scheduled to continue through FY05. Javelin is currently being fielded to Infantry, Armor Scouts, and Combat Engineer units. The Block I program includes improvements in the Command Launch Unit for better target detection, recognition and identification, and extended surveillance time; the missile includes improved performance at maximum range, reduced flight time, reduced acquisition time and Counter Active Protective System interface. The Javelin weapon system is part of the FCS, dismounted with the Infantry Carrier Vehicle (ICV) and integrated with the Armored Robotic Vehicle-Assault Light (ARV-A (L)) MULE, and provides risk mitigation paths for the ARV-A (6-ton vehicle). The Dec 03 AROC approved Stryker ORD identified the requirement to integrate the capability to fire the Javelin from the Infantry Carrier Vehicle (ICV) as a future Block improvement.

Description. The **TOW Weapon System** is a crew-portable, vehicle-mounted, heavy anti-armor weapon system designed to defeat armored vehicles and other targets such as field fortifications. The TOW weapon system provides the heavy anti-armor/assault capability for the Army's Infantry forces (Airborne, Air Assault, Light, SBCT, and Bradley-equipped Mechanized) and the USMC forces with the TOW equipped HMMWV, LAV, and Cobra helicopters. The TOW family of missiles provides a man-in-the-loop precision point targeting capability, which serves to minimize collateral damage—a preeminent consideration in current and emerging operating environments. During OIF, the TOW missile fired from the Improved Target Acquisition System (with 2GF), won accolades from the 101st Airborne Division (Air Assault) for the decisive role these systems played in enabling the division to employ precision fires to destroy enemy forces while also avoiding collateral damage. The modernized TOW 2B (Aero) missile will provide even greater range and countermeasure defeat to TOW-equipped units and will mitigate TOW inventory risk. The TOW Bunker Buster missile (TOW BB) was fielded to the first SBCT in Nov 03 as an in-lieu-of mitigation item for the Stryker ATGM until the Stryker MGS is fielded.

Program Status. Procurement of 2,861 TOW 2B missiles from the projected requirement of 12,332 missiles is funded in the FY05-09 program plan. The Army will consider additional procurement in the FY06-11 program plan build to maintain the minimum production line sustainment rate.

Guided Multiple Launch Rocket System (GMLRS) Rocket

Description. The MLRS M26 basic rocket is nearing the end of its shelf life and is now out-ranged by many enemy artillery systems. GMLRS is a major upgrade to the M26-series rocket that integrates a Guidance and Control package and a new rocket motor to achieve

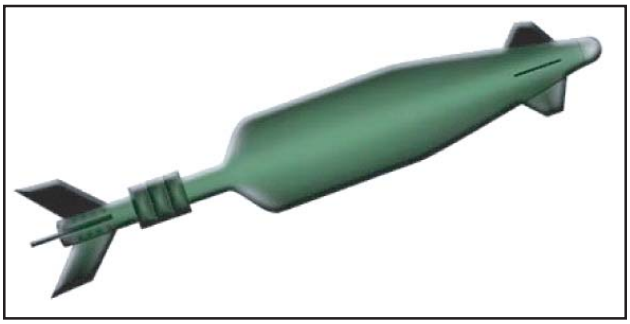
greater range and precision accuracy. GMLRS rockets are precision-guided munitions (GPS-aided inertial measurement unit (IMU)) that enable a force commander to engage and destroy the enemy at ranges out to and beyond 60 km, with precision, and with fewer rockets. The threats to be engaged include self-propelled and towed artillery; multiple rocket launchers; forward-positioned, surface-to-surface missiles; a wide variety of active and passive, soft or lightly armored vehicles; area or point targets with no collateral damage constraints, or critical point hard/soft targets requiring low-collateral damage. In addition, GLMRS provides the capability to neutralize or destroy enemy air defense at tactical depths.

Launched from an M270A1 MLRS tracked or HIMARS wheeled launcher, the GMLRS rocket contributes to the Current and Future Forces by providing the warfighter with increased operational capability through advanced technology while reducing the logistical resupply burden associated with unguided area munitions. The dual-purpose improved conventional munitions (DPICM) version of the GMLRS contains 404 submunitions (M77 grenades) to attack area targets. Fuze improvements, combined with the improved accuracy, will also greatly reduce the hazard to operational maneuver and collateral damage from unexploded ordnance. The GMLRS Unitary rocket will be an improved version of the GMLRS DPICM rocket. The primary difference is the replacement of the DPICM submunitions payload with a unitary warhead that will have a multi-mode (point detonating, delay and proximity) fuze capability. The GMLRS Unitary rocket will provide the ability to attack critical area and point targets beyond cannon artillery ranges or targets in restricted terrain (under foliage, urban environments, and heavy snow) that may require reduced collateral effects.

Program Status. GMLRS development was an international program with the United Kingdom, Germany, France and Italy, with an RDTE 50/50 cost-share agreement between U.S. and European partners. The United States managed the prime contract. GMLRS DPICM began LRIP in FY03 and will achieve IOC by FY06. GMLRS Unitary is currently a U.S.-only effort in SDD. The GMLRS Unitary rocket will be developed and fielded using an evolutionary acquisition strategy and spiral development process. The evolutionary strategy approach will deliver a capability to the Soldier in increments, recognizing up front the need for or opportunity to integrate technologies to support future capability improvements.

120mm XM395 Precision Guided Mortar Munition (PGMM)

Description. PGMM is a 120mm laser-guided precision mortar munition, designed to defeat high-payoff targets with low collateral damage. It is the maneuver task force commander's "hip pocket" indirect precision effect, capable of providing responsive, standoff defeat of high-value targets. Current military operations have underscored the immediate and significant need for an organic, responsive, indirect fire, extended range, precision strike munition that



has significant capability against a variety of protected targets. Targets are threat infantry protected by field fortifications, masonry walls, or lightly armored vehicles. 120mm mortars are key, organic lethality platforms for the Current and Future Forces. PGMM is the key lethality system for the close fight.

Program Status. PGMM transitioned into the SDD phase in 1QFY04 with production scheduled to begin in FY08 and fielding in FY10.

Excalibur

Description. Excalibur is a cannon-delivered precision-engagement, extended-range family of 155mm artillery projectiles that self-guide to a programmed aim point using the GPS. Munitions to be developed are Unitary, Smart and Discriminating. Excalibur will deliver 10-20 meter Circular Error Probable accuracy from minimum (8km) to maximum (30-40km) ranges in all weather conditions. Anti-jam technology and an Inertial Navigation System are used to provide precision-strike capability in a GPS jamming environment. Target and fuze data are programmed into the projectile via an inductive projectile programmer, Enhanced Portable Inductive Artillery Fuze Setter (EPIAFS). Excalibur uses an optimized (near-vertical) terminal trajectory to engage targets in urban and complex terrains with minimal collateral damage. Excalibur will overcome the limitations of current area engagement munitions with precision, increased range, lethality, and minimal collateral damage.

Program Status. Excalibur is in SDD and is a Cooperative International Development program with Sweden. The first spiral of Increment I will provide an initial capability to the JLW 155 Howitzers (M777E1) for the Stryker Brigades in FY06. The second spiral of Increment I will provide an IOC to the M777E1 and NLOS-Cannon in FY08. Future Unitary variant spirals will reduce costs, refresh technology and enhance performance capabilities to reflect evolving requirements. Similar strategies and processes will be used for Excalibur Smart and Discriminating variants.

Kinetic Energy Missiles—LOSAT and CKEM

Description. The Army is currently developing two kinetic energy missiles: Line-of-Sight Anti-Tank (LOSAT) and the Compact Kinetic Energy Missile (CKEM). LOSAT represents the first generation of kinetic energy missiles. LOSAT provides light ,early-entry forces extended range overmatch against armor and other hardened targets to greatly increase the lethality of these forces. CKEM will also provide this capability, but at approximately half the size and weight of the LOSAT missile. CKEM capabilities will include auto tracking

of targets, overmatch lethality against projected threat systems to include those using explosive reactive armor active protection systems, and a system ability to engage three targets within ten seconds. The system launcher will slew to target, track the missile, target during missile flight and provide missile command guidance updates to the missile.

Program Status. LOSAT is scheduled to achieve IOC in FY08. The FY05-09 program plan funds development and procurement of one LOSAT battalion for the XVIII Airborne Corps Division Ready Force (DRF). CKEM is in the S&T phase of development with technology readiness levels projected to support starting the SDD phase in FY06.

Mid-Range Munition (MRM)

Description. MRM is an autonomous and laser-guided smart munition concept fired from an FCS Mounted Combat System Increment I vehicle. This munition extends the maneuver commander's battlespace beyond LOS to more than 12 km. MRM exploits the ability of the FCS-equipped UA to identify targets at greatly extended ranges, as well as pass digitized targeting information, in real-time, to the maneuver commander or shooter. It also exploits autonomous Semi-Active Laser (SAL) and smart munitions technologies to provide a munition capable of being fired from a platform at extended range beyond-line-of-sight targets. There are currently two MRM round concepts being pursued, MRM-KE and MRM-CE.

MRM-KE is an advanced guided, boosted, kinetic energy (KE) anti-armor smart munition capable of defeating current and advanced armored threat vehicles from close in to extended BLOS ranges. It utilizes a KE rod and rocket motor technology to thrust the round towards the target at very high speed for defeat. A millimeter wave (MMW) autonomous seeker, or SAL, along with radial maneuver thrusters are used to acquire and guide the round towards the target with high accuracy. The projectile uses fins to aerodynamically induce spin and accelerometers to provide body motion data to ensure proper dynamics for seeker search area processing.

MRM-CE is an advanced, guided, chemical energy (CE) anti-armor smart munition capable of defeating current and advanced armored threat vehicles from fairly close in to extended BLOS ranges. It utilizes a dual tandem, CE, shaped-charge warhead at relatively slow round impact speeds for target defeat. A dual-mode MMW, Imaging Infrared (IIR) autonomous seeker or SAL is used to acquire and guide towards the target with high accuracy. The sensors are mounted on a unique ball-joint gimbal to accomplish sensor imaging and large sensor search areas for target acquisition. The projectile uses canards and fins to stabilize the round and IMU technology to allow it to glide accurately towards the target during seeker search and terminal impact.

Program Status. The MRM program is currently completing the Advanced Technology Demonstration (ATD) phase. A Milestone B decision is schedule for 4QFY04. SDD phase will start in FY05 with a Milestone C decision scheduled for FY09 and FRP in FY10.

Force Application Capabilities Summary

Stryker, FCS, HIMARS, and the other materiel programs described in this appendix readily demonstrate the Army's modernization efforts to develop network-centric forces enabled by superior situational understanding and decision-making speed, capable of dominant maneuver and precision engagement (Force Application) as part of the joint team.

As the Army transforms to a Future Force design and capability, it will explore new and promising technologies that will provide enhanced Force Application capabilities. Inherent in this design is the requirement for all means of precision engagement to operate within a joint and combined system of systems and to be strategically responsive so that it remains an effective partner in the joint fight. This means that the Army must maximize commonality of organizations and equipment as well as fully leverage information technologies. Army Transformation will meet these key requirements.

Appendix 2: Protection

Protection is the sum of all actions taken to prevent an adversary's effect on the Joint Force and the population that the Joint Force protects. These actions include protection of personnel, infrastructure and critical computer networks. Because WMD pose a unique and catastrophic threat to personnel and infrastructure, special measures taken to deter and mitigate the effectiveness of an adversary's use of WMD. These measures include WMD counterproliferation, nonproliferation and our ability to conduct effective consequence management following an attack using WMD.

Protection is accomplished through the planned and integrated application of several security-related and supporting operations and programs including law enforcement, physical security, protective services operations, critical infrastructure protection, information operations, crisis response, consequence management, intelligence and counterintelligence, intelligence fusion, counter terrorism and antiterrorism, and through Air and Missile Defense (AMD) and Chemical, Biological, Radiological, Nuclear, and High Yield Explosive (CBRNE) defense measures.

The Army provides full dimensional protection against enemy effects at the strategic, operational, and tactical levels to the homeland, our allies and coalition partners, and the Joint Force. The protection of national or host nation assets and national centers of gravity is vital to the strategic level of operations from which national or combat power is generated.

The Army's priority of efforts in force protection remain focused on supporting operational forces and equipment deployed and in-transit; capitalizing on threat reporting and coordination with international/national intelligence and law enforcement agencies; enhancing detection and deterrence capabilities for CBRNE threats; institutionalizing installation access control for personnel and vehicles; improving policy and doctrine; strengthening training and exercises; and expanding force protection assessments.

Physical security programs continue to focus on ensuring the adequacy of policy and programs, physical security technology initiatives, access control and civilian police and guard initiatives necessary to ensure the security of individuals and property in support of worldwide Army operations. The Army is continuing to assess our critical infrastructure to ensure adequate protection against potential threat actions.

This appendix provides a brief discussion of Army Protection capabilities, specifically, Army AMD and CBRNE defense capabilities and key materiel programs associated with these capabilities. The importance of space-based capabilities and their role in force protection is also described.

Army Air and Missile Defense (AMD) Capabilities

A robust AMD program is a vital warfighting requirement that protects our homeland, deployed forces, friends and allies. This is achieved through an integrated system set consisting of satellite sensors, early-warning radars, command and control centers, fire control systems, and missiles and warheads. Missile defense efforts are focused on all phases of missile defense operations; the boost phase, midcourse phase, and terminal phase. The Army is a major contributor to the joint capability of missile defense.

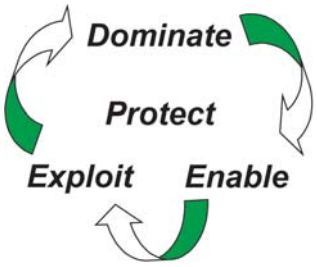
The Army employs a holistic concept for air and missile defense to counter theater ballistic missiles (TBMs), cruise missiles (CMs), unmanned aerial vehicles, tactical air-to-surface missiles, rockets, artillery and mortars, and rotary/fixed winged aircraft threats. The Army enhances Joint Force protection by contributing to the Joint Force's common operational picture (COP) and the Joint Force AMD architecture. The synergy of these activities, in concert with the Army's active, passive, and offensive attack operations, provides the Joint Force increased capabilities to defeat the threat, along with advanced warning of threat intents.

The Army AMD program is aligned with recommendations of the Defense Planning Guidance and the 2001 Quadrennial Defense Report and supports attainment of DOD's critical operational goals, the *Army Transformation Roadmap*, and *Joint Vision 2020*. The Army is accelerating its cruise missile defense capability to meet this emerging threat. The critical components of this capability include Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), Surface Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM) and integrated fire control. JLENS will provide an elevated, enduring, wide-area surveillance and fire control sensor to the Joint Force.

Our Army is pursuing the most comprehensive transformation of its forces in the past century as part of the Joint effort to transform America's military to protect our national security interests in the Future Operational Environment. AMD transformation is an essential part of achieving the capabilities required for Joint and Army Future Force success.

AMD transformation is shaped by changes in the future operational environment as well as a number of other factors. Collectively, these factors compel comprehensive changes in AMD DOTMLPF.

The desired warfighting end state of AMD transformation efforts is the attainment of the following vision:



We will provide joint and combined arms warriors with mission-tailored capabilities to **dominate**, **enable** and **exploit** the third dimension battlespace and **integrate theater operational protection** in support of UA, UE, and Joint Commanders in the Future Operational Environment.

AMD Transformation Imperatives. The four elements highlighted in the vision statement—Dominate, Enable, Exploit and Protect—are imperatives that will help focus AMD transformation. Each element of the Dominate-Enable-Exploit-Protect cycle contributes synergistically to the other elements. The spiraling effect of this cycle will enable JIM forces to achieve four of the Defense Transformation Planning Guidance (TPG)

Operational Goals—protecting critical bases of operation; projecting and sustaining U.S. forces in distant anti-access and area-denial environments and defeating anti-access threats; denying the enemy sanctuary (third dimension), and leveraging information technology for joint command, control, communications, computer, intelligence, surveillance and reconnaissance (C4ISR) operations. Current Joint AMD forces, while performing superbly during OIF, are inadequate to meet the Dominate, Enable, Exploit, and Protect imperatives in the Future Operational Environment. Army AMD transformation is addressing applicable capability gaps as part of a larger Joint AMD transformation effort. As in any successful operation, the transformation of AMD is led by Soldiers and leaders exhibiting the warrior ethos and an expeditionary mindset—Soldiers first, trained and educated on theory, history, doctrine, and achieving joint experience earlier in their career.

Dominate the Third Dimension. Army AMD will help dominate the third dimension, interdependently with JIM forces, at strategic, operational, and tactical levels, through joint attack operations; joint, layered active defense operations; joint passive defense measures; and integrated battle command. Modular, scalable, multifunctional AMD task forces will be employed when and where required to deter and dissuade adversaries from using air and missile threats against the Homeland, friendly nations outside a Regional Combatant Commander's (RCC) area of responsibility (AOR), and critical bases of operation and selected JIM forces/high-value assets (HVAs) inside the RCC's AOR. AMD forces will reduce the warfighting options available to adversaries, helping integrate and execute JIM offensive and defensive operations to deny enemy launch points, kill enemy asymmetric air and missile threats on the ground before they can be launched; proactively kill in the air during ascent and midcourse phases of flight while the threats are still within the enemy's battlespace; and proactively kill in the air during the terminal phase of flight, at sufficiently long ranges to preclude target debris from harming friendly forces or assets.

Enable the Third Dimension. AMD will help enable the third dimension by integrating its sensor and battle command elements into the joint distributed network and providing continuous surveillance information to help develop the single integrated air picture portion of a three-dimensional common operational picture. These AMD sensors and battle command elements will provide Joint third dimension situational awareness and understanding (SA/SU); provide Army linkage to the Joint airspace identification and engagement authority; facilitate planning, coordination and synchronization of airspace activities; help enable trajectory clearance for ground-to-ground, ground-to-air and air-to ground fires; and protect friendly aerial objects. Mission tailored AMD will destroy enemy aerial RSTA beyond standoff, contributing to friendly force ability to see first by forcing the enemy to see last.

Exploit the Third Dimension. By dominating and enabling in the airspace, JIM forces can better exploit it. AMD supported JIM forces will exploit the third dimension by using it to conduct inter- and intra-theater Operational Maneuver From Strategic Distances and to sustain noncontiguous forces via air. Modular, multifunctional AMD task forces will be C130-deployable and will help enable the force to project and sustain in an anti-access environment by protecting critical bases of operation and protecting Joint vertical entry forces. Army AMD ground and elevated sensors will provide extended range surveillance of aerial and ground targets that

can be exploited to support offensive and defensive NLOS engagements. AMD elevated sensors will be multi-functional platforms providing long endurance communications relays and ISR to enable commanders to effectively integrate, coordinate and synchronize warfighting operations with dispersed forces on the nonlinear battlefield. AMD supported JIM forces will leverage space and aerial ISR capabilities to support joint attack operations and provide early warning of air and missile attack to at-risk forces and civilian populations.

Integrate Theater Operational Protection. AMD will play a key role in integrating theater operational protection in support of the JFLCC and or Joint Force Commander. The functional tasks associated with operational protection include offensive and defensive theater air and missile operations (TAMO), NBC reconnaissance and defense, HVA protection, Joint Rear Area (JRA) route security, physical security, operations security, defensive information operations, anti-terrorism operations, host nation integration, and post-attack impact mitigation. In addition to integrating operational protection, AMD forces contribute to maneuver commander force protection at tactical levels providing mission tailored forces for missions such as convoy protection and active Lines of Communication (LOC) protection. The Army Air and Missile Defense Command Post (AAMDC) will integrate and synchronize TAMO, with joint attack operations, active defense, passive defense and C4 operations in the theater. In a role established during OIF, AAMDCs will also integrate other aspects of operational protection in the JRA to include: recommending operational protection priorities to the Commander; leading theater operational protection boards; and overseeing vulnerability assessments of JRA priorities. The AAMDCs will recommend protection measures needed to optimize the JIM force's protection stance and monitor execution. AAMDCs would be the logical nucleus of any newly formed Theater Protection headquarters at Unit of Employment "Y" (UEy) level.

Discussion of Key AMD Materiel Programs

Patriot

Description. Patriot is a corps and echelon above corps (EAC) AMD system that can simultaneously engage and destroy multiple targets at varying ranges and altitudes. It is the world's only battle-proven theater AMD system and will be a key AMD element for the next 25 years. The Patriot Advanced Capability-3 (PAC-3) provides remote launch capability; increases range, altitude, and firepower with new hit-to-kill missile and ground support equipment; and engages multiple maneuvering and nonmaneuvering theater ballistic missile (TBM), air-breathing threat (ABT) and cruise missile (CM) threats. Patriot recapitalization is ongoing to maintain the operational capability by bringing existing Patriot assets to a "like new" (zero miles/hours) state, thereby meeting the future Army requirements. PAC-3 system upgrades are planned to counter evolving threats, improve joint interoperability, and increase surveillance and detection capabilities are required as part of evolutionary development. Additional system

upgrades include the medium and high-range resolution waveforms, a dual traveling wave tube, and a new exciter to the radar; upgrades to the battalion communications equipment; and the ability to remotely locate launchers up to 30 km from the radar. These changes will improve search, detection, track, and discrimination by the radar, increase battlespace awareness, and improve communications. The Army will use biennial increment/block development approaches to increase the Patriot's effectiveness.

Program Status. The FY05-09 program plan funds the upgrade and modernization of PAC-2 units to PAC-3 units and Patriot recapitalization efforts. Currently, only eight of ten AC Patriot battalions are funded for upgrades to PAC-3, resulting in a mixed force of battalions with significantly different capabilities. PAC-3 Ground Support Equipment (GSE) upgrades are in procurement. The PAC-3 missile is in LRIP with 100 missiles contracted for FY03 and 108 missiles contracted for FY04. The AAO is 2,200 PAC-3 missiles; however, only 1,234 missiles are funded in the FY05-09 program plan. The Joint Theater Air and Missile Defense Organization (JTAMDO) missile inventory analysis pushes the PAC-3 missile requirement above 3,200. Cost reduction initiatives for the PAC-3 missile are underway to produce cost savings that will be used to buy additional missiles.

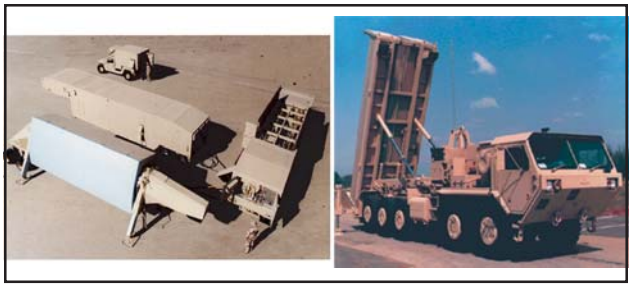
Medium Extended Air Defense System (MEADS)

Description. MEADS is an international cooperative effort with Germany and Italy. MEADS, designated by Army leadership as a "clearly transformational" system, is a corps and EAC AMD system that is scheduled to replace Patriot starting in FY15 and completing in FY28. It offers a significant improvement in tactical mobility and strategic deployability, as it requires 50 percent less airlift than Patriot and can be moved intra-theater with C-130s and helicopters. It will use a netted, distributed architecture and modular, configurable battle elements, which allows it to integrate with other airborne and ground-based sensors to provide a robust, 360-degree defense. MEADS is born joint and will provide continuous coverage alone or integrated with other Army, joint, and multinational air and missile defense systems in the corps/division area. MEADS international development effort ensures integration with our allies. The system's distributed and open architecture facilitates the continuous exchange of surveillance and fire control information to allow for a more effective theater air and missile defense.

Program Status. The current budget plan funds the completion of the risk-reduction effort. The next phase is SDD that will include the development of prototype MEADS major end items (MEI). Beginning in FY04, the Patriot PAC-3 and MEADS programs were combined to capitalize on the resources available to both programs. This combined aggregate program provides for the spiral development and incremental fielding of MEADS MEI. This incremental fielding approach reduces sustainment costs while providing for fielding of increased AMD capability across the force earlier. This approach offers the most efficient use of valuable resources in that it eliminates dual development and sustainment efforts while providing maximum flexibility in regards to funding and changing warfighter requirements. Current program planning provides for the

introduction of the objective launcher and BMC4I capabilities in FY09. The complete transformation of Patriot would begin in FY15 with the introduction of the ground-based sensors.

Terminal High Altitude Area Defense (THAAD)



Description. THAAD is designed to defend against short- to medium-range ballistic missiles at long ranges both inside and outside the atmosphere. THAAD will provide near leak-proof protection for largely dispersed critical U.S. and allied forces and geopolitical assets. THAAD's capability to intercept at both endo- and exo-atmospheric altitudes makes effective countermeasures against THAAD difficult. THAAD's integration with joint and lower tier systems allows for wide-area cueing and multiple intercept opportunities to significantly mitigate the effects of unitary and submunitions. The weapon system consists of five major components: missiles, launchers, radar(s), Battle Management/Command and Control (BM/C2), and THAAD-specific support equipment.

Program Status. THAAD is a segment of the broader Ballistic Missile Defense System (BMDS), a capabilities-based developmental acquisition program utilizing a block approach. Flight testing begins in FY04. THAAD is projected to begin transition from the MDA to the Army after successful flight testing. The first THAAD fire-unit capability is expected in FY06 with additional off-ramps happening in later years. Neither MDA nor the Army has currently programmed procurement for THAAD, an issue that must be addressed prior to fielding.

Ground-Based Midcourse Defense (GMD) Segment

Description. GMD is a fixed, land-based system designed to provide limited protection to the United States against a ballistic missile attack. The GMD design focuses on ensuring high defense effectiveness against ballistic missile attacks of limited scope (e.g., accidental, unauthorized, or authorized limited launch) in a single operational configuration. The GMD Architecture includes the following system components: GMD Communications Network (GCN), GMD Fire Control (GFC) Node, Missile Communications, Ground-Based Interceptors, Upgraded Early Warning Radars, X-Band Radar, Aegis and the Space Tracking and Surveillance System.

Program Status. GMD is a segment of the broader Ballistic Missile Defense System (BMDS), a capabilities-based developmental acquisition program utilizing a block approach. The Army has served as lead service for GMD (less acquisition) since 1999, and today has refocused its efforts to provide force protection and operational personnel, facilities and

resources for the deployment of a 24/7/365 GMD IOC by 1 Oct 04 with a secondary and non-interfering mission as a test bed. The Defense Planning Guidance directs the MDA to develop options for expanding GMD beyond the test bed.

Sentinel

Description. Sentinel is a maneuver air defense radar system that detects, tracks, classifies and identifies cruise missiles (CMs), UAVS, helicopters, and fixed-wing aircraft to cue short-range air defense (SHORAD) weapons. It is employed in the division and corps area and is C-130-deployable. Data is passed through the FAAD C2 to SHORAD weapons. The Sentinel consists of a radar-based sensor system with its High Mobility Multi-purpose Wheeled Vehicle (HMMWV) prime mover, power, IFF, and command and control interfaces. The Antenna/Transceiver Group has an advanced three-dimensional battlefield air defense radar housed aboard a Light Tactical Trailer (LTT) chassis. The radar employs a modern phased array antenna that automatically detects, tracks, classifies, identifies, and reports targets. Targets can be hovering or fast moving, from nap of the earth to the maximum engagement altitude of SHORAD weapons. The radar operates at X band, transmitting 1,100 pencil beams per rotation. It rotates at 30 rpm (2-second update). The instrumented range and altitude are 40 km and 4 km, respectively. The Sentinel data utilizes SINCGARS AN/VRC-92A and EPLRS AN/VSQ-2 radios. These can provide a track file of more than 60 targets.

Program Status. The program completed its primary procurement of Sentinel radars in FY01 and is currently undergoing a Preplanned Product Improvement (P3I) program to improve its surveillance and tracking capabilities. Sentinel completed fielding in FY03 to Active Army and National Guard units. Additional upgrades and systems modifications are currently scheduled through FY08 for many AC and RC units to take advantages of advances in technology and software upgrades. Enhanced Target, Range, and Classification (ETRAC) modifications will be applied to 20 radars by FY05. The ETRAC modifications consist of two upgrades: Phase 1A improves the radar detection range against low observable and stealthy targets; Phase 1B improves the radar classification of low observable and stealthy targets at extended ranges. The Phase 1B capability for target airframe classification will support the joint identification and target classification function that allows SHORAD weapons to operate at maximum effectiveness.

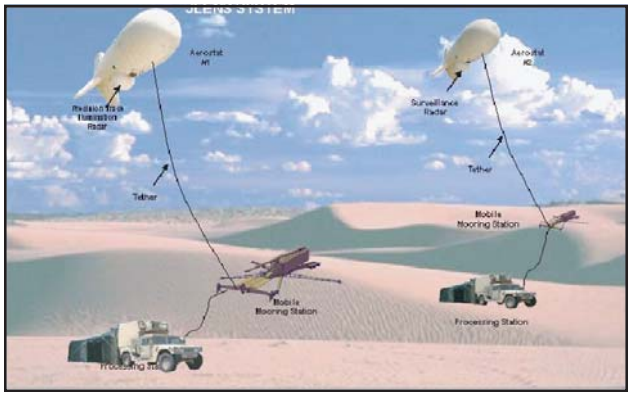
Surface Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM)

Description. SLAMRAAM is an air defense weapon system that will provide protection for the maneuver force and designated joint critical assets against aerial threats. SLAMRAAM is a lightweight, day or night, adverse weather, NLOS system for countering CMs, UAVS, RSTA platforms, and rotary and fixed wing threats with engagement capabilities to 30 km. SLAMRAAM consists of a HMMWV-mounted launcher platform, launch rails, launcher electronics, on-board command, control, communications, and computer (C4) components, AIM-120 Advanced Medium Range Air-to-Air Missiles (AMRAAMs), and Sentinel (ETRAC) Sensor linkable to other joint and Army external sensors.

Program Status. The SLAMRAAM went into the SDD phase in Sep 03. It is funded for development and fielding of one battery in FY06 and one battalion in FY08.

Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS)

Description. JLENS will be a UE or theater-based system using advanced sensor and networking technologies to provide wide-area surveillance and precision tracking of land attack cruise missiles. JLENS is an Army lead joint program. As a key element of the SIAP, JLENS integrates data from multiple sensors and C3I networks and provides correlated data to BMC4I nodes. JLENS consists of surveillance and fire control radars. JLENS provides over-the-horizon surveillance and precision track for broad area defense against land attack cruise missiles and other low-flying threats to ranges adequate to support both the UE and UA. It also functions as a multipurpose aerial platform to enable extended range C2 linkages. JLENS is less expensive to buy and operate than fixed wing aircraft and can stay aloft for up to 30 days, providing 24-hour battlespace coverage over extended areas.

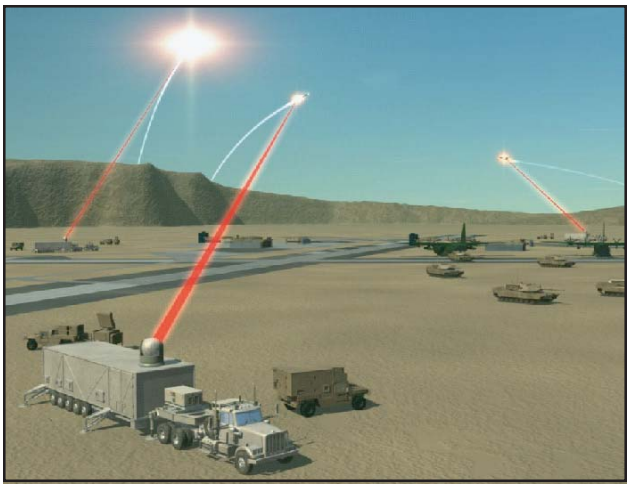


Program Status. JLENS is in the EMD phase. It is using a spiral development approach. Milestone B decision is scheduled for FY05 and Milestone C decision in FY09. Under the VCSA-approved CMD acceleration program both surveillance and fire control radars will be available for contingency deployment in FY08, with FUE in FY10.

Mobile Tactical High Energy Laser (MTHEL)

Description. MTHEL is a combined U.S. and Israeli effort to develop a mobile High Energy Laser Weapon system prototype that is optimized for acquiring, tracking, engaging, negating or destroying rocket, artillery and mortar threats but will also provide a capability against short-range ballistic missiles (SRBM), UAVS, CMs, and air-to-surface munitions. In the near term, deuterium fluoride chemical laser technologies equipped MTHEL will provide cost-effective kills while the objective solid-state laser technologies mature. The MTHEL prototype may be further developed to integrate into existing air defense architectures. A primary objective of the effort will be to provide a prototype capability for use in the development of tactics, techniques and procedures.

Program Status. The FY05-09 program plan funds the development of system technical



requirements, extended lethality testing, and risk reduction to support preliminary and critical design reviews and subsequent fabrication of the prototype by the end of FY07. The prototype development effort will culminate in operational and residual lethality testing through FY09.

Joint Tactical Ground Station (JTAGS) Multi-Mission Mobile Processor (M3P)

Description. The M3P is a P3I of the current, operationally proven JTAGS system. M3P is being procured as the mobile ground segment for the Space Based Infrared System (SBIRS), the successor to the Defense Support Program (DSP). M3P is a transportable missile warning and communications system that receives and processes direct downlink data from DSP and SBIRS sensors. The system is capable of supporting simultaneous operations in multiple theaters and provides the theater combatant commander with organic in-theater tactical threat warning data for potential point targets or the AOR in total. In addition, SBIRS and M3P will provide battlespace characterization data for situational awareness. JTAGS will interface with DCGS-A to provide warning and situational awareness data down to the tactical command level. The M3P infrared data processor and communications equipment is contained in a 42-foot van and includes two 100 kW generators, three 5-ton cargo trucks, one 5-ton tractor, three tri-band antennas, and one HMMWV.

Program Status. The JTAGS program is incorporating a block acquisition approach to upgrade to the M3P configuration and meet objective performance requirements. This approach secures an evolving and increasing capability to access the similarly evolving data provided by DSP sensors as the SBIRS constellation replaces the aging DSP inventory. Block 1 assures the M3P-DSP compatibility. The Army will field six DSP-compatible M3P systems beginning in 4QFYO5. The transition to Block 2 will occur as the SBIRS High Earth Orbit (HEO) and Geosynchronous Earth Orbit (GEO) satellites are launched and assume operational capability. The Army will upgrade the six systems with GEO/HEO software beginning in 2QFYO9. M3P Block 3 is planned to incorporate data from the technologies developed by the MDA and their development efforts with the Space Tracking and Surveillance System (formally SBIRS Low). MDA is conducting technology demonstrations that will lead to a Low Earth Orbit (LEO) constellation that will support the Ballistic Missile Defense System and strategic and tactical missile warning.

AMD Summary

The Army is transforming its AMD capabilities toward a network-centric system of systems capability, which synergistically integrates all sensors, weapons, and BMC4I. At the center of this transformation is an Integrated Fire Control (IFC) capability, which integrates and manages the fires of all the contributing systems to effectively and efficiently negate the threat. Implied in the implementation of the IFC capability is the standardization of the interfaces between weapons, sensors, and battle managers. This future architecture will enable the distributed support of engagements with available sensor assets not limited to system-centric organic sensors. The recent acceleration of a CMD capability includes the need to implement an IFC capability across Army and joint AMD, due to the low altitude approach of cruise missiles and the necessity for elevated fire control sensors such as JLENS. Without IFC, CMD would be neither effective, nor efficient. However, through the integration of elevated fire control and surveillance sensors, with multiple ground-based interceptors, the Army will have a multi-layered, distributed capability to negate not just cruise missiles, but all air-breathing threats.

CBRNE Defense Capabilities

The Army's dedicated CBRNE defense units, corps of trained defense experts, and enhanced nuclear, biological, and chemical medical treatment capabilities, significantly mitigate the effects of threat CBRNE weapon employment. The Army's concept to employ "focused defense" against CBRNE weapons enables units to operate at the lowest required protective posture without increasing risk to the soldier. This protection extends throughout the full spectrum of operations to include homeland security. The Army is augmenting installation commanders with the ability to respond to terrorist and CBRNE attacks through dedicated force structure and training.

The Army is activating a CBRNE operational headquarters in FY04. This HQ will be a "one stop shop" for CBRNE matters. They will integrate, coordinate, deploy and provide trained and ready forces to respond to CBRNE incidents both at home and abroad. They will command and control both the Explosive Ordnance Disposal and Technical Escort Units.

CBRNE defense systems, smoke, and obscurants and their enabling technologies allow the Army to fully achieve force protection, information dominance, and full-dimensional protection in a WMD environment. The Army's CBRNE defense strategy is to employ focused defense against CBRNE threats so that only units directly affected by the hazard would be warned to take protective measures. Using focused defense, large numbers of units will no longer assume a full protective posture as a precautionary measure. Focused defense allows units to operate in the lowest required protective posture without unacceptably increasing the risk to Soldiers. The Army's obscuration strategy is to deny the threat's use of the electromagnetic spectrum while preserving our ability to exploit it at will.

In addition to providing the means of general CBRNE defense and obscuration common to all units, the Army provides increased CBRNE defense and obscuration capability with specialized chemical units. CBRNE reconnaissance and surveillance units with their point and standoff detectors and battlefield management/C2 procedures, are the principal means for contamination avoidance. Biological detection units provide shortened response times for divisions and corps to initiate their medical response to the growing threat of biological warfare agents. Decontamination units restore combat power after units are

contaminated. Information dominance is supported through development and employment of obscurants that are effective in the visual, infrared, and millimeter ranges.

The CBRNE defense mission area also includes the Army's efforts to address homeland security. Today, the nation is beginning to understand that CONUS installations and power projection platforms are no longer sanctuaries. The very ability to execute our force projection strategy requires CBRNE-focused defense over strategic forces and the means to employ them from premobilization through conflict termination and demobilization.

CBRNE Defense Modernization

The Army's CBRNE defense modernization effort is focused on minimizing casualties and preserving combat power in a CBRNE environment and creating information superiority through the use of obscurants. Operationally, if the enemy has an offensive CBRNE capability, our primary goal is to deter threat use. If deterrence fails, our mission is to defend against a CBRNE attack with minimal casualties and degradation, allowing commanders to quickly restore full combat power and continue their mission across the full spectrum of operating environments.

The principles of CBRNE defense are sense, shape, shield, and sustain. The principles of obscuration are sense, shape, shield, attack, and deceive. These principles support the patterns of Army and joint operations designed to provide full-dimensional protection and information dominance. In providing CBRNE defense and obscuration systems in support of the Army's transformation strategy, the Army will equip its specialized Chemical units and provide CBRNE defense and obscuration items common to all units in accordance with the three tenets of the Army's overall modernization strategy of (1) focusing its S&T efforts on the Future Force, (2) meeting immediate SBCT operational needs, and (3) maintaining and improving the warfighting capabilities of the rest of the Current Force through a judicious combination of selected modernization, recapitalization, and sustained maintenance of essential systems. The following paragraphs elaborate on just some of the key CBRNE materiel programs in the Army's modernization plans, realizing there are numerous additional CBRNE programs in development.

Discussion of Key CBRNE Materiel Programs

Vehicle Obscuration Smoke Systems (M6 and M7)

Description: Vehicle Obscuration Smoke Systems provide an immediate smoke screen that can obscure threat surveillance, target acquisitions, and weapon guidance systems in the visual through the infrared spectrum. The system provides approximately 90-120 seconds of obscuration, which enable the vehicle to maneuver out of the immediate threat area. The M6 countermeasure discharger is installed on Stryker platforms to provide this capability. The M7 Light Vehicle Obscuration Smoke System provides this capability for Up-Armored HMMWVs. Both systems utilize 66mm grenades and a launcher configuration of four tubes. Multiple launcher systems are utilized to provide all around screening capability.

Program Status: The M6 program is currently funded to field all SBCTs. The M7 is currently funded to field approximately 20 percent of the AAO.

M56 Wheeled Smoke System (Coyote)

Description. The M56 Coyote is a wheeled vehicle, which provides large area multispectral screening for maneuver and support forces. The M56 Coyote can generate large area obscurants throughout the battlespace to counter enemy reconnaissance, surveillance, and target acquisition systems. Missions include providing static and mobile visual, IR, and/or MMW screening in the form of a haze, blanket, and curtain. Major components include a turbine smoke generating system. The M56 uses a M1113 HMMWV chassis. The M56 carries enough fuel and obscurant material to continuously produce visual smoke for up to 90 minutes and 30 minutes of infrared screening smoke. A P3I will add a 30-minute MMW obscuring capability that will defeat enemy radar on RSTA devices and weapon systems. A two-person crew operates the M56 and has the capability to counter the threat arising form the wide proliferation of advanced visual and IR sensors.

Program Status: Fielding of the M56 continues through FY05. Application of the MMW P3I begins in FY06 with the application of 291 modification kits to previously fielded systems. In FY07, an additional 270 M56A1 systems will be produced containing the MMW enhancement. Currently, 953 systems are funded from the AAO of 1,036 systems.

Chemical Biological Protective Shelter (CBPS)

Description. CBPS replaces the M51 Collective Protection Shelter. It consists of a Lightweight Multipurpose Shelter (LMS) mounted on an Expanded Capacity HMMWV variant and a 300 square foot air beam supported soft shelter. CBPS provides a contamination free, environmentally controlled working area for medical, combat service, and combat service support personnel to obtain relief from the continuous need to wear chemical-biological protective clothing for 72 hours of operation. All ancillary equipment required to provide protection, except the generator, is mounted within the shelter.

Program Status. Interim fielding of 64 systems were provided to OIF units. In Sep 03, CBPS received approval for Milestone III and type classification and recommended for full materiel release. FUE is scheduled for 2QFY04. The CBPS P3I program was initiated in FY02 to improve the CBPS system and develop versions suitable for forward-deployed medical units within airborne/air assault and heavy divisions.

Collectively Protected Deployable Medical System (CP DEPMEDS)

Description. CP DEPMEDS enables field Combat Support Hospitals (CSH) to sustain medical operations in a chemical/biological (CB) environment. CP DEPMEDS provides a clean, toxic-free, environmentally controlled patient treatment area, maximizing the use of existing equipment to the Hospital Unit Base of fielded Deployable Medical Systems/ Medical Reengineering Initiative CSHs for the Army and to Air-Transportable Hospitals for the Air Force. The program is a multi-Service effort between the Army and Air Force. All Services use field hospitals, which are comprised of the same building block components. Hospitals vary in size and configuration between the Services. Collective protection is provided

through the addition of M28 Collective Protection Equipment (CPE), CB protected environmental control units and heaters, CB protected latrines and water distribution systems; low-pressure alarms and other integration components necessary for a fully operational CB-protected hospital facility. All components are designed to integrate into fielded hospitals. Components will be packaged as a set to be provided to units fielding to threat areas. The CP DEPMEDS is installed during set up of the hospital.

Program Status. The FY05-09 program plan supports procurement of 13 CP DEPMEDS and five CP DEPMEDS cold weather kits to sustain operations in cold climates. The CP DEPMEDS components being procured are necessary to provide a fully operational collective protection capability to fielded hospitals. The components are being packaged as a set that will be provided to hospitals deploying to a CB threat area. Five CP DEPMEDS will be prepositioned to support rapid deployment and the remaining placed in Army War Reserve.

Joint Vaccine Acquisition Program (JVAP)

Description. The JVAP manages full-scale licensed vaccine production, stockpiling, testing, and distribution. Products to be procured and stockpiled under the JVAP include recombinant botulinum, next generation anthrax, plague, smallpox, tularemia, and Venezuelan equine encephalitis. The program also supports potency and integrity testing as well as quality assurance for Investigational New Drug (IND) vaccines transferred from the Salk Institute. Medical programs such as this under the Joint Biological Defense Programs provides U.S. forces with Food and Drug Administration (FDA) approved vaccines to protect against current and emerging threats, which could be deployed against maneuver units or stationary facilities in the theater of operations.

Program Status. FY05 funding will procure the FDA-licensed Anthrax Vaccine Adsorbed (AVA) doses to support the Secretary of Defense's immunization program. Funding also supports quality assurance efforts for the IND vaccines transferred from the Salk Institute to ensure their availability for contingency use.

Joint Service General Purpose Mask (JSGPM)

Description. JSGPM is designed to replace the M40/M42/MCU-2/P series mask. JSGPM will increase the Soldier's ability to perform mission essential tasks because physiological burdens, such as breathing resistance, will be substantially reduced and the field of vision will be significantly improved. A key feature of the mask will be reduced weight and bulk.

Program Status. JSGPM replaces existing mask systems (M40/M42 and MCU-2/P series) at the end of their 10-15 year service life. Fielding is scheduled to begin in 4QFY06.

Joint Service Lightweight Integrated Suit Technology (JLIST)

Description. JLIST is an all-Service program and, like the Saratoga, provides both vapor and liquid protection from the damaging effects of all known biological and chemical agents and

radiological particles. The JLIST ensemble includes a blouse, trousers, and protective footwear (and a planned glove) and will replace the currently fielded Saratoga when the shelf life for that suit expires. The program provides state-of-the-art protection, reduced heat stress, full compatibility with all interfacing equipment, longer wear, launderability, a single technical data package, and technical data manual, a standard tariff, split issue to improve fit and reduce inventory, and flame retardancy. JLIST promotes commonality and standardization to maximize resources.

Program Status. Soldiers in OEF and OIF employed the JLIST ensemble. Procurement continues through FY05 for the JLIST ensemble, which includes 342,400 overgarments and 246,154 boots. RDT&E will continue through FY08 to provide upgrades and improvements for heat stress reduction and dusty agent protection.

M93/M93A1 Nuclear Biological Chemical Reconnaissance System (Fox)

Description. The Nuclear, Biological and Chemical Reconnaissance System (NBCRS)–Fox Block I Modification (M93A1) contains an enhanced CBRN sensor suite consisting of the M21 Remote Sensing Chemical Agent Alarm (RSCAAL), MM1 Mobile Mass Spectrometer, Chemical Agent Monitor/ Improved Chemical Agent Monitor (CAM/ICAM), AN/VDR-2 Beta Radiac, and M22 Automatic Chemical Agent Detector/Alarm (ACADA). The M93A1 Fox is also equipped with an advanced GPS/ Autonomous Navigation System (ANAV) that enables the system to accurately locate and report agent contamination. It has an over-pressure filtration system that fully protects the three-person crew while conducting its CBRNE reconnaissance mission.

Program Status. The M93/M93A1 systems were deployed with every major combat formation as part of OIF and continue to support OIF units as well as elements of the Iraqi Survey Group (ISG). The FY05-09 program plan funds complete fielding of this system and upgrades of existing systems.

M31/M31A1/M31E2 Biological Integrated Detection System (BIDS)

Description. The BIDS consists of a shelter mounted on a dedicated vehicle (M1097A1 HMMWV) and equipped with a biological detection suite employing complementary technologies to detect large area biological attacks. It can detect all types of biological warfare (BW) agents in less than ten minutes, and identify any eight agents simultaneously in less than 30 minutes.

Program Status. The nondevelopmental item (NDI) version of the BIDS is fully fielded. The BIDS (M31/M31A1) was extensively employed in support of the global war on terrorism (Operations Noble Eagle, Enduring Freedom and Iraqi Freedom). The P3I version is in full rate production with the anticipated completion of fielding to the 13th Chemical Company in 3QFY04. Upgrades are continuing with both the NDI and P3I versions. The M31E2 version is completing final operational testing and began fielding in 4QFY03 with a projected completion in FY05.

Stryker-NBCRV

Description. The Stryker-NBCRV will incorporate the Block II NBCRV integrated chemical and biological point detectors that will allow on-the-move, standoff BC agent detection. The Chemical Biological Mass Spectrometer (CBMS) Block II will improve the detection and identification of liquid chemical agents while providing a first-time biological agent detection capability to the reconnaissance platform. The Block II sensor suite will automatically integrate contamination information with data from onboard navigation and meteorological systems and rapidly transmit contamination hazard and clear area intelligence to the appropriate operations center. Integration of the common CBRN technical architecture will allow for expansion/ upgrading of the onboard computers at minimal cost, as well as the command and control of CBRN-sensing UAVS and Unmanned Ground Vehicles (UGVs) in the Future Force system.

Program Status. Stryker-NBCRV Milestone C decision in 2QFY04 will provide for LRIP. Production Verification Testing (PVT) and IOT&E are planned for FY04/05. The FY05-09 program plan funds Stryker NBCRV fielding to all SBCTs.

Joint Biological Standoff Detector System (JBSDS)

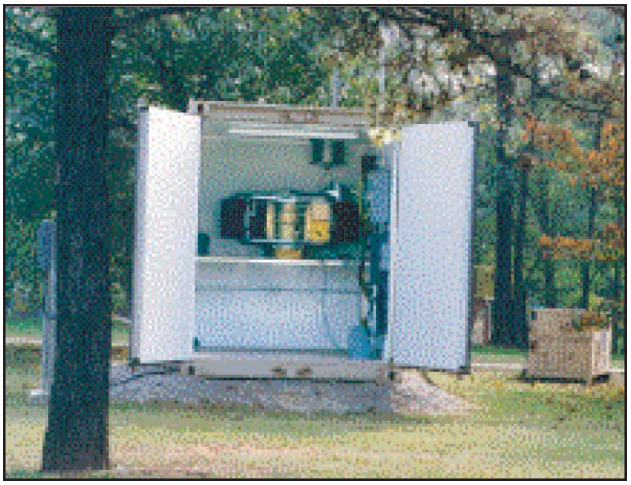
Description. The JBSDS is the first joint biological standoff detection program. The JBSDS will be a standoff, early-warning biological detection system. The system will be capable of providing near real-time detection of biological attacks/incidents, and standoff early-warning detection/warning of BW agents at fixed sites or when mounted on multiple platforms, including NBC reconnaissance platforms. It will be capable of providing standoff detection, ranging, tracking, discrimination (manmade versus naturally occurring aerosol), and generic detection (biological versus nonbiological) of suspected large area BW aerosol clouds for advance warning, reporting, and protection.

Program Status. The JBSDS Block I program is on track for a Milestone C decision and LRIP contract award in 2QFY04.

Joint Portal Shield Detector System (JPS)

Description. The JPS is DOD's first automated, networked biological detection systems. The system uses an innovative network of sensors to increase the probability of detecting a BW attack while decreasing false alarms and consumables. The JPS can detect and presumptively identify up to eight BW agents simultaneously in less than 25 minutes.

Program Status. The JPS operates in Pacific Command (PACOM) and Central Command (CENTCOM) areas of operation. Twelve additional sites have been directed by the Deputy Secretary of Defense (DEPSECDEF) for PACOM and CENTCOM Combatant Commanders. The Defense Emergency Response Fund (DERF) funds the upgrade of 237 Portal Shield units with Biological Aerosol



Warning Sensor (BAWS). Fifty-four additional units will be procured as part of CB Installation Protection Equipment.

Joint Chemical Agent Standoff Detection System (ARTEMIS)

Description. The ARTEMIS will provide an autonomous active standoff sensor system that will detect and identify chemical warfare agents and toxic industrial chemicals in the form of vapors, aerosols, and rains in ranges and sensitivity levels sufficient to institute applicable contamination avoidance procedures and conduct reconnaissance operations. The system will have the ability to perform standoff detection and warning, agent identification, and detailed mapping. The detailed mapping capability will provide predictive levels of contamination based on agent concentration.

Program Status. A formal requirements document is currently submitted for approval for the ARTEMIS Increment 1 Milestone B review.

Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD)

Description. JSLSCAD is a lightweight, passive, standoff, chemical agent detector capable of providing up to 360 degrees on-the-move vapor detection from a variety of tactical and reconnaissance platforms at distances up to 5 km. Enhanced early warning for contamination avoidance is the competency of the system. When avoidance is not possible, JSLSCAD will provide extra time for Soldiers to don full protective equipment.

Program Status. The JSLSCAD is in a five-year developmental effort that includes ground-, air- and sea-based platforms. Production is scheduled to start after Milestone III in 3QFY04. Three follow-on production options are planned: the first option is to refurbish the test units; the second option is for initial production; the third option is for full-scale production.

Joint Chemical Agent Detector (JCAD)

Description. JCAD will be a combined portable monitoring and small point chemical agent detector for individual Soldier applications. This hand-held, pocket-sized detector will be designed to automatically detect, identify, and quantify chemical agents.

Status. The contractor is currently building prototypes, which are undergoing agent testing.

Joint Service Light Weight NBC Recon System (JSLNBCRS)

Description. JSLNBCRS provides point and standoff intelligence for real-time field assessment of NBC hazards. The system is a vehicle-mounted suite of equipment and

software designed to detect, collect, analyze, mark, and disseminate NBC data.

Program Status. IOC is scheduled for 1QFY05. FUE is projected for FY06.

Joint Warning and Reporting Network (JWARN)

Description. The JWARN provides standard integration and analysis of NBC detection information with command, control, communications, computers, information and intelligence (C4I2) on the battlefield. JWARN automates the NBC warning and reporting processes now performed manually throughout the Services. The JWARN will consist of COTS hardware with JWARN software for C4I2. JWARN is being developed for deployment with NBC detectors in the following battlefield applications: combat and armored vehicles, tactical vehicles, vans, shelters, shipboard application, area warning, and fixed sites.

Program Status. IOC for the COTS was completed in 4QFY99 and IOC with the C4 and ISR systems within the Global Command and Control System-Army (GCCS-A) is scheduled for 3QFY04.

Joint Service Family of Decontamination Systems (JFSDS)

Description. The JSFDS program will provide the warfighter with a family of environmentally friendly decontaminants and application systems to remove, neutralize and eliminate NBC hazards posing threats to military operations. The JSFDS will consist of a Joint Service Man-Portable Decontamination System (JSM-PDS), a small-scale and a large-scale Joint Service Transportable Decontamination System (JSTDS), a Joint Service Stationary Decontamination System (JSSDS), and a Joint Service Personnel/Skin Decontamination System (JSPDS).

Program Status. The initial increment for these systems will provide the warfighter with an enhanced fixed-site, equipment and personnel decontamination capability. Follow-on increments will increase the capability through technology insertion. FY05 funding will procure 169 LRIP decontamination systems for use in operational testing and ultimate fielding.

Joint Service Sensitive Equipment Decontamination (JSSED)System

Description. The JSSED will fill a need to decontaminate chemical and biological warfare agents from sensitive equipment, vehicle and aircraft interiors, and associated cargo. The JSSED will consist of at least two distinct systems: an XM25 system for sensitive items and equipment and a second system to concentrate on aircraft/vehicle interiors. A proposed P3I will include the ability to decontaminate the aircraft/vehicle interiors on the move while the aircraft/vehicle remains in flight/operations.

Program Status. The technology for the XM25 has transitioned to development with an approved requirements document to be issued in Mar 04 for Increment 1.

M100 Sorbent Decontamination System (SDS)

Description. The SDS is intended to replace the M11 and M13 Decon Apparatuses: Portable (DAPs) currently employed in operators' spray-down operations associated with immediate decontamination. The SDS uses a reactive sorbent powder to remove chemical agents from surfaces. Use of the SDS decreases decontamination time and eliminates the need for water.

Status. Currently being fielded to all users on a free first issue basis. The M100 SDS is also currently available for purchase using normal supply channels.

Joint Biological Agent Identification and Diagnostics System (JBAIDS)

Description. The JBAIDS program is the first effort by the DOD to develop and field a common medical test equipment platform among all the Services. JBAIDS will identify both BW agents and pathogens of operational concern, and will be used as a diagnostic tool by medical professionals to treat patients. A multi-block configuration, spiral development and fielding approach is proposed. JBAIDS is comprised of platform test equipment hardware (includes computer and case), assay test kits specific to BW agents, and protocols for sample preparation and system operation.

Program Status. JBAIDS is currently in the SDD phase. In FY04, the JBAIDS program will exercise production options for 25 JBAIDS with another 141 planned in FY05.

Non-invasive Filler Identification (NFI) System

Description. The NFI System provides a nondestructive method of identifying the filler of unexploded ordnance (UXO) without having to open the munitions case, which might result in detonation or release of chemical, biological or radioactive material. NFI enables the EOD Soldier to determine the appropriate procedures and safety precautions to be followed in eliminating the UXO hazard. It is one-person portable, computerized and ruggedized.

Program Status. The AAO is 127. The institutional training school and EOD units in operational theaters will be fielded with 21 systems in FY05.

Large Improvised Explosive Device (IED) Countermeasures

Description. Large IED countermeasures is a family of systems that allows EOD Soldiers to rapidly access and disrupt large (vehicle) IEDs (over 100 lb net explosive weight) without having to access the vehicle to employ a disrupter. The FY05 fielding schedule includes acquisition of the Medium Directional Energy Tool (MDET). The MDET fires a water charge from at least 2 feet away into the vehicle to prevent it from detonating or to minimize damage of detonation (explosive yield). MDET brings a new capability to the battlefield; current procedures require the use of several small IEDs placed on the vehicle, risking immediate detonation.

Program Status. The AAO of 133 is to be fielded in FY05 to EOD units and to Army Prepositioned Stock (APS).

Man-Transportable Robotic System (MTRS)

Description. The MTRS provides a two-person portable, lightweight robotic system capable of being helicopter transported, to give EOD Soldiers remote reconnaissance capability in situations where current Remote Ordnance Neutralization System (RONS) is too big to employ. Experience in the Balkans, Afghanistan, and Iraq has shown the limitations of the current RONS. Small robots provided by OSD Office of Special Technology to EOD forces of all Services for evaluation in Afghanistan and Iraq have demonstrated the need for smaller, portable, robotic systems. Lack of this capability requires EOD Soldiers to physically approach the device and manually perform reconnaissance and render safe procedures in confined spaces. Requirements for additional MTRS as well as classified jamming systems were initiated and validated in response to the increased threat and sophistication of the potential threats.

Program Status. The MTRS AAO of 133 is funded in FY05-06. Lessons learned from the EOD mission in OIF/OEF identified additional requirements for total of 313 MTRSs and block upgrades for FY06-09. These requirements will be considered in the FY06-11 program plan build.

CBRNE Defense Summary

Among the significant changes to the future strategic environment, proliferation of WMD is recognized as a principal asymmetric threat capable of providing an adversary military advantage to neutralize overwhelming conventional superiority. Having an effective CBRNE defense is a necessary component of any defense strategy that seeks to demonstrate to the adversary that use of WMD will not gain the advantage sought. Modernizing the force while conducting a robust S&T effort is critical to preventing technological surprise from new CB agents or different employment means. Recapitalizing and maintaining the Current Force is necessary to enable transformation and mitigates risk by extending the useful life of current systems within fiscal constraints. This modernization plan assures a disciplined approach to meeting mission-based requirements of the Current Force and developing enhanced CBRNE defense capabilities for the Future Force.

Space Capabilities Enabling Force Protection

In addition to AMD and CBRNE defense capabilities, military utilization of space capabilities to enable force protection primarily through warning and space control has steadily grown. Space control is an evolving facet of force protection that facilitates freedom of action for maneuver forces and space assets. It involves four interrelated objectives: **Surveillance** of space assets to understand their mission and operations; **Protection** (defensive or offensive) of our space systems from hostile actions; **Prevention** (active or passive) of unauthorized access to and exploitation of our space systems; and, when directed, **Negation** (deny, disrupt, deceive, degrade or destroy ground or space assets or communications links between them) of hostile space systems that place our interests at risk. Our ever-increasing reliance on space combined with the advantages an adversary can garner from both foreign government and commercial space capabilities makes space control a long-term operational priority.

The Army contributes to the nation's space control capability through use of the ground-based space surveillance systems on Kwajalein Atoll. When not committed to Ballistic Missile Defense R&D, these radars

help the U.S. Strategic Command identify and characterize potential adversary space capabilities.

The Army's only current operational Space Control capabilities are embodied in Big Crow (BC) operated by the Army Space and Missile Defense Command (SMDC) Space Electronic Warfare Detachment. BC is a multifaceted, multi-platform electronic warfare (EW) capability used to assess and stress electronic systems in development. The Army is conducting S&T and RDT&E efforts, developing doctrinal, organizational, and operational concepts and planning an acquisition strategy to bring new Space Control capabilities to the warfighter. The Army has a joint partnership with the USAF to pursue terrestrial-based space control solutions for direct support of Army forces and is preparing for a Milestone A decision for Space Electronic Warfare System (SEWS).

Summary of Protection

The Army's Protection capabilities must continue to improve against an expanding, significant threat arsenal, which includes information operations, terrorist attacks, and other asymmetric threats. The Army's AMD and CBRNE defense modernization programs and leveraging of space-based protection assets are increasingly important to developing these Protection capabilities. These critical systems and the sound, doctrinal operational concepts they support will mitigate these threats by improving freedom of action for friendly forces during deployment, maneuver, and engagement and providing better protection at all echelons, both at home and abroad. In this way, Army Protection capabilities will enable Force Application capabilities of the Joint Force.

Appendix 3: Focused Logistics (FL)

Focused Logistics is the ability to sustain the Joint Force with the right personnel, equipment, supplies, and support in the right place at the right time, and in the right quantities, across the full range of military operations. This is made possible through a real-time web-based information system that provides accurate, actionable events as part of a common operational picture, effectively linking the operator and logistician across joint forces. Key support functions include deployment, distribution, global mobility and the ability to sustain the force and provide medical support to combat forces.

This appendix provides a brief discussion of the Army's FL capabilities that support required Joint Force capabilities and the key materiel programs associated with these capabilities. Highlighted are improvements to the deployment distribution process, the equipment-lift capabilities necessary to make the Army more strategically responsive, and key materiel programs that provide assured mobility and force sustainment.

Improving the Deployment Distribution Process

The central responsibility of the Army under Title 10, USC, is to conduct prompt and sustained operations on land as a component of the Joint Force. Fulfilling this responsibility rests, to a very large extent, on the Army's ability to rapidly project lethal, survivable and sustainable combat power as part of the Joint Force. While the Army is largely dependent on Joint Force projection capabilities, we continue our own efforts to enhance our deployment capability and responsiveness while reducing our deployment requirements. Our efforts will

continue to enhance our speed and agility in today's threat environment.

We have increased our capabilities to defeat both anti-access and area-denial efforts through speed of deployments, leveraging information technology, modular force design, future concepts and improved equipment. The Army provides unique capabilities to gain, enhance, and maintain assured access. We have reviewed the current security environment and initiated actions to reposition forces and equipment to support today's security environment and tomorrow's emerging threats. Forward-deployed forces, prepositioned stocks, regional bases/flotillas and facilities, assured access through standing agreements with allies and other nations, regional engagement by special operation and conventional forces, and multinational exercises are all instrumental in shaping a position of strength in a given region.

Improving deployment and sustainment of the force requires enhance command and control and information systems that network and integrate information and data across the Joint Force. The Army continues to work toward this standard in our Future Force development. The Army currently has a number of automation systems, each with a joint foundation, that are designed to assist in the overall command, control, movement, and tracking of personnel and equipment during deployments and operations.

The design and emergence of systems such as the Global Combat Service Support (GCSS) Army, Battle Command Sustainment Support System (BCS3), and Transportation Coordinators Automated Information for Movement System II (TC-AIMS II), will enhance the deployment and sustainment of forces by facilitating the exchange of data between Army units and the Combatant Commanders thus providing improved situational awareness and the ability to respond faster to unforeseen circumstances.

Equipment Lift Capabilities

Extensive analysis and wargaming has shown that both current as well as many planned strategic and intra-theater air and sealift platforms do not support future warfighting concepts. Many current sealift platforms require deep-water ports to berth and off load. The availability of such ports is limited geographically to industrial nations and are conspicuously absent in most nations south of the equator.

Further, the limited number of these ports makes them more vulnerable to many anti-access measures and jeopardizes the deployment of the joint warfighting force. Advanced sealift capabilities that provide for brown water and over-the-horizon sealift are critical to support efforts designed to defeat anti-access and area denial methods. High-speed, shallow draft vessels can leverage numerous ports in all areas of the world and thus support the concept of multiple, parallel seaports of debarkation which is fundamental in overcoming anti-access challenges.

Existing strategic air platforms such as the C-5 Galaxy can carry enormous loads but are dependent on world-class airports for both embarkation and debarkation. The C-17 and C-130 provide the only capability today of bypassing these major choke points from appreciable distances while maximizing load capacities. Even so, they are still constrained to at least a 3,000-foot runway and in many cases (weather, terrain, and environment dependent) may require 5,000 to 6,000 feet with sizeable loads. The venerable C-130 is further hampered by significant payload, altitude, and range limitations and cannot be

refueled in mid-air. These capability limitations not only severely constrain our ability to execute assured access strategies, but they demand a nearby intermediate staging base to transload equipment, personnel and sustainment from inter- to intra-theater lift platforms. None of the airlift platforms are suitable for air sustainment, nor can they support rapid shift of maneuver forces and sustainment across the breadth and depth of the battlespace.

To overcome the limitations of these strategic air platforms, larger capacity Super Short Take Off and Landing (SSTOL) and/or Heavy Lift Vertical Take Off and Landing (HLVTOL) platforms are required in substantial quantities for air movement of the Future Force. Shallow draft high-speed sealift and advanced, intra-theater sealift designs are required for austere seaport access. Whether the goals encompass operational maneuver from strategic distances, use of multiple simultaneous austere points of entry, vertical maneuver and envelopment, dominant maneuver, precision engagement and focused logistics, SSTOL and HLVTOL technology solutions are needed sooner rather than later.

These kinds of platforms further provide a quality of versatility and adaptability necessary to enable Army and Joint Force Commanders to adjust movement of forces and sustainment in stride in response to the evolution of the campaign and the enemy's own actions. Funding the S&T and procurement required to bring advanced lift capabilities to the Joint Force is a joint challenge. The Army alone cannot develop, procure and field such systems due to both budgetary and regulatory constraints. Instead, the Army encourages joint S&T emphasis on the following efforts.

Shallow Draft High-Speed Ship (SDHSS). An SDHSS is a strategic ship that can deliver troops, equipment, and sustainment together in sufficient size and at a considerable speed to provide immediate combat power to the Joint Force Commander. Because it has a shallow draft feature, it can bypass established seaports and discharge its combat power wherever there is at least a 10-foot draft and an acceptable offload site. With a C4I suite onboard, commanders can conduct en route planning, receive intelligence updates, and integrate with the Joint Force Commander.

Super Short Takeoff and Landing (SSTOL) Aircraft. The SSTOL is a joint aircraft with the ability to carry two FCS platforms 3,500 miles. It can land on 750 feet of road or field in the joint area of operations, which avoids fixed airfields and adds innumerable points of entry. It provides the Joint Force Commander the ability to achieve operational surprise.

Heavy Lift Vertical Takeoff and Landing (HLVTOL) Aircraft. The HLVTOL is an aircraft with the ability to deliver one FCS within a radius of 1,000 miles. The ability to insert combat vehicles vertically gives the commander unparalleled speed and agility. Generally independent of ground conditions, it enables the Joint Force Commander to conduct vertical envelopment and vertical maneuver, as well as the ability to avoid predictable, linear patterns of operation. It also offers significant benefits to vertical joint logistics over-the-shore.

Discussion of Key Equipment-Lift Materiel Programs

Theater Support Vessel (TSV)

Description. The TSV is the operational version of the strategic SDHSS. It is another source of flexibility and agility within a theater as it allows the Joint Force Commander to insert combat power and sustainment into austere ports worldwide. Supporting Army

Prepositioned Stocks and Joint Logistics Over-the-Shore (JLOTS), the TSV expands the reach and possibilities of prepositioning both on land and afloat. The TSV is a high-speed, 40+ knots, shallow draft sealift platform that will maximize current commercial ferry technology. The TSV provides the capability to conduct operational maneuver and repositioning of intact unit sets while conducting En route Mission Planning and Rehearsal (EMPR). This intra-theater vessel provides the Combatant Commander with increased throughput, increased survivability, increased responsiveness, and improved closure rates. This transport transformation enabler helps obtain force deployment goals as well as achieving full distribution-based logistics.

Program Status. Two vessels are being leased as experimentation platforms to support the objective TSV program. The first vessel, USAV Joint Venture, High-Speed Vessel (HSV)-X1, was shared with the Navy through FY03 and is now an Army only vessel. The second vessel, USAV Spearhead, TSV-1X, is the flagship of an OSD approved ACTD program and is on deployment order to the CENTCOM AOR in support of OIF. Both vessels are currently in Hobart, Australia for annual maintenance period and ACTD modification. The current program of record purchases two vessels in FY08 and two in FY09. The Army and the USMC are combining efforts to determine advantages and disadvantages of combining TSV/HSV into a single joint program.

Precision Extended Glide Airdrop System (PEGASYS)

Description. PEGASYS is a high-altitude capable, autonomously operated precision airdrop system. The system consists of a family of different-sized airfoils, allowing airdrop of weight categories up to approximately 42,000 lbs. PEGASYS is not totally wind dependent and is releasable from altitudes up to approximately 35,000 feet at mean sea level (MSL). Based upon winds and release altitude, 50 km standoff distances are also possible. Space-based GPS technology provides for aerial navigation/maneuverability throughout descent, steering into the wind as necessary, and permitting highly accurate ground touchdown locations. PEGASYS is a critical logistics transformation enabler that facilitates dedicated aerial sustainment and helps achieve full distribution-based logistics.

Program Status. The PEGASYS ORD is in development and will be modified as needed during the upcoming FY04 Joint Precision Air Drop System (JPADS) ACTD. This ACTD will procure three to five of the candidate prototypes for use in the operational demonstration, mature them to a level suitable for operational use, and assure interoperability and communication.

Assured Mobility Capabilities

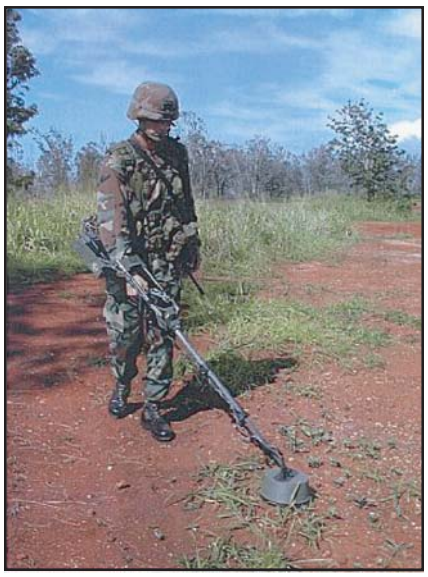
Assured mobility capabilities support Force Application by maneuver forces as well as Focused Logistics by sustainment forces. A critical factor in sustaining operations is the ability of forces to move and to properly maneuver over the depth and breadth of the battlefield while impeding/slowing/blocking our

enemy's movement. OEF and OIF highlighted the enduring importance of systems that provide ground forces the capability of detecting, defeating, and emplacing minefields and other obstacle effects thus allowing unparalleled freedom of maneuver. This capability supports the commander's dominant maneuver capabilities that are critical to gaining the positional advantage needed to retain the initiative and enhance joint precision fires as well as ensuring sustainment force movement remains effective across the distributed battlefield environment.

Discussion of Key Assured Mobility Materiel Programs

AN/PSS-14 Handheld Standoff Mine Detection System (HSTAMIDS)

Description. The AN/PSS-14 is a handheld mine detector capable of detecting metallic and nonmetallic anti-tank (AT) and anti-personnel (AP) mines. This system combines the maturing technology of ground penetrating radar (GPR) and improved metal detection (MD) to provide a high probability of detection for both large and small metallic and nonmetallic AT and AP mines. The AN/PSS 14 will significantly improve detection of the smaller, low-metal AP mines with a probability of detection for all mine types in excess of 95 percent.



Program Status. AN/PSS 14 production began in FY03.

Ground Standoff Minefield Detection System (GSTAMIDS)

GSTAMIDS Block 0

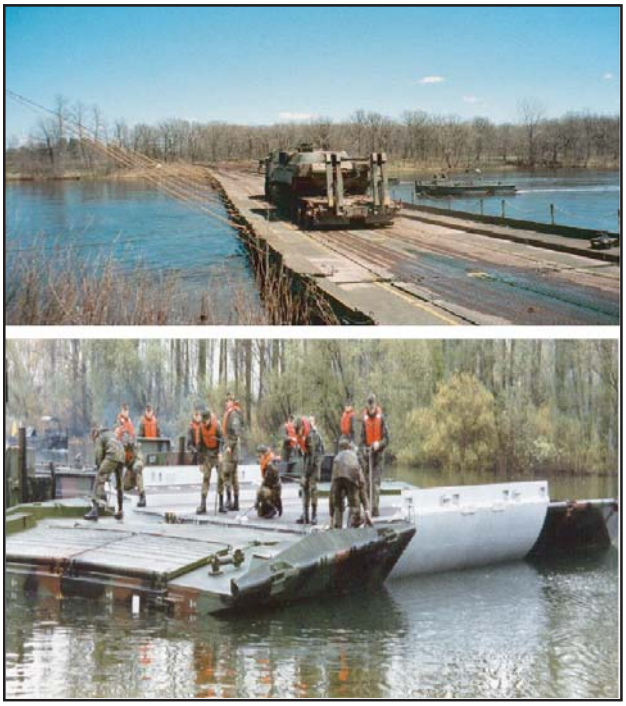
Description. GSTAMIDS Block 0 clears a 20 km route in 12 hours using a remote-operated detection vehicle, Mine Protected Clearance Vehicle (MPCV), and a towing vehicle with proofing trailers. GSTAMIDS Block 1 clears a 40 km route in six hours. The detection vehicle utilizes a multi-sensor mine detection suite consisting of metal detection, ground penetrating radar (GPR), quadruple resonance (QR), and IR to locate all anti-tank mine types. The MPCV provides Soldiers a blast-protected vehicle from which to remotely operate the lead detection vehicle and mine detection subsystems.

Program Status. Production of two GSTAMIDS Block 0 is complete and scheduled for employment in FY04 to support current operations. GSTAMIDS Block 1 begins production in FY07.

Improved Ribbon Bridge (IRB)

Description. The IRB, fielded to Multi-Role Bridge Companies (MRBC), provides a continuous roadway or raft capable of crossing assault vehicles or tactical vehicles over non-fordable wet gaps. The capability of the bridge/raft system is Military Load Class (MLC) 100 Wheeled and MLC 80 Tracked. The bridge sections are transported by Common Bridge

Transporters providing enhanced mobility for site selection. Each MRBC will have the capability of 210 meters of bridging. The system is external airlift/transportable by CH-47 and CH-53 helicopters. The bridge bays are air transportable, partially disassembled, in C-130s. The IRB has enhanced capabilities of: current speeds up to 10.3 feet per second, 2.1 meter bank access, 4.5 meter roadway width, improved hydrostatic capabilities, and various other design improvements.



Program Status. A five-year, multi-year contract awarded in FY00 provides for 13 of 20 MRBCs with the IRB. Four units were fielded in FY03, with the remaining nine units being fielded with the IRB in FY04-05.

Rapidly Emplaced Bridge System (REBS)

Description. The REBS provides a bridge with a four-meter roadway width, MLC 30 Tracked (T) and Wheeled (W) Normal and MLC 40(T)(W) Caution crossings across 13-meter gaps for the SBCTs. Transported on a common bridge transporter (CBT), each SBCT

will have 4 REBS. This system is transportable by CH-47 and CH-53 helicopters and C-130 aircraft. Two Soldiers can deploy the REBS in the daytime within 10 minutes with little or no site preparation.

Program Status. A five-year, multi-year contract was awarded in FY01 for 18 systems with an option for 22 systems. FUE is scheduled for 4QFY04.

Dry Support Bridge (DSB)

Description. The DSB is a modular bridge that can span a 40-meter gap in 90 minutes with eight Soldiers. It significantly reduces the manpower and time needed to construct a tactical bridge when compared to current systems, and possesses greater load capability. One bridge set provides either a 40-meter bridge or two 20-meter bridges. The bridge will cross MLC 96W/70T traffic and will allow the crossing of a heavy-equipment transporter carrying an M1A1 MBT. One system includes a launcher permanently mounted on a Palletized Load System (PLS), three CBTs and three PLS trailers which carry the modular components as palletized loads. A bridge set consists of six M1077 flat-rack loads of bridge components, one M1077 flat-rack load of launch beams, and a launcher vehicle.

Program Status. A multi-year contract awarded in FY00 provides 15 of 20 MRBCs

the DSB. Fielding initiated in FY03 will continue at about two MRBCs per year for systems funded.

Sustainment Capabilities

Army forces must be sustainable across the spectrum of conflict. Sustainability requirements reflect the continuous, uninterrupted provision of combat service support to Army forces. A full-spectrum Army will require a combat service support reach capability that allows commanders to reduce stockpiles in theater while relying on technology to provide sustained velocity management and real-time tracking of supplies and equipment.

Leveraging information technology and innovative concepts to develop an interoperable, joint C4 and ISR architecture is also critical to development of a joint operational picture that includes logistics information. Future Force units will "see first" by identifying current status of equipment readiness and sustainment requirements and the flow of logistics to enhance combat power.

The Current Force has employed advanced technologies coupled with a ubiquitous array of networked ground, air, and space sensors to provide the commander an unprecedented logistics operating picture. Sensors (RF tags and interrogators) coupled with the Movement Tracking System (MTS) have enabled a clear picture of the movement of supplies to the warfighter.

Future data fusion and systems, like the Joint Global Information Grid (GIG), coupled with innovative leader training, will enable logistic decision makers to view a synthesized, common operational picture (COP) of sustainment requirements. This COP will provide near real-time status and locations of inventories to effect combat power. This will enable the commander to develop and evaluate effective offensive and defensive courses of action in line with logistical parameters.

The COP produced by seeing first will allow leaders of the Joint Force to understand current logistics postures and supplies and the ability to respond to known requirements. Leaders at all levels—strategic, operational and tactical—will observe the COP and simultaneously analyze and share assessments through a collaborative planning process enabled by information technologies.

Future Force commanders will be able to leverage this information to enhance collaborative planning, reduce the decision cycle and seize the initiative, and build combat power prior to, during and after operations.

The BCS3 embedded within the Army Battle Command System (ABCS), and the C4 and ISR enhancements will improve the connectivity and network between tactical, operational and strategic units and provide a logistical COP to all commanders. ABCS is interoperable with both joint and multinational systems and leverages theater assets, like JSTARS.

Discussion of Key Sustainment Materiel Programs

Transportation Coordinators' Automated Information for Movement System II (TC-AIMS II).

Description. TC-AIMS II is a Logistics Transformation enabler that establishes the baseline for the deployment infrastructure needed to meet Future Force deployment objectives. The Army is the lead for the development of this joint system, which addresses critical shortfalls in the movement of materiel and personnel in support of DOD operations and the Joint Deployment Process.

CJCSI 3020.01 directed the Services to field TC-AIMS II to their early deploying units by the end of FY03. TC-AIMS II merges the best business practices of the current Service-unique transportation automated information systems into a single system that combines the requirements for Unit Movement, Installation Transportation Office/Transportation Management Office, and Theater Distribution functional areas as well as integrating several legacy systems of each of the four Services. TC-AIMS II improves joint capabilities for rapid worldwide deployment, and redeployment, and enables individual units the autonomous capability to conduct rapid crisis response at UA level. Each battalion and separate company will be trained on TC-AIMS II and provided with a complete suite of computer hardware.

Program Status. The TC-AIMS II program has been segmented into five blocks of requirements that support a spiral software development strategy. TC-AIMS II Block I was fielded to USAREUR, fielding continues to the Army and the USN to achieve a Full Operational Capability (FOC) in all Services by FY09.

Movement Tracking System (MTS)

Description. MTS is a critical logistics transformation enabler. It provides continuous combat support/combat service support (CS/CSS) asset visibility and situational awareness for the Joint Logistics Corporate Enterprise, enables Distribution-Based Logistics, and is a key step in achieving the sense and respond capabilities required to support network-centric warfare operations. MTS assists CS/CSS unit commanders in planning and executing operations with the capability to identify and track positions, monitor progress and communicate with tactical wheeled vehicles supporting CS/CSS operations within the tactical area. MTS is a satellite-based tracking/communications system consisting of mobile units, transceivers, control stations, a global positioning system, common operating software and MTS unique software.

Program Status. MTS is being procured in blocks. MTS Block I is in full rate production under a full materiel release. Fielding began with III Corps in FY01 and continues with priority fielding to OIF deploying units that are supporting Coalition Forces Land Component Command (CFLCC) efforts.

Battle Command Sustainment Support System (BCS3) *(previously the Combat Service Support Control System (CSSCS))*

Description. The BCS3 is a decision support system embedded within the overall Army's Battle Command System (ABCS) that assists commanders and their staffs in planning and executing CSS operations and is key to building and sustaining combat power in a continuous operational environment over extended distances. BCS3 will rapidly collect, store, analyze and disseminate critical logistics, medical, and personnel information. BCS3 is the CSS component of the Army Battle Command System (ABCS), as well as a key logistic enabler in the Army's transformation efforts and will be interoperable with GCSS Army. BCS3 is comprised of computer units, common operating software and unique

software. BCS3 is deployable in a tabletop configuration, with or without storage/transit cases, and in Standardized Integrated Command Post Systems (SICPS) configurations.

Program Status. BCS3 is in full production. Fielding began with III Corps in FY96 and continues to III Corps and the SBCTs through 2008.

Global Combat Service Support (GCSS) Army

Description. GCSS Army is the Army's primary enabler for CSS transformation. It supports the functions of manning, arming, fixing, fueling, moving and sustaining Soldiers and their systems. GCSS Army will be integrated with the Logistics Modernization Program (LMP) at the national level to provide a seamless enterprise-wide logistics environment that spans from the factory to the foxhole, fully integrated with emerging Joint Battle Command architectures. Both LMP and GCSS Army feature centralized total asset visibility, distribution-based supply, enterprise-wide maintenance data, and near real-time logistics readiness information. Improved software will achieve CSS integration that is currently lacking in the Army's present business systems/processes. Most importantly, the modernization is targeted to improve business operations up and down the supply chain while providing the capabilities to meet Future Force CSS objectives.

Program Status. The LMP is well underway and due for completion in FY04. GCSS Army commenced in 4QFY03 with implementation in FY07 through FY09.

Combat Service Support Automated Information System Interface (CAISI)

Description. The Combat Service Support Automated Information System Interface (CAISI) was developed to provide CSS Standard Army Management Information Systems (STAMIS) with an automated access to battle command systems and networks. CAISI uses off-the-shelf technology to enable this capability.

Program Status. CAISI is currently being fielded to SBCTs and is being selectively fielded to other forward-deployed ABCS-equipped units.

Authorized Stockage List Mobility System (ASLMS)

Description. With the potential to become the "Army Standard Logistics Mobility System," the ASLMS provides seamless garrison-to-field modularized storage for authorized stockage list repair parts. This Modular Storage and Transportation (MS&T) container is a durable, fully mobile repair parts container that is compatible with the Army's Load Handling System and Palletized Load System. The ASLMS will reduce the logistics footprint by up to 60 percent by replacing ten tractor/trailer (or

acquisition, life support, sustainment, illumination, etc. These functions are critical to mission accomplishment across the entire spectrum of military operations.

van) systems with four tractors pulling up to eight ASLMS 20-foot containers. The ASLMS contains a multitude of modularized storage bins and cabinets for parts storage and supports uploaded automation capabilities. Deployable by C-130 aircraft, it provides deployment planners more deployment options. Future models of the ASLMS will provide Class IV (barrier and construction materiel), Class V (ammunition), and other class containerization.

Program Status. The ASLMS ORD has been approved. Initial production and technical testing has been completed, and the Production Qualification Testing (PQT) is being conducted at Aberdeen Test Center. The FUE is scheduled for 4QFY04.

Tactical Electric Power (TEP)

Description. TEP is all mobile, engine-driven, electric power generating sources, 750-kilowatt (kW) and smaller, which are skid-mounted, wheel-mounted, or man-portable and are capable of independently producing electric power when operating on diesel, gasoline, or other fuel sources. Included are follow-on power sources, such as fuel cells and thermoelectric devices. These mobile, tactical generators provide quality power to operate DOD systems away from a fixed power grid and are found in nearly every organization in the Army. Generators directly support all field electrical systems, i.e., command, control, computer, communication, intelligence, surveillance and reconnaissance (C4ISR), medical, maintenance, fire direction and controls, target

Program Status. TEP Tactical Quiet Generators (TQGs) are currently in production and fielding. The next generation of TEP generators, the Advanced Medium Mobile Power Sources (AMMPS) reached Milestone B in Nov 03 and begins production in FY08. To date, half of the older MIL-STD generators have been replaced by TQGs and over 30,000 remain to be replaced by TQGs and/or AMMPS.

Standard Automotive Tool Set (SATS)

Description: Modular, flexible, and standardized, SATS replaces multiple field level shop sets with a single, consolidated base tool set augmented with packages that are tailorable to unit mission requirements and organizational design. SATS consists of a set of professional-grade tools with lifetime warranties, physical security, protection from the elements, and rapid tool identification for improved accountability and inventory as well as deployability. The design and storage method of SATS facilitate rapid inventory and enable the operator to verify within two hours or less that all items are present and secured in their designated storage locations. The most significant advantage gained through use of SATS is its impact on the logistics footprint; through standardization and modernization, SATS reduces the tool load weight by 18,000 pounds in the Forward Maintenance Company (FMC) of the SBCT, eliminating the need for four tactical wheeled vehicles and trailers. The same tool weight savings is realized in both the Forward Support Company (FSC) and Brigade Support Company (BSC) in the Force

XXI Division design along with a reduction of five tactical wheeled vehicles and trailers in each company.

Program Status. SATS are in full production with FUE scheduled in FY04.

Family of Medium Tactical Vehicles (FMTV)

Description. The FMTV is built around a common chassis and drive train, featuring over 80 percent commonality of parts and components between models and weight classes. Operating worldwide in all weather and terrain conditions, the FMTV provides unit mobility, resupply, and transportation at all organizational levels. It serves as the weapon system platform for HIMARS and the support vehicle for Patriot. FMTV enhances crew survivability through the use of hardened cabs, three-point seat belts, central tire inflation, and machine gun ring mount capability. It provides enhanced tactical mobility and is strategically deployable in C-5, C-17, C-130, and C-141 aircraft. FMTV reduces the Army's logistics footprint by providing commonality of parts and components, reducing maintenance downtime, and lowering operation and support costs that older trucks require.

Program Status. FMTV is in full production with over 18,500 trucks and 1,450 trailers fielded as of Oct 03. A competitive multi-year contract was awarded in Apr 03 to the current producer, Stewart and Stevenson, adding new models that include an expansible van, 10-ton dump, and 8.8-ton Load Handling System (LHS) truck and companion trailer compatible with flat racks, Container Roll-in/Out Platform (CROPs), and International Standardization Organization (ISO) shelters/containers. The HIMARS launcher chassis production build began in Oct 03.

High Mobility Multi-Purpose Wheeled Vehicle (HMMWV)

Description. The HMMWV is a light, highly mobile, diesel-powered, four-wheel-drive vehicle that uses a common chassis. Using common components and kits, it can be configured as a troop carrier, armament carrier, shelter carrier, ambulance, and TOW missile carrier. It is a tri-Service program that also provides vehicles that satisfy USMC and USAF requirements. The Up-Armored HMMWV is a key asset in the ongoing security and stabilization operations in OEF and OIF with its increased ballistic (up to 7.62mm NATO AP) and blast protection (12 lb. mine, front; 4 lb. mine, rear).

Program Status. In full production since FY85, current full production includes the HMMWV A2, Expanded Capacity Vehicle (M1113), and the Up-Armored variants (M1114). HMMWVs are being fielded to MP units (M1114), Data Interchange Customers (M1097A2/M1113), SBCTs, and other select units.

Heavy Expanded Mobility Tactical Truck (HEMTT)

Description. The HEMTT family of vehicles provides all weather, rapidly deployable transport capabilities for re-supply of combat vehicles and weapons systems. There are six basic configurations of the HEMTT series trucks: M977 cargo truck with Material Handling Crane (MHC), M978 2500 gallon fuel tanker, M984 wrecker, M983 tractor, the M11120 HEMTT-Load Handling Systems and M985 cargo truck with MHC. A self-recovery winch is also available on certain models. HEMTT-LHS provides the soldier with an efficient and economic system with capabilities that cannot be replicated in the light and medium truck fleets. The HEMTT family of vehicles is designated as a FCS complementary system and is a key enabler to achieving a distribution-based logistics system.

Program Status. All variants of the HEMTT are currently in production. The FY04-FY09 fielding schedule includes SBCTs 4-6, Army National Guard Division Redesign Units, and Air Defense units (Patriot and THADD).

Palletized Load System (PLS)

Description. The PLS is composed of a prime mover truck with integral self-loading and unloading transport capability, a 16.5-ton payload trailer, and demountable cargo beds (flat racks). The vehicle can also be equipped with materiel handling equipment and/or a winch. PLS is a key transportation component of the ammunition distribution system and provides long range hauling, local hauling and unit resupply of ammunition. The PLS is capable of transporting multiple configurations of cargo utilizing a variety of flat racks. The M1077 and M1077A1 are sideless flat racks used to transport pallets of ammunition and other classes of supplies. The M1 flat rack carries identical classes of supplies. It is ISO/CSC certified and is suitable for inter-modal transport, including transport on container ships. Ammunition can be loaded on the M1 at depots, transported via container ship to theater, picked up by the PLS truck and carried forward without the use of any material handling equipment. The PLS provides the Soldier with an efficient and economic system with capabilities similar to that of HEMTT-LHS and is a major enabler in the Army's drive to achieve a distribution-based logistics system.

Program Status: The PLS is currently in production. The FY04-FY09 fielding schedule includes AC and RC Engineer Mission Modules, Army Prepositioned Stocks (APS) and OIF combat loss replacements.

Rapid Manufacturing System (RMS)

Description. The RMS is a mobile compact communications and manufacturing system designed for deployment to remote locations for emergency fabrication of repair parts for

non-operational equipment. A combination of advanced technologies enables the RMS to quickly and efficiently produce repair parts on demand. The RMS retrieves manufacturing data via satellite from an extensive engineering and manufacturing database. In the event data for a part is not available or a communications failure, the RMS is capable of gathering its own geometric data through the use of a 3-D laser scanning system.

Program Status. A prototype RMS has been developed and is currently in use in the operational theater. This rapid manufacturing technology will be spread across many areas of the military, and eventually into other fields such as medical, for the production of prosthetics, as an example.

Forward Repair System (FRS)

Description. The FRS is a high-mobility, forward maintenance system that reduces Repair Cycle time. The FRS places in one package proven tools; test equipment and heavy lift capability to support forces in the forward battle area. The FRS includes the prime movers as well as a maintenance enclosure with 35kW generator, crane, welding equipment, industrial quality power air and hand tools, air compressor, tool cabinets and accepts as a host platform FBCB2 and MTS connectivity. The FRS meets the maneuver commander's need for the repair system that is responsive, effective and reduces the number of systems requiring evacuation.

Program Status. The FRS is in production and fielding. The first units being fielded are III Corps and the SBCTs.

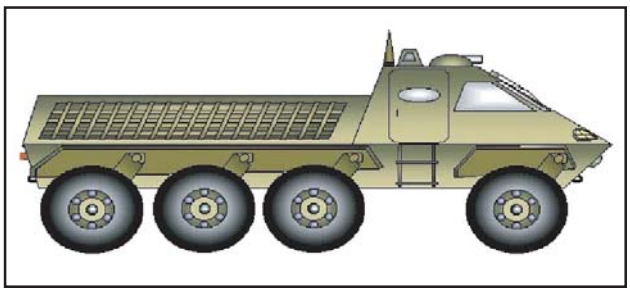
Lightweight Water Purifier (LWP)

Description. The LWP is a small, self-contained, highly transportable water purification system capable of producing 125 GPH of potable water from a freshwater source and 75 GPH from a saltwater source. The LWP will be capable of dispensing potable water at a minimum rate of 10 gallons per minute. The LWP will also be capable of being transported in a M1097A truck (HMMWV), sling loaded using a UH-60 Black Hawk helicopter and airdropped by fixed-wing aircraft, to include the C-130. The LWP provides the capability to purify water as far forward as possible, reducing the need to transport purified water forward. Special Operations Forces (SOF) detachments, medical detachments, and other small units will use the LWP when operating in locations that are isolated from standard water support. It may also be used in civil affairs and disaster relief operations. The LWP will sustain the daily consumption and personal hygiene water needs for populations of 70 to 225 people.

Program Status. The LWP Milestone C (full rate production) decision is in Feb 04. Seven systems have been produced with the FUE scheduled for 3QFY04.

Future Tactical Truck System (FTTS)

Description. The FTTS is envisioned as the Army's next generation tactical wheeled vehicle that provides direct support to Future Force units in terms of command and control capability and transportation and distribution of cargo, equipment, and personnel. The FTTS-Maneuver Sustainment Vehicle could possibly replace the PLS, HEMTT, and selected FMTVs. The FTTS-Utility Vehicle may replace the HMMWV. The FTTS will have improved range, cross-country capability, reliability, ballistic protection, and integral cargo transport capability over current vehicles. Both FTTS vehicles will have companion trailers. The FTTS objective is to have as much commonality with FCS as possible to achieve the reduction in logistics footprint required for the Future Force. This critical logistics transformation enabler provides commonality of platforms, helps reduce the sustainment footprint, and helps achieve full Distribution-Based Logistics. The Army is in the process of conducting mission analysis and refining the capabilities documentation for this system.



Program Status. The Army has developed a joint FY05 ACTD concept for the FTTS that includes using FTTS maneuver and sustainment vehicle "like systems" and two FTTS Utility Vehicle "like systems" within an SBCT in a side-by-side demonstration with currently fielded vehicles. The purpose of the ACTD is to develop insights for technology that can be inserted into current and future fleets.

Unit Water Pod System (CAMEL)

Description. The CAMEL system consists of a minimum of 900-gallon storage capacity, a heater/chiller unit, government-furnished M1095 (5-ton) medium tactical vehicle (MTV) trailer, and contractor-developed components mounted to or carried by the trailer. It will provide a maneuver company operating in a temperate environment 2+ days of supply (DOS) of water at a minimum sustaining consumption rate. It will have provisions for at least six retail dispensing points, and fully capable of stand-alone operation. CAMEL will be capable of transporting both full and partial loads of water, in accordance with approved standards, by C-130 and larger aircraft, external lift helicopter, and low-velocity air droppable. CAMEL replaces the M107, M149, and M1112 series water trailers.

Program Status. CAMEL entered the SDD phase with contract award in 4QFY03. Milestone C decision is scheduled for 3QFY05.

Load Handling System (LHS) Compatible Water Tank Rack System (Hippo)

Description. The Hippo consists of a 2000-gallon ISO framed potable water tank rack that

will be compatible with the Palletized Load System (PLS), the HEMTT-LHS and the FTTS Maneuver Sustainment Vehicle (MSV). The Hippo has an organic 125 GPM water pump, filling stand, 70-foot hose reel for both bulk suction and discharge and retail distribution. The Hippo will enhance water distribution by providing one system that enables both hardwall bulk water transportation and unit retail water support. It will allow for water transport directly from water purification points to supported maneuver elements and can be used as a water distribution point.

Program Status. In Sep 02, the Hippo received Milestone C approval to purchase five low rate initial production units for testing. First Article Testing is ongoing at Aberdeen Proving Ground with expected completion in Apr 04.

Load Handling System Modular Fuel Farm (LMFF)

Description. The LMFF provides the ability to rapidly establish a fuel distribution and storage capability at any location regardless of the availability of construction equipment or material handling equipment. The LMFF consists of a 2,500-gallon ISO framed fuel tank racks and 400 GPM ISO framed pumping modules. The pumping module will have a pump, engine, fuel/water separator, control panel, and hoses, nozzles, and other support equipment. The 35,000-gallon capacity LMFF consists of 14 tank racks and two pumping modules. The 45,000-gallon capacity LMFF consists of 18 tank racks and two pumping modules. The LMFF is compatible with the PLS, the HEMTT-LHS and the FTTS MSV, allowing these systems to recover the tank racks and pumping modules, transport them to the new location, and emplace the system.

Program Status. The LMFF ORD was approved in Mar 02. A Milestone C decision is scheduled for FY04 with SBCT fielding scheduled for FY06.

Rough Terrain Container Handler (RTCH)

Description. The RTCH is the primary Material Handling Equipment capable of lifting standard 20- and 40-foot long ISO containers weighing up to 53,000 pounds. The RTCH can be operated on beaches, rough terrain, and unimproved surfaces. The system is air-deployable and can be used to lift containers and prepositioned PLS flat racks, break-bulk cargo, and heavy palletized Class V loads (RTCH equipped with the forklift attachment).

Program Status. The RTCH is in full production. Fielding began in Jul 01 to the 21st Cargo Transfer Company (CTC) in Ft Lewis to support the first SBCT. Since this initial fielding, a total of 277 vehicles have been delivered to mostly CTC units. This figure also includes 2 vehicles for the Australian Army and 22 vehicles for the United Kingdom Ministry of Defense under two separate FMS cases. Over 100 vehicles have been deployed in support of OEF/OIF.

Maintenance Support Device (MSD)

Description. Formerly the Soldier Portable On-System Repair Tool (SPORT), the MSD is a lightweight, rugged, portable tester employed at all levels of maintenance. It is the Army's

standard system tester used to automatically diagnose weapon system operations, both electronic and automotive, and identify faulty components for immediate replacement. The MSD and its predecessor, the SPORT, are in wide use throughout the Army's ground combat and CSS vehicle fleets as well as in the Army aviation fleet.

Program Status. The MSD is currently in full rate production and fielding. A recent change in the basis of issue will provide the MSD to organizational level maintainers at a ratio of 1:3 per maintainer military occupational specialty (MOS).

Medical Communications for Combat Casualty Care (MC4) System

Description. The MC4 system is a theater, automated Combat Health Support (CHS) system that links commanders, health care providers, and medical support providers at all echelons with seamless, integrated medical information. It will receive, store, process, transmit, and report medical C2, medical surveillance, casualty movement/tracking, medical treatment, medical situational awareness, and medical logistics data across all levels of care. The MC4 system is fully operational with standard Army systems and operates on standard commercial hardware. The MC4 system is a joint system compatible with and supportive of all the Armed Services, provides joint software. The MC4 system supports the commander with a streamlined personnel deployment system using digital medical information.

Program Status. MC4 has an approved ORD. The program is currently scheduled for a Milestone C decision in 1QFY04 and a full rate production decision in 3QFY04.

Force Provider (FP)

Description. FP is a high-quality deployable base camp designed to support the Combatant Commanders' needs in remote areas of the world. It provides in one package: billeting, food service, showers, latrines, laundry, and recreational support services. Each system consists of one stand-alone module that will support 550 personnel plus 50 operators. In addition, three modification systems exist to improve FP capabilities: a Cold Weather Kit for operations at –15º F, a Prime Power Connection Kit that connects to a Power Generation Kit consisting of 24 each 60kW Tactical Quiet Generators (TQG).

Program Status. The initial AAO of 36 FP modules has been fielded and is currently supporting OEF/OIF. The Army is now addressing additional AAO and new requirements given emerging operational needs and the use of FP as long-term base camps. Improvements are being developed to reduce the FP logistical support requirements, shipping cube, set up time and module cost. These efforts will be implemented during Reset and with any additional module purchases.

Focused Logistics (FL) Summary

Sustainment of forces, in any environment, is critical to successful mission accomplishment. This appendix focused on the lift-equipment, modernization programs for assured mobility and sustainment systems. More important than

materiel programs, however, is the entire redesign of the Army's force to a Future Force design and the accompanying Logistics Transformation effort addressed in the main body of this *2004 Army Modernization Plan*. This new design will greatly enhance the Army's ability to rapidly deploy and successfully carry out missions across the full spectrum of operations.

As the Army continues to transform itself into a Future Force design, the specific requirements needed to enhance mobility and sustainability will become clearer. The current plan funds those programs with proven potential for the Future Force while enhancing the capabilities and readiness of the Current Force.

Appendix 4: Battlespace Awareness (BA)

Battlespace Awareness (BA) is the ability to sense and understand the operational environment with its mix of friendly "blue" forces, enemy "red" forces, and "gray" non-aligned actors/noncombatants as well as terrain and weather aspects that can aid or hinder friendly force operations. BA relies upon the continuous collection, processing, analysis and modeling of data from a large mix of highly responsive sensors (e.g., unattended, human, intrusive and remote) to provide the commander and his force elements with near real-time, collaborated, tailored, actionable battlespace information. Enhancing BA capabilities provides the commander with more confidence in his understanding of the operational environment and the associated operational risks. This translates to better and faster decision making in the planning and execution of operations. BA is the key to increasing the reach, persistence, and agility of our military capabilities while increasing the range of military options available.

Observation and information collection occurs throughout the battlespace from traditional ISR sensors and collectors, such as satellite constellations, airborne and proximate sensors, and human intelligence (HUMINT), to nontraditional sites, such as commercial and open sources. Each of these entities represents a node in the BA grid. Nodes provide information to the grid and draw information as required from the grid. Nodes range from every Soldier in the field as a potential sensor to the future Space-Based Radar as a primary provider of an extremely fine-grained depiction of the battlespace. Through these nodes, intelligence on current and future activities in the operational environment and updated baseline environmental information is collected, fused, analyzed and presented to create a comprehensive battlespace picture. Baseline environmental data includes information on the weather, cloud cover, vertical temperature profile, humidity, wind, precipitation, soil moisture, ice cover, sea ice, electron density profile, vegetation, terrain, infrastructure, resources (e.g., water, energy sources, building materials), transient infrared sources, second order effects like trafficability, sensor field of view, as well as significant social aspects such as the cultural, economic, political and security situation. By utilizing the collection capability of all possible nodes, the reach, robustness and persistence of the entire sensing network are greatly enhanced to create a pervasive, detailed understanding of the battlespace.

One significant area of joint development that supports enhanced BA capabilities is space. Space is the backbone for the national and military ISR architecture and the domain of choice for commercial broad area sensing enterprises with military utility. Space-based communications provide reach and NLOS connectivity while space-based ISR and commercial imagery platforms substantially

enhance strategic, operational, and tactical intelligence collection, processing and dissemination. Soldiers in OEF and OIF use space-based systems to communicate, navigate, target, find and fix the enemy, anticipate weather, receive missile warning, avoid fratricide, and much more.

The Tactical Exploitation System (TES) embedded in the corps and division force structures is providing vital space-based imagery, SIGINT, Blue Force Tracking (BFT) and communications reach for OIF. The Army is currently developing the Distributed Common Ground System–Army (DCGS-A), as part of the DOD DCGS concept, to incorporate ISR data and information from all sensors and Analytic Centers regardless of the source across the JIM force to provide the red and gray portions of the COP to commanders and decision-makers down to the individual Soldier.

The shared visibility between operations and intelligence provides the venue to predict the effects of threat actions and changes in the operational environment as well as assess potential courses of actions against the threat operations. Decision making and forecasting tools will continuously evaluate changes in environmental data to identify potential impacts on ongoing operations and alert the relevant decision authority to the perturbation. Predictive analysis and modeling will allow potential courses of action to be evaluated with a better understanding of the potential impacts on the operational environment. The simultaneous current and forecasted depictions of the battlespace coupled with the responsiveness of sensors will allow commanders to quickly evaluate sensor mission utility and re-task multiple sensors to react to emerging operational situations.

Current and projected operational information will be continuously fused by robust knowledge management systems, and will be disseminated to all levels of users through adaptable, flexible, networked communication systems. Within this "producer interactive network," force elements will subscribe to products or data (including archival data). Software agents will broker data and products, posting some unprocessed information. In this manner, all joint, allied, and coalition warfighters will have access to common data to construct their own tailorable, relevant operational pictures.

Below is a brief discussion of some of the key materiel programs supporting BA capabilities.

Discussion of Key Battlespace Awareness Materiel Programs

Distributed Common Ground System–Army (DCGS-A)

Description. DCGS-A is a family of systems and an integral component of the Army's ISR networking strategy. DCGS-A will migrate capabilities of disparate ISR systems into a joint common and interoperable multi-intelligence architecture to improve the ground commander's ability to act faster than the enemy's decision cycle, or ability to react. DCGS-A software/hardware used throughout the Army and joint environment will task, post, process and use Army, joint, national, interagency, and multinational ISR sensor data and information in support of Future Force, Joint Task Force and multinational operations. DCGS-A is an FCS complementary system, providing capabilities required for the UA to achieve IOC. Fixed and Mobile DCGS-A transparently operate with embedded DCGS-A software applications within the FCS, operating in a secure, collaborative, networked environment. DCGS-A provides real-time sensor-to-commander, sensor-to-shooter, and

sensor-to-analyst information tailored to mission, task, and purpose of the recipient.

Program Status. The DCGS-A program will employ an evolutionary acquisition strategy, providing incremental milestone decisions throughout the SDD phase based on validated/ approved requirements for DCGS-A capabilities and the DCGS-A capability needs inherent in other Future Force programs such as Aerial Common Sensor and Future Combat Systems. Milestone B decision is scheduled for 1QFY05 to field an objective capability by 2010. The 525th MI Brigade, XVIII Airborne Corps will demonstrate a DCGS-A Block 1 capability in FY04 and a multi-echelon DCGS-A capability will be fielded to the 504th MI Brigade, III Corps in FY05.

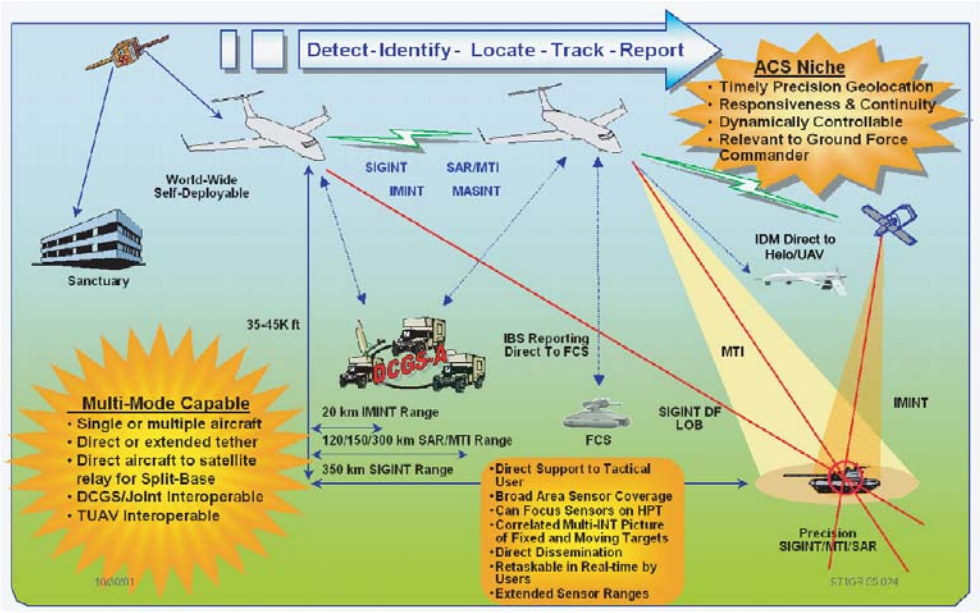
The All Source Analysis System (ASAS)

Description. ASAS provides accurate, clear, relevant, timely, and predictive automated actionable intelligence about the current enemy situation. ASAS sets the environment that the commander and his staff need to plan and execute battles, engagements, and other missions across the full spectrum of operations in both a structured and nonstructured threat environment. ASAS assists the commander in visualizing the battlespace, organizing his forces, and controlling operations to achieve the desired tactical objectives or end state. Inherent within ASAS is the capability to plan and direct ISR operations, produce relevant information and intelligence, and disseminate intelligence and other critical information in an understandable format to those who need it, when they need it.

Program Status. ASAS Block II is in SDD with several components in full rate production. The most significant of these is the ASAS Light, the Intelligence Staff Support Tool currently being fielded to the force. The ASAS Block II Analysis and Control Element (ACE) Light is a software component of DCGS and will be fielded with DCGS-A software upgrades. ASAS Block III development also will start in FY05 as it migrates to the DCGS-A program.

Aerial Common Sensor (ACS)

Description. ACS is the Army-led, joint airborne ISR system that meets the Army's and Navy's requirements for a worldwide, self-deployable asset that can begin operations immediately upon arrival into theater, in front of or along side the Future Force. ACS will be organic to the UA and will merge the capabilities of Guardrail Common Sensor and Airborne Reconnaissance-Low into a single multifunction platform to provide the requisite networked situational awareness and joint network-centric and deep strike precision targeting for the future JFC. ACS provides distributed, wide area, persistent surveillance throughout the breadth of the Joint Operations Area battlespace and multi-intelligence precision targeting. Using the DCGS for the ground station component, ACS, via robust sensor-to-shooter and reach links will provide commanders at every echelon the tailored, multi-sensor intelligence required for dominant maneuver, precision engagement, information superiority and decision dominance throughout a nonlinear framework and noncontiguous battlespace. Onboard battle command and communications relay packages will ensure



the technical fire control providing ballistic solutions for cannons and rockets. AFATDS is a true joint system, fully fielded by the USMC, on USN ships and interoperating with the USAF via the TBMCS. As such, AFATDS provides the capability to identify, track and respond to targets across the entire battlespace, using all fire assets available.

uninterrupted, joint integrated C4I. Through a modular, open architecture, onboard COMINT, ELINT, IMINT and MASINT sensors, incorporating electro-optical (EO), infrared (IR), Synthetic Aperture Radar (SAR), Moving Target Indicator (MTI), multi- and hyperspectral imagery sensors, as well as onboard operators, will ensure sensor/processing technology enhancements maintain pace with evolving threats via software vice hardware solutions.

Program Status. ACS is in the early stages of the SDD phase, with a Milestone C decision scheduled for 4QFY08. FUE will be an aerieal exploitation battalion in FY10, with four additional systems fielded at a rate of one every two years.

Advanced Field Artillery Tactical Data System (AFATDS)

Description. AFATDS is the primary fire support system at division and below providing tactical fire solutions, including weapon-target pairing, mission planning and execution. AFATDS provides the fires common operational picture at each echelon, as well as AFATDS also operates at echelon above division levels, providing a strategic and operational picture of the battlefield to meet the commander's top seven priorities. AFATDS provides the picture of the location and status of all friendly fire support (FS) assets; enemy situation tracking all enemy target locations, and a running fire support logistics status (munitions; rounds; petroleum, oil and lubricants (POL)). AFATDS provides graphic control measures, maintaining a complete database of FS geometries and FSCMs and performing appropriate levels of coordination as required. The AFATDS FS target database and weapon status tracking feed the commander's Situation Report (SITREP). AFATDS management of the FSCM and capability overlays ensure optimal weapon target pairing and strategic attack analysis.

Program Status. AFATDS is currently fielded to seven USN ships, 100 percent of USMC FS units, over 95 percent of the AC Army FS units, and will be fielded to 70 percent of the ARNG FS units. Version 6.3.2 software will begin full material release in 2004. Future improvements will focus on increased joint interoperability, and new weapons and munitions utilization.

Long Range Advanced Scout Surveillance System (LRAS3)

Description. LRAS3 provides unmatched long-range target acquisition and far target location capabilities to armor and infantry scouts. It consists of Horizontal Technology Integration (HTI) 2GF (cooled IR), long-range optics, laser rangefinder, GPS interferometer, day video camera, and a link to FBCB2 for automated handoff of target locations. As the premier ground scout sensor system, it enables the scouts and cavalry units to conduct reconnaissance, surveillance, and target acquisition (RSTA) missions while remaining outside of threat acquisition and engagement ranges during all weather and dirty battlefield conditions (i.e., fog, dust, smoke, and sand). LRAS3 is also being integrated with a Laser Designator Module (LDM) as the Fire Support Sensor System (FS3) for the Stryker Fire Support Vehicles and the Knight Fire Support Vehicles (M707).

Program Status. LRAS3 is in full rate production and is funded to procure LRAS3 for AC heavy and light divisions. LRAS3 is being fielded to HMMWV-mounted scouts and is being integrated into the Stryker Reconnaissance Vehicles.

Tactical Exploitation System (TES)

Description. The Tactical Exploitation System (TES) is the Army's Tactical Exploitation of National Capabilities (TENCAP) system that receives, processes, exploits, and disseminates intelligence data from direct downlinks and other ground stations. The TES family of systems is a key part of the emerging DCGS architecture with TES variants in Army, USN, USMC and limited USAF units. The TES program combines the intelligence functions of four previous stovepiped ISR collection systems into an integrated downsized, open, scalable, modular and network-centric architecture with all elements fully transportable by C-130 aircraft. TES tasks, receives, processes and exploits Electronic Intelligence (ELINT), Communication Intelligence (COMINT) externals, Imagery Intelligence (IMINT) and Moving Target Indicator (MTI) data from selected national, theater, and tactical platform/sensors and generates timely information, intelligence and targeting data. The TES also is capable of limited MASINT processing and analysis. The TES receives space-based Blue Force Tracking data and provides it to the GCCS-A. The TES has a direct digital/network interface with the AFATDS and Artillery Deep Operations Coordination System (ADOCS). The TES performs the preprocessor functions for the All Source Analysis System (ASAS), Common Ground Station (CGS), and Digital Topographic Support System (DTSS). Designed for split-base operations, TES supports joint, combined and early-entry operations.

Program Status. TES-Main and TES-Forward systems have been fielded to 18th ABC, V Corps, III Corps and 513th MI Brigade. Distributed–TES (DTES-division level assets) will be fielded to all AC divisions by Nov 04. Reduced capability TES Forward systems will be fielded to the 501st MI Brigade and to I Corps in FY06. The FY03 TENCAP General Officer Steering Committee (GOSC) agreed to provide TES-FWD (-) to USFK. USFK will receive TES-FWD (-) in FY06. Twenty-one TES Light (TES-L) systems will be fielded to SOF, ACR, ROK Army and selected brigade level elements starting in FY05. A number of TES systems were deployed in OEF and OIF and judged in after-action reports as being very supportive of high OPTEMPO, ISR and dynamic targeting demands. TES systems were the primary interface for missile launch notifications within the corps and divisions. Although the draft DCGS-A roadmap contains TES-Forward

configuration items, DCGS-A will replace TES and reach its initial operational capability by FY09. DCGS-A provides TES and other Program of Record capabilities to the Future Force. Spiral development provides risk mitigation to the Current Force.

Integrated Meteorological System (IMETS)

Description. IMETS supports the Current Force including Aviation, SOF, and SBCTs. It will migrate through spiral development to DCGS-A in the Future Force in 2008. IMETS ingests local aviation surface weather and artillery upper observations, weather satellite data, and unattended, automated observing equipment. IMETS receives transmissions of centrally prepared Air Force forecast products. IMETS uses Army weather effects software linked to current and forecast data to determine weather effects on personnel, equipment, and operations. IMETS provides tailored weather forecasts and space weather impacts for planners and operations, including chemical defense. Weather effects are linked to users within each supported tactical operations center (TOC) by direct machine-to-machine interface, enabling users to interact with the database to determine details on the adverse weather effects. IMETS is the gateway and communications interface to support major subordinate commands and warfighters without direct weather support.

Program Status. IMETS is primarily a nondevelopmental item (NDI) which will have three separate, distinct configurations: the Vehicle Mounted, the Command Post (CP), and the Light. The Vehicle Mounted and Light configurations are in full rate production. The CP configuration is in the SDD phase, scheduled to undergo testing in FY05 and begin fielding in FY07.

Prophet

Description. Prophet provides a near real-time view of the brigade/ACR/ SBCT area of operations through the use of COMINT sensors and includes the capability to detect, identify, and electronically attack select enemy emitters. It is a dedicated, dynamically retaskable asset, allowing the tactical commander to visually depict and understand his battlespace, now and in the future. It provides expanded frequency and area coverage for situational development, awareness and force protection operations. Prophet can operate on the move mounted on a HMMWV or stationary in a mounted or dismounted configuration. It has an open architecture that supports programmed improvements and mission specific technical insertion components. This makes Prophet relevant throughout the entire spectrum of operations. According to the Commanding General, 101st Airborne Division, the Prophet has been an invaluable and critical collection asset, answering his priority intelligence requirements in OIF.

Program Status. Prophet Block I passed IOT&E in Dec 00 and began full rate production in Dec 01 with initial fielding in Nov 02. Prophet Block I was fielded to support deploying forces in support of OIF. Prophet Blocks II/III went into the SDD phase in Mar 03. IOT&E is scheduled for 4QFY04 with FUE in 4QFY05.

Tactical Unmanned Aerial Vehicle (TUAV)

Description. The RQ-7A Shadow 200 TUAV provides the maneuver commander with a near real-time, highly accurate, sustainable capability for over-the-horizon Reconnaissance, Surveillance, Target Acquisition (RSTA), and Battle Damage Assessment (BDA). Each Shadow 200 TUAV system consists of four Shadow 200 air vehicles, six HMMWVs, two Ground Control Stations (GCS), one portable GCS, and four remote video terminals that can provide near real-time videos to commanders on the ground.

The Shadow 200 TUAV currently has an onboard EO/IR sensor payload. Objective payloads may include but are not limited to advanced EO/IR, all-weather synthetic aperture radar (SAR) and moving target indicator (MTI), and signals intelligence (SIGINT) sensors. The threshold range is 50 km with an objective range of 200 km and an on-station endurance of four hours. The threshold payload is 60 pounds with an objective capacity of 100 pounds. OPTEMPO requires a threshold of 12 sorties per 24 hours and an objective of 18 sorties per 24 hours.

Program Status. TUAV IOT&E was completed in May 02 followed by a Milestone III full rate production decision in Sep 02. FUE was 3/2 IN SBCT in May 02 and IOC was achieved in Oct 02. Production and fielding to the remaining five SBCTs continues under the FY05-09 program plan. The TUAV is currently in use in OIF. Figure D-9 depicts the fielding schedules for both the Shadow TUAV and ACS, both critical battlespace awareness sensors.

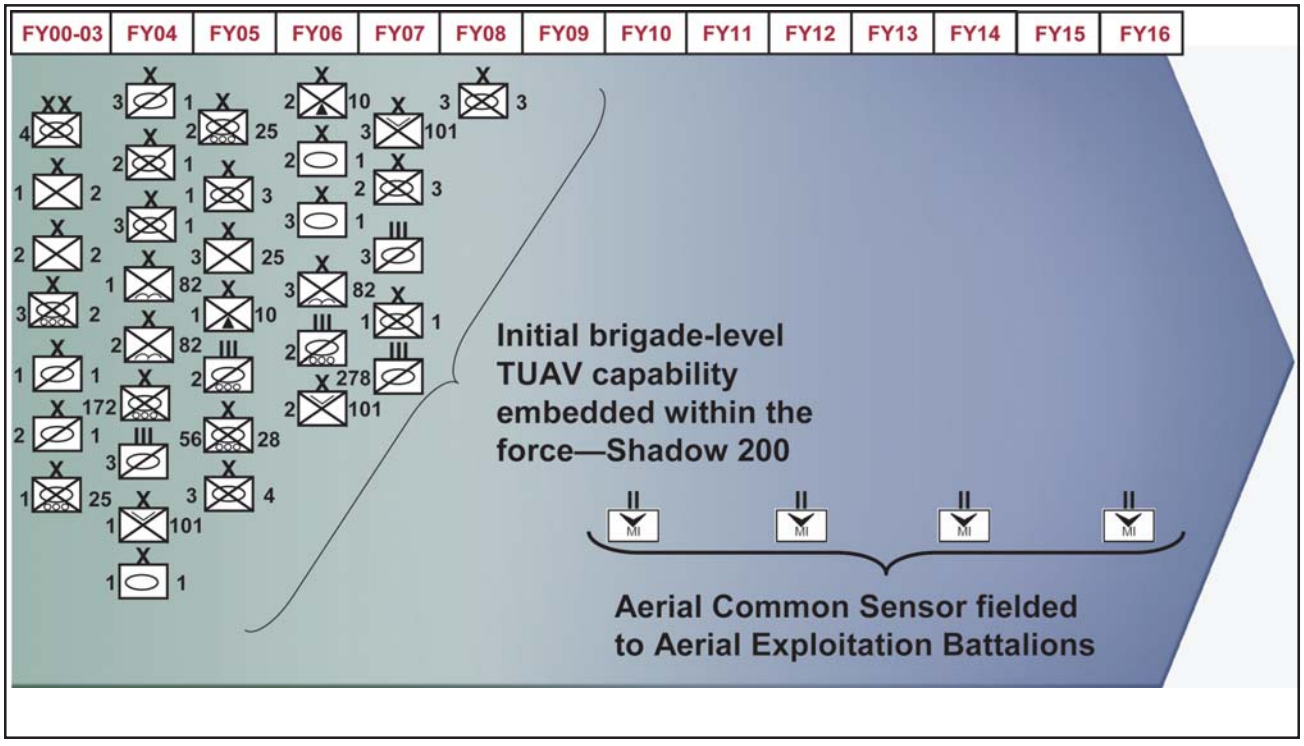


Figure D-9. Critical Sensors Fielding Schedule

Phoenix Battlefield Sensor System (PBS2)

Description. Phoenix Sensor System replaces the aging AN/TPQ-37 artillery locating radar. The Phoenix system will be fielded to each of the SBCTs and as a one per one replacement for existing Q-37 requirements. It will be developed in blocks, the first leveraging technology from its predecessor. Phoenix Block II will incorporate technology developments from the Multi Mission Radar Science and Technology Objective (MMR STO). Technically, the Phoenix will have double the detection range of the current AN/TPQ-37 radar while improving accuracy and target throughput. Additionally, the Phoenix will provide a broad spectrum of target detection by providing mortar detection to 15 km, rocket detection to 150 km, and detection of missile launches out to 300 km.

Program Status. The program has started construction of the first SDD Block I systems with two systems expected by FY05. A Limited User Test (LUT) in FY05 will support a Milestone C (LRIP) decision in 4QFY05. LRIP and IOT&E are scheduled to begin in FY06 with a FUE in 1QFY08 and full rate production beginning that same year.

Battlespace Awareness (BA) Summary

BA supports and is supported by the other functional concepts. BA enables Joint C2, Force Application, and Force Protection to bring combat power to bear at critical points, avoid enemy denial and deception, break-through or circumvent anti-access and area-denial strategies, and thwart enemy attempts to harm U.S. interests worldwide.

BA capabilities strive to achieve superior situational understanding of the threat and battlespace, decision superiority using precision actionable intelligence to achieve desired effects rather than physical destruction alone, integration of multifunctional tactical and national intelligence sensors and sources, precision targeting and armed aerial reconnaissance, and denial of enemy access to friendly information.

Recent operations have shown the value of space-based, airborne, and ground C4 and ISR systems that are networked with manned ground systems to achieve Joint Force BA capabilities. The Army is developing organizations and fielding equipment to capitalize on this operational experience in today's Current Force as well as in the building of tomorrow's Future Force with future Joint Force BA capabilities.

Appendix 5: Command and Control (C2)

C2 is the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. To accomplish this effectively, the commander fuses battlespace information with information on force locations and capabilities, as well all other information relevant to mission planning, into a common operational picture. The commander develops alternative plans of action, selects a course of action and directs force employment exercising C2. This can be either a deliberate process, in preparation for a campaign or battle, or a hasty process in response to battlefield opportunities or challenges. Key elements of C2 are a decentralized, networked and collaborative communications and computer environment and the precision guidance and timing capabilities that collectively support accelerated decision-making processes throughout the Joint Force. The synergy of this collaborative environment with the COP allows subordinate commanders

to self-synchronize their activities, based on knowledge of the commander's intent and of the current situation in the battlespace, and to execute actions seamlessly, with minimal or no requirements for deconfliction or coordination.

Army Command and Control (Army C2) is a critical enabler for and a fully interoperable component of Joint Command and Control (JC2). Army C2 consists of Army Battle Command (cognitive and technical aspects) and the Army network component of the Global Information Grid (GIG). The joint concepts for JC2 and Army battle command concepts are complementary and commander-centric. Both are focused on achieving better situational understanding and decision dominance.

Battle Command

The Army views battle command, the art and science of applying military leadership and decision making, as the essential capability that enables the conduct of future joint operations. Enabled by C4 and ISR, battle command enhances the commander's ability to gain information and decision-making advantages over any adversary. Further, C4 and ISR networks within the GIG will provide an inherently joint, top-down network that provides common situational awareness to improve battle command. Battle command is an integration of BA and C2 capabilities.

Army Battle Command modernization efforts are designed to bridge the Current to the Future Force, enable network-centric warfare, and allow the operational and tactical commander to see first, understand first, act first, and finish decisively with unprecedented situational understanding and decision superiority.

One recent initiative to enhance Current Force capabilities is termed "Good Enough" Battle Command. This initiative reviewed current operational requirements in order to resource current Combatant Commander's needs with a baseline command post capability as a first step in bringing these capabilities to the Current Force. This capabilities-based baseline uses existing resources in the ABCS program to standardize software in 2004, ensure joint interoperability of essential capabilities, and distribute this capability across the Current Force by FY07. This initiative is part of an overall "Army Battle Command Way Ahead" strategy that develops a single standardized battle command system that incorporates operational lessons, the requirement for Joint Battle Management Command and Control (JBMC2), and emerging joint requirements.

The Network

Concepts for network-centric warfare, full-spectrum dominance, and decision superiority are driving C2 modernization efforts for the Army's Future Force and the Joint Force. These concepts require a robust, modular, deployable, and always capable network that provides universal access to all relevant authorities, assets, and capabilities. This network consists of integrated information systems, supporting information infrastructure, and a knowledge-based force of individuals located across the entire spectrum of the battlefield from the Soldier on point, through a variety of operations and support centers in theater, to home station operations and support centers located worldwide.

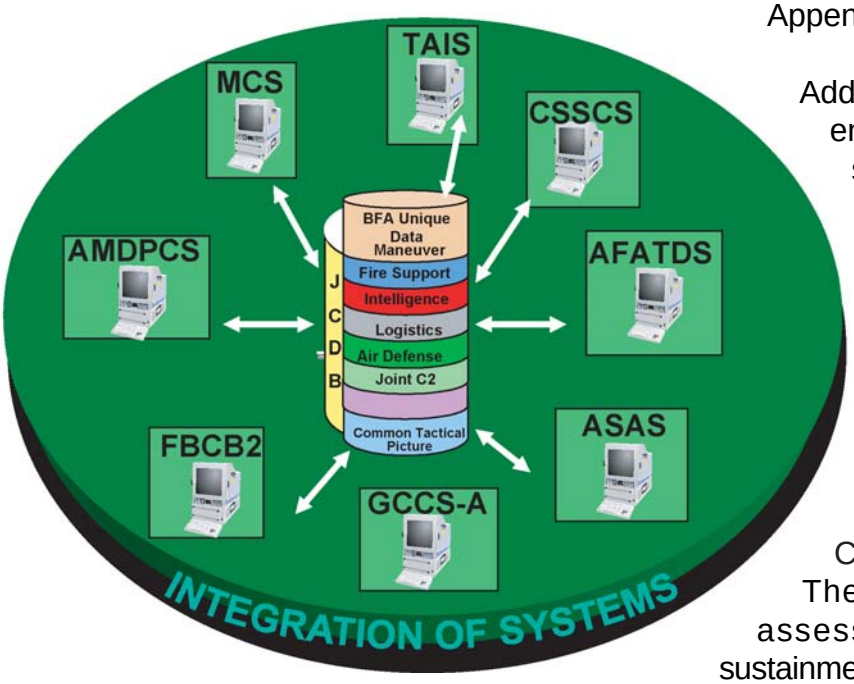
To achieve this level of networking, the focus is being shifted from a bottom-up to a top down approach that develops integrated C2 network architectures designed to support battle command capabilities for the Current and Future Forces in the JIM full-spectrum operational environment. The Army is currently identifying baseline network capabilities for the

JIM environment and will use a single Army lead for network development to enhance the Current Force and accelerate network development for the Future Force.

Below is a discussion of key Army C2 materiel programs that support JC2 and developing a COP.

Discussion of Key Command and Control Materiel Programs

Army Battle Command System (ABCS)



Description. ABCS is the Army's component of the Global Command and Control System (GCCS) and Combatant Commander Deployment C2. It is a complex system of systems that receive and transmit information among the Joint Force. ABCS consists of subsystem software that provides specific support for the Battlefield Functional Areas, including :

- Global Command and Control System–Army (GCCS-A)
- Maneuver Control System (MCS)
- Air and Missile Defense Command and Control System (AMDCCS)
- Force XXI Battle Command Brigade and Below (FBCB2)
- All Source Analysis System (ASAS), [described in Appendix 4, Battlespace Awareness]
- Advanced Field Artillery Tactical Data System (AFATDS), [described in Appendix 4, Battlespace Awareness]

Additionally, common software products enable information sharing with other systems and provide situational awareness of the battlefield to every echelon.

Program Status. An Army working group is reassessing ABCS distribution in the Current Force based upon lessons learned while providing support to the Coalition Forces Land Component Command (CFLCC), CENTCOM. The working groups are tasked to assess the current distribution and sustainment strategy to see what initiatives can take place in order to further promote ABCS interoperability across the Army.

Global Command and Control System–Army (GCCS-A)

Description. GCCS-A is a computer-based strategic command and control system that provides readiness reporting, mobilization, and deployment of AC and RC forces. It also provides detailed information on intra-theater planning and movement. GCCS-A is a seamless Army extension to the joint GCCS at

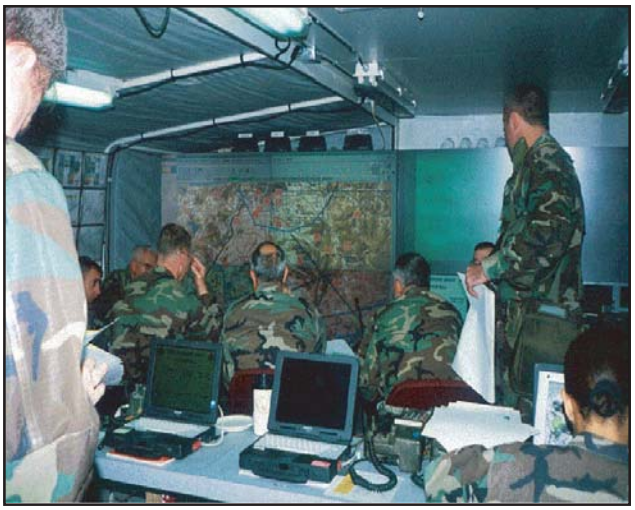
EAC level. GCCS uses a common open systems hardware architecture that has a combination of government and COTS hardware and software. The GCCS-A is an integral component of the Deployable Joint Command and Control System (DJC2), a networked system of information systems to facilitate JC2.

Program Status. GCCS-A is a fielded system within the ABCS. GCCS-A upgrades are based on operational needs and technical interoperability requirements with joint GCCS, DII COE and ABCS.

Maneuver Control System (MCS)

Description. MCS is an automated C2 system that provides a network of computer terminals to process combat information for battle staffs. It provides automated assistance in the collection, storage, review, and display of information to support the commander's decision process. Both text and map graphics are provided to the user.

Program Status. The Army is preparing a test strategy in accordance with the ABCS Way Ahead Strategy. The IOT&E for MCS is TBD based on a new Army test strategy.



Air and Missile Defense Command and Control System (AMDCCS)

Description. The AMDCCS provides both command and control and a sensor-to-shooter link for AMD operations. It consists of two components, the Forward Area Air Defense Command and Control (FAAD C2) and the Air and Missile Defense Planning and Control System (AMDPCS). AMDCCS fully automates C4 and ISR linkages, integrates AMD sensors, weapons and C3I, and interfaces with ABCS, GCCS and joint and allied C4I. It provides AMD elements and ADA Brigades with a fire control system via the Air Defense System Integrator for monitoring and controlling engagement operations by subordinate battalions. AMDCCS provides a common air and missile defense staff planning and battlespace situational awareness tool via the Air and Missile Defense Workstation (AMDWS), which presents airspace situational understanding to Army commands. This workstation also provides interoperability with Joint Theater Air and Missile Defense forces.

Program Status. FAADC2 is an ACAT II program in procurement with an Aug 95 approved ORD. AMDPCS is an ACAT III program in final development with a May 97 approved ORD currently under revision. The FY05-09 program plan funds both FAADC2

and AMDPCS to provide AMDCCS to all SBCTs and III Corps units through the fielding of the Air Defense and Airspace Management (ADAM) Cells.

Force XXI Battle Command Brigade and Below (FBCB2)

Description. FBCB2 is a joint interoperable, digital, battle command information system for brigade level and below. FBCB2 is designed to provide mounted and dismounted combat elements with near real-time, integrated situational awareness and C2 functionality. FBCB2 enhances the ability of tactical commanders to better synchronize their forces, achieve agility, and gain a "feel" of the battlespace through improved situational awareness and better combat awareness reporting, while on the move. FBCB2 is a key component of the ABCS. The FBCB2/BFT operates over both terrestrial communications networks and SATCOM networks; the system consists of a ruggedized computer with a touch screen and keyboard in which the Soldier sees either a digital map or satellite imagery overlaid with icons representing the vehicle's location, other FBCB2/BFT vehicles, known enemy units, and objects such as minefields and bridges. FBCB2/BFT was expeditiously fielded in reduced quantities to every MACOM as well as the USMC and UK Forces participating in OEF and OIF. As a result of lessons learned in OEF and OIF, the Army revised its Army Battle Command plan to deliver a consistent solution across the force within 18-24 months in order to provide partial "good enough" capabilities over time. FBCB2 requirements were refined to accelerate fielding efforts (OIF-like capability) to the entire Active Army and 15 eSBs by FY05. After initial fielding efforts are achieved (thin fielding), the rest of the Key Leader Option (KLO) distribution efforts to the entire Active Army and 15 eSBs will be accomplished by FY07.

Program Status. FBCB2 is currently funded to continue improvements in joint interoperability, including migration to JTRS and integration with future weapons systems. The Army will execute a Developmental/ Operational Test in 2QFY04 to satisfy the program's IOT&E requirement and subsequently proceed to full rate production in FY05.

Grenadier BRAT (GB) and Mini-Transmitter (MTX) Blue Force Tracking (BFT) Systems

Description. GB and MTX are BFT systems that take advantage of the existing national space infrastructure. They give commanders the ability to track and receive status reports, in near real-time, from friendly forces that require a Low Probability of Intercept/ Low Probability of Detection (LPI/ LPD) C2 link. GB and MTX systems substantially enhance security and reliability through the use of LPI/LPD COBRA

Grenadier BRAT

Mini Transmitter

(collection of broadcasts from remote assets) waveforms, NSA-certified encryption, and military GPS. A space-based BFT Mission Management Center (MMC) supports GB/MTX use of the existing COBRA architecture by coordinating with national system managers and warfighting units to help collect, process, and disseminate warfighter BFT data. During OEF and OIF, the GCCS successfully integrated disparate BFT systems used by different units and services. SOF forces used the COBRA-based BFT systems due to the security advantages while Coalition Forces Land Component Command (CFLCC) main formations used FBCB2. BFT systems gave operational level commanders the most robust COP to date by substantially increasing their situational awareness.

Program Status. Initially fielded 400 GB to USASOC, USAREUR, and USARSO. Currently procuring an additional 400 systems for USASOC to support ongoing real-world contingency operations. There are approximately 3000 MTX systems produced and fielded to SOCOM components, e.g., every USAF Special Operations Command airframe and ground team has an MTX. The GB was acquired as a Warfighter Rapid Acquisition Program product, and the MTX and the MMC were developed and fielded as a result of Combat Mission Needs Statements.

Satellite Communications (SATCOM)

Description. SATCOM capability is key to leveraging other space capabilities. SATCOM systems will provide a robust, flexible and seamless network capability that extends and in some cases replaces terrestrial capabilities with responsive, beyond the line-of-sight communications throughout the battlefield that permits users to access large databases necessary to support strategic, operational and tactical missions. SATCOM global connectivity supports the command and control functions of planning, coordinating, directing and controlling. This capability is essential for the real-time direction of operations at each echelon of command. SATCOM enables tactical forces to exploit improved capabilities to coordinate fires, conduct operational maneuver on the unstructured, asymmetric battlefields of today, assess the effects of previous operations and anticipate enemy actions. An integrated high-capacity SATCOM backbone provides reachback connectivity that allows implementation of split-based command and control and logistics support concepts. This architecture will also support interoperability with joint, coalition, commercial, and civil communications networks. As a result, Current and Future Forces will have reliable, on-demand, beyond-/non-line-of-sight communications for enhanced early warning, en route mission planning and rehearsal, and responsive CSS while maintaining a reduced footprint in theater. Reliable SATCOM enhances increased responsiveness, agility, versatility, survivability and sustainability.

Program Status. The Milstar Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) is the only protected (anti-jam) wideband, beyond-line-of-sight capability for Army divisions and the SBCT. It is currently in production and continues to be fielded. The Phoenix, an SHF Multi-Band Satellite terminal system HMMWV-mounted, air-transportable, was awarded a development contract on 15 Apr 03. The first Phoenix fielding is projected for 3QFY04. Tri-band terminals (X, C and Ku) will be fielded in FY04 and FY05 and the quad-band terminal fielding (adds Ka Band) is planned for FY06 and out. Phoenix will be fielded to Echelon Above Division (EAD) signal units.

Global Positioning System (GPS)

Description. GPS is a spaced-based radio position/navigation (POS/NAV) system that provides extremely accurate, continuous, all weather, common grid, worldwide navigation, three-dimensional positioning, velocity and timing (PVT) information to land, sea, air, and space users. Components are the space, ground control, and user equipment segments.

Program Status. The Defense Advanced GPS Receiver (DAGR) includes the Selective Availability Anti-Spoofing Module and will replace the current Precision Lightweight GPS Receiver (PLGR), which will be cascaded to other units, primarily in Force Package 4. Milestone C decision is projected for 2QFY04 with fielding beginning in 1QFY05. The DAGR itself will be replaced by an improved DAGR projected for FY13 when the associated satellite constellation and ground control stations have reached FOC.

Single Channel Ground and Airborne Radio System (SINCGARS)

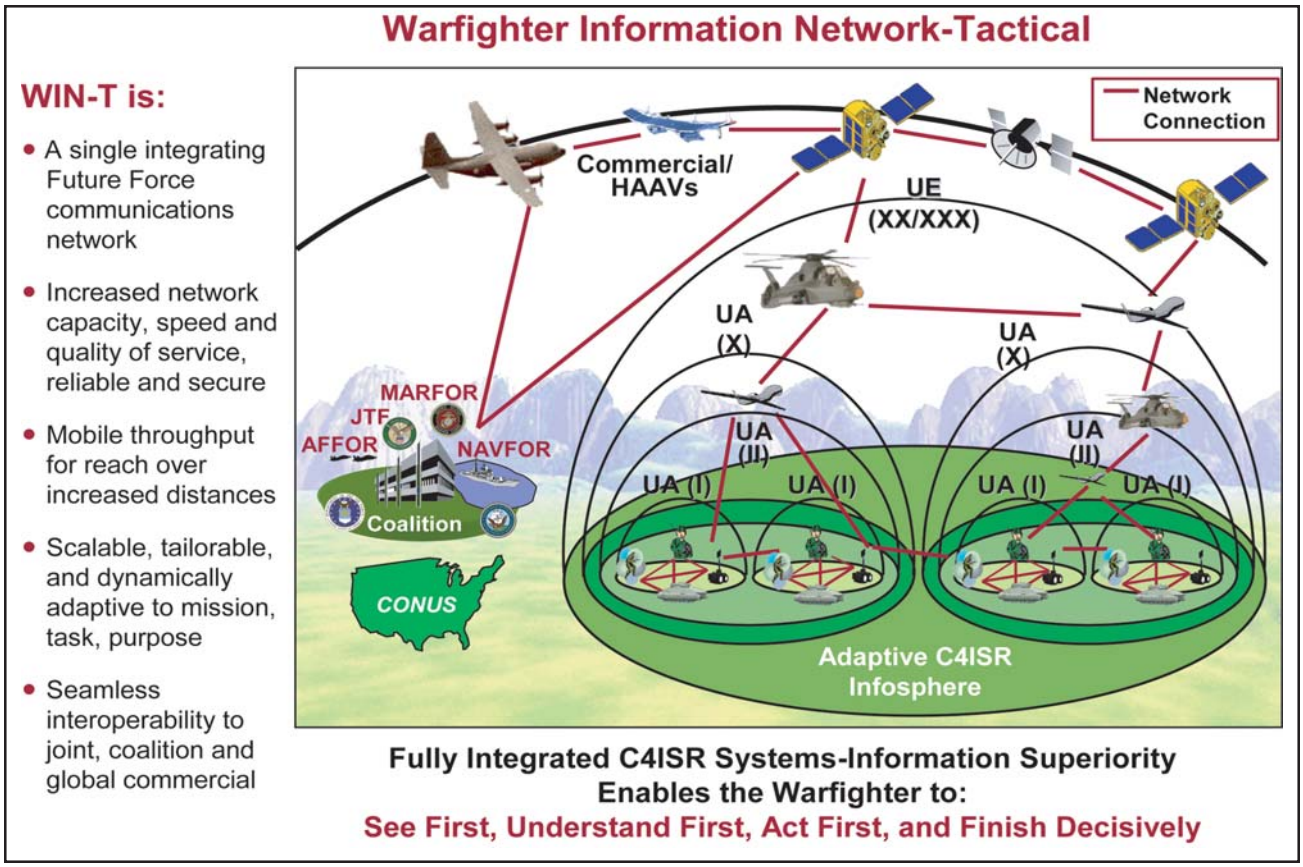
Description. SINCGARS provides commanders with a highly reliable, secure, easily maintained Combat Net Radio that has both voice and data handling capability in support of C2 operations. SINCGARS, with the Internet controller, provides the communications link for the digitized force. The Advanced System Improvement Program (ASIP) models are of a reduced size and weight, providing further enhancements to operational capability in the Tactical Internet environment.

Program Status. A production delivery order was awarded in 3QFY01 to procure congressionally directed assets for the Army National Guard and SBCTs. As of May 03, approximately 245,888 radios have been fielded.

Warfighter Information Network–Tactical (WIN-T)

Description. WIN-T is the integrating communications network for the Future Force, optimized for offensive and joint operations, while providing the Theater Combatant Commander the capability to perform multiple missions simultaneously with campaign quality. It will be a framework that will set standards and protocols for Future Force information spheres while interfacing with and/or replacing equipment in current and Stryker forces. WIN-T employs a combination of airborne, terrestrial, and space-based (military and commercial) network options to provide speedy, comprehensive, and protected voice, data, and video coverage to war fighters. The network infrastructure will route information in the most operationally suitable and bandwidth-efficient manner possible. The WIN-T network will also have the capability to establish virtual dedicated paths, when needed, to support users with a need to exchange critical information on a real-time basis (e.g., air defense, fire support).

Program Status. Milestone B decision for WIN-T to enter SDD was in Jul 03. Using modeling and simulation, prototypes will be



developed and tested in 4QFY05 to support a Milestone C decision in 1QFY06.

Joint Tactical Radio System (JTRS)

Description. JTRS is the joint Service family of common software-defined programmable radios that will form the foundation of information radio frequency transmission for *Joint Vision 2020*. JTRS will ultimately become the Army's primary tactical radio for mobile communications. This lightweight, multi-band radio will provide voice, data, imagery, and video communications. Additionally, it will replace multiple current radio systems within the Army's inventory and will be a key component of the Tactical Internet (TI). JTRS will provide a family of affordable, high-capacity, modular communications systems for line-of-sight (LOS) and beyond line-of-sight (BLOS) command, control, communications, computers, and intelligence (C4I) capabilities for the warfighter. This system is being designed as a secure, multiband, multimode, and software reprogrammable, digital radio networking system that will support the broad range of C4I requirements. The Army is the lead Service for Cluster 1 (ground vehicular/ airborne rotary wing aviation system) and Cluster 5 (handheld, man pack, and small form fit form factors).

Program Status. The JTRS ORD was updated in Mar 03 to Version 3.2. JTRS is in the SDD phase with a Milestone C decision scheduled in 3QFY06, Multi-Service Operational Test and Evaluation in 1QFY07, and full rate production in FY08.

Army Common User System (ACUS) Modernization Program [Mobile Subscriber Equipment (MSE) and Tri-Service Tactical Communications (TRI-TAC)]

Description. ACUS is the tactical terrestrial communications and information system that currently consists of the TRI-TAC and MSE systems. Upgrades to the systems provide an increased capability to support voice, data, and video requirements in one of two ways—Tactical High Speed Data Network (THSDN) and technology insertion. The ACUS modernization efforts support Army Transformation initiatives by inserting new technologies (e.g., Brigade Subscriber Node, battlefield video-teleconferencing, wireless LAN, and Network Operations Center Vehicles (NOC-V)) into SBCTs 1-4, and Base Band Node (BBN) Joint Task Force capabilities into SBCTs 5 and 6, and Joint Task Forces.

Program Status. THSDN fielding to the force was initiated in FY00 and completion is anticipated in FY04. The ACUS Technology Insertion is on track for fielding completion to III Corps in FY04.

Command and Control (C2) Summary

Army C2 and JC2 supported by fully leveraged communication and computers and intelligence, surveillance, and reconnaissance capabilities are at the very core of realizing the required characteristics envisioned in the Future Force. Networked communications and intelligence packages will dramatically improve command and control making it possible to achieve significant advances in strategic responsiveness. The Army has already made important steps towards this goal. The ABCS and the C4 and ISR infrastructure for the current digitized forces provides a real-time blue force picture to ground maneuver units. The artillery, and air and missile defense components of ABCS are interoperable with both joint and multinational systems. ABCS can also leverage theater assets, like JSTARS. During OEF and OIF the Army demonstrated a significant increase in combat power when it exercised these capabilities. The Army will continue to incorporate lessons learned from operating ABCS in developing the C4 and ISR infrastructure for the Future Force.

Annex D Summary

Annex D to the *2004 Army Modernization Plan* provides an overview of key Army materiel programs funded in PB05. These programs are framed within the five emerging joint functional concepts/capability categories used by the new Joint Capability Integration and Development System (JCIDS) process to analyze Joint Force future requirements and guide Army and other Service modernization efforts towards those requirements as they emerge. Other annexes in the *2004 Modernization Plan* examine modernization paths of Doctrine, Training, Installations, Personnel and Force Structure.

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ANNEX E: PERSONNEL

Introduction

Having the right quality and quantity of personnel (whether military, civilian, or contractor) at the right place and time is vital to continued Army readiness and modernization. Moreover, the Army requires modern, web-enabled tools to manage, as well as provide, personnel support to the force in ways that are relevant, reliable and responsive to today's environment. Winning the global war on terrorism and Personnel Transformation (PT) are our orientations.

The PT initiative fundamentally changes the way the Army manages its manpower (forces and structure) and personnel (Active and Reserve Components (AC/RC), families, veterans, retirees, Department of the Army civilians (DACs), and contractors). It includes the transformation of manpower and personnel programs, policies, processes, and systems associated with each of the eight personnel life-cycle functions that comprise the personnel system of the Army.

1. Implementation of an enterprise-wide personnel and pay system will provide a single, authoritative data source and integrate all applications on one platform. This will centralize and simplify the personnel community's information technology solutions, enhance responsiveness, improve data accuracy, and enable reach.

2. Civilian personnel management initiatives will improve management support for DACs and overcome workforce shortfalls anticipated over the next ten years due to retirements.

3. Manning objectives will reshape, stabilize and train the force for transformation to the Future Force and joint and interagency operations.

4. "Continuum of service" will support moving "in and out" of components based on the needs of the Army and the individual.

5. Scientific studies will address selection, classification, recruiting, and retention of Soldiers.

6. MANPRINT promotes superior operational suitability through planned Soldier-system design. It yields safer systems with more efficient use of manpower, personnel and training.

7. Army well-being will help support Army Transformation by improving Soldier performance, readiness, recruiting and retention. Two ongoing well-being initiatives are Rest and Recuperation (R&R) and Deployment Cycle Support (DCS).

8. Force stabilization will increase combat effectiveness, sustain high levels of readiness, and provide for trained and cohesive units while reducing personnel and unit turbulence and other factors, which detract from achieving increased combat effectiveness.

Personnel Transformation

PT will improve how we acquire, distribute, develop, deploy, compensate, sustain, and structure all categories of personnel in all components. Transformation requires changes in how we organize, equip, man, train and employ our personnel, activities and formations on the battlefield, as well as in garrison. PT seeks to provide better human resources (HR) support to Soldiers on the battlefield, while dramatically reducing the personnel/unit footprint in the battlespace. Much of the human resources services and support will be accomplished through reach capabilities provided by an enterprise personnel and pay solution afforded by fielding of the Defense Integrated Military Human Resources System (DIMHRS).

The Enterprise Approach

Enterprise architectures facilitate change and offer Army human resources providers the enabler to become a culture of innovation. An enterprise architecture will provide the full-spectrum support system that meets the demands and expectations of the Army's Future Force. It will be knowledge-based and sophisticated but simple-to-use, near real-time, 24/7-accessible, and responsive to the commander and Soldier. Traditional battlefield services such as postal operations; morale, welfare, and recreation (MWR) services; casualty operations; personnel accounting and strength reporting; replacement operations; and essential personnel and pay services will continue to be provided to the deployed Soldier as part of the Army G-1 mission, but will be administered differently and more efficiently.

Army Enterprise Human Resources System (Army eHRS)

The Army's human resources community will address those processes and capabilities DIMHRS does not fulfill by purchasing and implementing additional compatible modules of commercial off-the-shelf (COTS) products and standing up a lab, or "sandbox," to explore the potential usefulness of the additional modules. The Army will leverage available technology, implement improvements to enhance capability, prepare customers for change, and position intermediate personnel systems for transition to COTS. Much progress to date has been achieved in the current high operational tempo (OPTEMPO) environment without external funding, but in most cases can only continue with additional financial and manpower resources.

Standard Installation/Division Personnel System-3 (SIDPERS-3) Migration to Electronic Military Personnel Office (eMILPO)

The Army migrated the Active Army from SIDPERS-3 to eMILPO in August 2003. This migration served several purposes: 1) to reduce errors through consolidation of 43 installation databases into one integrated database; 2) to enhance the field's ability to do strength accounting via a web application; 3) to simplify and eliminate redundant business processes and prepare the field for revolutionary change anticipated with incoming PeopleSoft products; 4) to mitigate any risk of delay in the scheduled fielding of the DIMHRS; and 5) to provide critical mobilization capability to ensure visibility of RC Soldiers on active duty.

Defense Integrated Military Human Resources System (DIMHRS (Pers/Pay))

The Army is in the forefront of the Department of Defense (DOD) effort to develop the congressionally mandated DIMHRS, which will be implemented using PeopleSoft, a COTS human resources management system. DIMHRS will provide an unclassified, single, integrated military personnel and pay management system for all DOD military personnel during peace, war and mobilization/ demobilization. DIMHRS creates a single record of service for each Service member. This record supports the Service member throughout his or her entire career regardless of his or her status, ensuring accurate and timely access to information for all authorized users, including Service members themselves. In an effort to fuse this DOD endeavor with its ongoing PT initiatives, the Army has volunteered to be the first Service to field DIMHRS. The projected initial operational capability (IOC) of DIMHRS for the Army is FY06.

Army Knowledge Management (AKM)

Army PT initiatives are partnered with the AKM initiative. AKM is a comprehensive strategy developed by the Army Chief Information Officer to provide a web-based portal for both the Active Army and RC. It will manage the information technology (IT) infrastructure with a view toward reducing the support footprint and creating easy access to data between remote or geographically dispersed elements. Access to personnel systems and services will be through Army Knowledge Online (AKO) as the enterprise web portal. AKM is a key component of Army Transformation and PT.

Personnel Transformation Challenges

The Army has over one million military personnel geographically dispersed across seven continents. Soldiers are continually moving both geographically and between components of the Army and duty status, entering and exiting the Army, and requiring frequent personnel services. The Army currently relies on five separate databases and over a thousand different applications, subsystems, reports, and queries to manage the force. Many of these databases and subsystems use different data standards and protocols, making modernization and integration difficult and expensive. A single, integrated military personnel and pay management system is critical. Such an integrated personnel database will allow better tracking of Soldiers from mobilization to the battlefield and back, managing sensitive casualty information in a media rich environment, and measuring the OPTEMPO of individual Soldiers. Future Force Soldiers will train for a more complex warfight. As a result, there will be an ever-increasing need for quality recruits. The Army will be in sustained competition with industry to identify and recruit quality people with an aptitude for high-tech skills. After initial training, these Soldiers must sustain current skills and develop new skills needed to stay current with rapidly changing technology. As these highly skilled Soldiers reach decision points on whether to continue their careers in the Army, competition will remain keen from the civilian job market, where opportunities abound for their qualifications. Increased security concerns provide additional challenges in providing readily accessible information to leaders, while protecting the privacy of the individuals served by the personnel community. Security concerns put multiple demands on our HR assets, draining our units, leaders and Soldiers of valuable time and energy once applied to other areas of mission

accomplishment. Recent homeland defense demands further stress the Army's ability to fund efforts such as well-being programs for Soldiers and their families, as well as personnel research and development, and personnel systems improvements for PT. The Army personnel community continues to improve data quality, reduce redundant manual input of common data elements, and eliminate manpower intensive analysis of raw information. These improvements will be complemented by efficiencies realized from the enterprise approach to Army HR systems, business process reengineering, leveraging web technology, data cleansing, and preparing for a multicomponent, joint, DOD pay and personnel system. All these efforts are designed to improve strategic responsiveness, enable Army Transformation, enhance personnel services, and provide reach capability, thus enabling reductions in redundant layers of personnel staff on the battlefield.

U.S. Army Human Resources Command

The October 2003 merger of the U.S. Total Army Personnel Command (PERSCOM) in Alexandria, Virginia, and the U.S. Army Reserve Personnel Command (AR-PERSCOM) in Saint Louis, Missouri, was an initial step to a number of leadership decisions to transform HR operations. The U.S. Army Human Resources Command (HRC) is responsible for HR management at the Army Field Operating Agency (FOA) level. As a baseline for the new organization, PERSCOM and the AR-PERSCOM consolidated into a multicomponent FOA under the Army G-1. The Army National Guard HR functions will team with the new organization where possible and the Civilian Human Resources Agency (CHRA) in Aberdeen, Maryland, will integrate a number of years later. The purpose of consolidation is to streamline HR functions to meet the Army's institutional and operational needs.

Army Systems of Systems Architecture Human Resource Database (SOSA-HR)

The SOSA-HR is the Army's personnel system data repository. It provides an accountability of personnel systems, applications, reports, extracts, and databases maintained within the Army HR community. The SOSA-HR is the single centralized personnel management information tool that tracks detailed information about the inventory of Army personnel systems and their interfaces. All personnel systems were required to be registered in the SOSA-HR to obtain Headquarters, Department of the Army (HQDA) funding. The SOSA-HR is a living document that portrays a current view of the Army G-1 "as-is" personnel information systems architecture. It contains vital system information such as personnel systems description; the components' administrative information (name, address, telephone number, etc.); listing of system interfaces; HR Management Model; HR Activity Hierarchy Diagram; baseline Information Architecture Diagram; and other important functional and technical information. This repository of information is accessible via the Internet at (https://www.armyhr.hoffman.army.mil) with a preapproved password. The SOSA-HR is a

tool that will help facilitate a smooth data migration from legacy systems to DIMHRS.

Strength Management System Redesign (SMSR)

SMSR is designing and building a new Army strength analysis and forecasting system for the Army G-1 and all stakeholders. This multiyear effort is scheduled for completion in December 2003. The new models (collectively known as the Active Army Strength Forecaster (A2SF)) use the latest algorithms, processors, databases, and telecommunications to form a state-of-the-art strength management and forecasting system. This system will increase flexibility in modeling manpower policies and programs; simplify operator efforts and provide greater accessibility though web-based technology; project strength levels within a half percent two years out; provide 50 percent faster personnel program development time; reduce current system operation and maintenance (O&M) costs by a half million dollars per year; validate, cleanse, and process personnel data and update forecasting methodologies and mathematical models.

Army Selection Board Process (ASBS)

ASBS is the Army's solution for HQDA centralized selection boards that will provide electronic access to personnel records, official photographs, and automated management of board processes. The ASBS will fulfill the centralized board function by constructing electronic board files, validating the contents of the electronic files, and presenting the files to voters for scoring. An interface between the existing board support systems and the ASBS will be necessary to electronically pass candidates' files back and forth. ASBS will be developed, tested and fully deployed in a phased approach at HRC, National Guard Bureau (NGB), and scaled for use by appropriate headquarters.

Army University Access Online/eArmyU

This award winning online program expands opportunities for Soldiers to attend college while serving on active duty. It offers Soldiers the opportunity to earn degrees anytime, anywhere, at no personal cost, by covering tuition, books and fees, plus providing a laptop computer, printer and Internet service account. Initially fielded at Fort Campbell, Fort Hood, and Fort Benning, eArmyU now serves over 10,000 Soldiers. The e-learning portal provides single website access to degree programs at 23 academic institutions with course delivery, library use, tutoring, and administrative services. Continued fielding, contingent on funding, is planned for eight additional installations. Presently, eArmyU expands education availability to those Soldiers who, for whatever reason, have not been able to enroll in traditional, scheduled classroom programs. Through eArmyU, Soldiers have an online capability to earn a degree without regard to duty hours, deployment schedule or family issues.

Manning the Force

The present force stabilization system is under review in a cooperative effort led by TRADOC. The Army is adopting a deliberate and multifaceted approach in developing and implementing a plan of action to overcome personnel turbulence. TRADOC is leading a task force to address implementing a force stabilization policy approach versus the current individual replacement system. The task force is addressing issues such as: 1) what units, what size and in what priority to conduct the first tests of a force stabilization policy? 2) What are the impacts on readiness and availability? 3) What are the cyclical impacts of a force

stabilization policy? 4) Where does force stabilization start and end, at the unit or after basic or advanced individual training? This is not a complete list of issues, by any means; new issues will be raised that will require thoughtful analyses. The Army's rotation policy is under concurrent examination, led by the Army G-3. The two task forces will collaborate frequently to resolve and focus on specific issues. The rotation task force will address issues such as: 1) What Army force structure and missions lend themselves to unit rotation versus individual rotation? 2) What size of units can be rotated? 3) What frequency is best that will balance human considerations and mission requirements? If pilot tests support changes in manning policies, the Army will consider developing all new Army rotation and manning policies and identifying related force structure and personnel policy changes necessary to enable the Army to sustain the global war on terrorism indefinitely. The Army will establish policies for the length and frequency of tours and deployments for the AC/RC. This will lead to a thorough force structure analysis that will result in recommended force structure adjustments, including possible adjustments to the AC/RC mix. Another area that will be addressed is defining the right mix of manpower among military, DACs and contract support. The Army will clearly delineate core and noncore functions in efforts to outsource or privatize noncore functions. Additionally, policy exceptions will be identified in order to cover near-term issues until force structure can be properly adjusted.

Force Stabilization

The driving concept behind force stabilization is to produce highly cohesive combat teams capable of increased operational effectiveness. To achieve unit cohesion and higher operational capability in our combat units, the Army must: 1) synchronize the

assignments of large numbers of Soldiers with training and employment of (unit-manned) units; 2) manage personnel gains and losses to reduce daily personnel turnover stemming from the individual replacement system; and 3) manage force modernization and force structure changes within the force stabilization concept. Force stabilization serves as a key enabler for unit rotations by synchronizing the assignment of Soldiers with the unit's operational timeline. Soldiers that ETS, PCS, etc., during the unit life cycle will not be assigned to the unit; thus losses experienced during today's deployments will not occur. Force stabilization also provides commanders with a predictable environment where they will be able to build and sustain high-performing, cohesive teams. Force stabilization will reduce deployability problems because Soldiers timelines will be synchronized with the unit's life cycle.

Continuum of Service

The Army will institutionalize personnel support for a lifetime of service. The key reason is flexibility in support of modular and tailorable forces. This includes formalizing the concept of continuum of service supporting "in and out" of active duty, based on the needs of the Army and the individual. The retirement system will take all service into account and will provide for adjusting benefits based on "in and out."

Incentives will be developed and instituted to reward voluntary returns to active duty if needed after retirement from a traditional career of service. Personnel life-cycle management policies will allow all Soldiers to share flexibility in career management. Through the eHRS, all Soldiers will have the option of continuing service throughout a career—from new recruit, to AC, to RC, to retiree or contractor; within the Army but in different components or status under the concept of continuum of service. The ability to move from AC to RC status and back will allow trained and experienced Soldiers and leaders to serve continuously.

Online Civilian Personnel Systems

The Army is in the forefront of initiatives to create a fully automated civilian personnel support system that is web-based, real-time and 24/7-accessible for Civilian Personnel Operations Centers (CPOCs), Civilian Personnel Advisory Centers (CPACs), managers, and employees. Some facets are DOD- and federal-wide in scope. In an effort to continue the full integration of DACs into the overall force, civilian data requirements are being identified and incorporated into the Army's integrated database. A critical step that has recently been accomplished is the centralization of information currently residing in our eight regional databases worldwide. In a continued thrust to streamline processes and provide more flexibility to managers, the Army's 180,000 civilian job descriptions will be reduced to no more then 15,000, which will be accessible online. The long-term goal is for all DACs to have access to their official personnel files online. To assist DACs to better understand their benefits, entitlements and procedures while deployed, a civilian mobilization web page is being activated within the Civilian Personnel Online (CPOL) website. Finally, the Army Benefits Center–Civilian (ABC-C) now provides a full range of benefits service to Army employees worldwide through a centralized contact center.

Inherently Governmental and Commercial Activities (IGCA) Database

The Army uses the IGCA, a planning process for determining which positions and functions the military, DACs, the private sector, and other executive agencies should perform or divest. Following these determinations, the process develops implementation plans for the appropriate sourcing or divesting course of action. No federal employee job will be converted to private sector performance without the opportunity for the installation to compete the function using a public-private competition process such as the A-76 process or some other methodology currently permitted by statute. The IGCA process will not reduce military end strength as one of its consequences. Any military positions affected by the IGCA process will convert to fill higher priority core military functions. The Army is using this process to identify military-to-civilian and/or contract conversion possibilities and to find ways to pay for these conversions through the savings generated from competition or divestitures. Freeing up resources for the global war on terrorism is one of the primary reasons motivating the IGCA effort. Before asking for additional resources, the Army believes it essential that we ensure we are properly utilizing military in functions that require military training and skills. Military costs about 36 percent more than DACs, largely because of specialized training and deployment costs. Therefore, it is imperative that we objectively identify military performing noncore tasks that can be divested or competed, so that we can then shift those military to special operations and other military-related priorities in the operating forces. In addition, the IGCA is not merely limited to reviewing the use of military in noncore functions in the infrastructure. The

IGCA also is attempting to program for Army logistics transformation and PT objectives. Current doctrine in *FM 100-21, "Contractors on the Battlefield,"* provides that contractors may operate in the combat zone as long as the tactical situation and governing contract makes it possible. Doctrine, policy and procedures must be updated to address how contractors are accounted for both in garrison and when deployed in support of contingences. Current Army acquisition policies instruct developers to create sustainment concepts that get contractors out of the division area. In the meantime, the emergence of high-technology systems in the combat zone has required increasingly forward deployment of contractors. Changes in support concepts and doctrine that are currently proposed in support of Army Transformation may facilitate not only the contracting of functions but also further enable the transformation efforts. Such concepts may in some aspects obviate the requirement for forward support and allow support to be provided by contractor personnel in rear areas. We must also consider those functions that by statute must be performed by government personnel, keeping in mind that one objective of this process is to release military from functions that can be performed by DACs, so military personnel can be employed in missions requiring military in uniquely military roles and missions.

Authorized Level of Organization (ALO-1) Army

In concert with Army G-3 and others, we are working to create and fill an ALO-1 Army. This means documenting spaces properly; reducing overload, augmentees, and support personnel; and working with the Surgeon General, to ensure that all Soldiers are deployable and positioned prudently. Our warfighting future demands that we craft and fill units engaged in the current fight and those engaged in the next

fight—all Soldiers will have the opportunity to deploy and serve.

MANPRINT Program

Tomorrow's battlefield will be a complex environment, filled with new equipment and technologies. Real battlefield effectiveness results from a good match between the people who operate and maintain the equipment and the equipment itself. At the heart of the Army Vision are well trained Soldiers, using state-of-the-art equipment to win wars. The Army's program to ensure that Soldier issues are key considerations in system design, development, and acquisition is called MANPRINT. The objectives of MANPRINT are to: 1) optimize both the quantity and quality of the personnel needed for systems; 2) design systems that are easily useable by Soldiers, safe to operate, cause no unnecessary health problems, and maximize Soldier survivability; 3) ensure acceptable trade-offs are made among performance, design and Soldier issues.

MANPRINT's Strategic Value to the Army

The MANPRINT process employs task and functional analyses and modeling to best determine personnel efficiency in operating and maintaining systems. The analyses, matched with the relevant personnel attributes and well-

planned training, yield lower manpower requirements per system. Because early design decisions are so critical to life-cycle costs, MANPRINT must be employed early in a system's developmental cycle to maximize out-year operational and support savings. The continual improvement in MANPRINT techniques and tools relies on adequate funding of additional Soldier-oriented research and development. As we continue to push the envelope for battlefield dominance through technology advancements and innovations, we must ensure that the Soldier, as stated in the Army Vision, remains the centerpiece of our formation.

Army Well-Being

The Army's Well-Being initiative will help support Army Transformation by improving Soldier and DAC performance, readiness, recruiting and retention. Well-Being is defined as the personal state—physical, material, mental, and spiritual—of Soldiers (Active, Guard, Reserve, retirees, veterans), DACs, and their families that contributes to their preparedness to perform and support the Army's mission. The goal is self-reliant Soldiers, DACs, and families contributing to the Army team. Well-Being programs contribute to Army strength by producing self-reliant individuals who are able to focus on the mission (thus supporting readiness), knowing that their personal lives are in balance and their needs are being met. This in turn creates a strong bond between individuals and the Army, directly affecting retention and recruiting. The inherent responsibility for Well-Being is shared by individuals and leaders. Ultimately, individuals decide how best to ensure their own Well-Being and that of their families. However, the Army should provide an opportunity for individuals to attain the sense of Well-Being they desire. Well-Being is actually a "condition" resulting from a system of individual programs. As such, Army Well-Being represents the Army's coordinated efforts to integrate policies, programs, and issues into a holistic and systematic framework that supports mission preparedness as well as individual aspirations. There are four strategic goals for Well-Being: 1) (To Serve) Provide an opportunity for service and meaningful personal development in a disciplined environment; 2) (To Live) Provide a competitive standard of living for all Soldiers, civilians, and their families; 3) (To Connect) Provide a unique culture, sense of community, and a record of accomplishment that engenders intense pride and sense of belonging among Soldiers, DACs, and their families; 4) (To Grow) Provide an environment that allows Soldiers, DACs, and their families to enrich their personal life by achieving their individual aspirations. Well-Being is taking care of people now and into the future while winning on the battlefield. Changing external influences on the Army demands higher levels of vigilance in the management of our people programs that support this mission. Well-Being will enable commanders by providing tools for management capability while developing a holistic strategy for structuring and implementing all people programs. Taking care of people requires cultural change among people in the Army, acknowledging the linkage between people issues and unit readiness, providing a competitive lifestyle with middle

class America, and committing available resources in support of people needs.

Deployment Cycle Support (DCS) Program

The Army is executing a DCS concept plan that prepares Soldiers and DACs for returning home to spouses and family members. To ensure a smooth transition, Soldiers, DACs, and family members will participate in a number of classes, discussions, and assessments. For deployed Solders and DACs, the DCS process begins in theater (family members at home stations) and continues at demobilization sites and home stations.

To assist AC Soldiers, mobilized RC Soldiers and deployed DACs, the Army initiated a 1-800 line known as Army One Source (AOS). AOS includes information and referral 24/7; six face-to-face counseling sessions; and crisis education materials. AOS became operational August 2003.

Additionally, the Army initiated Post-Deployment Care Management (PDCM) to provide continuous medical screening and assistance to AC and RC Soldiers and their family members. PDCM covers deployment related health concerns, embedding deployment health care ombudsmen/ advocates into primary healthcare, and other medical related concerns in support of Soldiers and family members.

Rest and Recuperation (R&R) Program

On 23 September 2003, the Under Secretary of Defense, Personnel and Readiness, approved an R&R Leave Program for personnel serving in CENTCOM AOR in support of Operation Iraqi Freedom. CENTCOM also authorized personnel four days of off-duty "pass" to R&R locations throughout the theater in the Fighter Management Program. The R&R Pass and Leave Programs are separate yet complementary programs.

On 25 September 2003, CENTCOM initiated the Interim R&R Leave Program for all Service members, Active or Reserve; DACs; and nonappropriated funds (NAF) civilian employees assigned to a 12-month tour of duty. The R&R Leave Program provides eligible individuals two weeks of chargeable leave between their third and eleventh month in theater.

On 29 September 2003, the Office of the Secretary of Defense (OSD) designated the Army as the Executive Agent (EA) for the CENTCOM AOR R&R Leave Program. OSD also approved the designation of three additional "gateways" (aerial ports of embarkation/aerial ports of debarkation (APOEs/APODs)): Atlanta, Dallas/Fort Worth, and Los Angeles.

Operational requirements and Service member preference are all factors in determining which individuals participate in the R&R Leave Program at a given time. Prior to intra-theater movement, commanders conduct R&R leave briefings with assigned personnel that include modified DCS tasks (i.e., risk assessment, medical, reunion/reintegration, and suicide prevention). Tasks at the gateways include, but are not limited to, customs screening and onward travel arrangements to facilitate individual personnel R&R leave plans. CENTCOM proposes to expand the program to the entire AOR in support of the global war on terrorism.

Conclusion

The Army must continue to man the force with exceptional Soldiers and DACs, sustain the

force with efficient and effective management systems, and ensure the human dimension is considered in the development of new systems and equipment. First and foremost, the Army must support commanders in the field with personnel systems and information that enhance warfighting capability and agility. Complete success in transforming the Army to the Future Force will only be achieved by taking care of the Army's most valuable asset—People. The initiatives of the personnel community target the Army needs from a broad, holistic perspective, and remain focused on "boots on the ground" to achieve the Army's mission.

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ANNEX F: INSTALLATIONS

Introduction

As briefly addressed in the main body of the *2004 Army Modernization Plan*, Army leadership has recently identified a number of immediate focus areas for more intense examination and recommendations for potential near- and midterm actions. In the area of Army installations, the specific focus area is identified as "Installations as Flagships." Our installations support a joint and expeditionary force where Soldiers train, mobilize and deploy to fight and are sustained as they reach back for support. Soldiers and their families who live on and off installations deserve the same quality of life as is afforded the society they are pledged to defend.

Installations provide deployment platforms with robust reachback capabilities as well as support for the well-being of Soldiers and their families. There are three essential tasks for flagships: 1) develop strategies to posture installations as deployment platforms with robust reachback capabilities; 2) adjust installation support to meet the needs of the Army at war and transforming; and 3) support the well-being of all Soldiers and their families. Subtasks for these three essential tasks have been developed, and adjustments are underway to align resourcing with all tasks. The Army will continue to develop new strategies while adjusting existing programs to ensure we properly identify and validate our installation requirements.

As the Army transcends to an unprecedented level of force structure change and technology integration, installations will undergo a corresponding change in business processes, roles and responsibilities. Installations provide a foundation through a common set of "base support" services with selected installations providing unique or tailored support capabilities such as combat sustainment, preparation or training. The integrated, collective capabilities and capacities of installations in any given geographic region will far exceed what any one installation can provide. The Army is simultaneously enhancing its joint support role to interagency (domestic) and multinational (international) cooperation. By integrating its services with the surrounding community, Army installations are developing an even stronger environment of civil-military community relations.

CONUS-based installations will continue to support a mix of Current and Future Forces for the next few decades and will serve as an integral component of the extended battlespace from home station to foxhole. As more installations convert to totally Future Force unit stations, excess space can be reallocated to reduce some of the facility maintenance and

repair backlog within a geographic region. At some installations, the combined use of regional assets and recovery of excess facilities will also reduce cramped conditions, thereby improving both the operational posture of the units stationed there and the quality of life or well-being of the Army family on post.

Installations will provide seamless connectivity to Army and Joint Force Commanders across the full spectrum of operations. For example, consolidating sustainment activities into two tiers of support will significantly change how facilities and the installation infrastructure will be used. National maintenance centers will provide centralized support across a region or worldwide, thereby reducing the logistical footprint required at an installation to perform sustainment maintenance.

Training centers will continue to provide unique capabilities that are utilized on a rotational basis to conduct integrated live, virtual, and constructive (LVC) training for combined arms and collective training tasks. These training centers will be simultaneously and seamlessly linked to home station installations or institutional centers to expand their training capabilities. Digitally enabled training facilities and equipment will provide the flexibility for Soldiers, units and command staffs to train from geographically separate locations in a synthetic environment thereby optimizing training opportunities and increasing readiness.

Multipurpose, adaptable facilities and complexes will provide support to consolidated functions such as maintenance, training and logistics in a single complex. Single purpose facilities will be provided by exception as the Army migrates to the Future Force. Installations will no longer need to adopt the "one size fits all" concept. Common information architecture will link all installations to commanders in the field as well as joint, interagency, and multinational (JIM) support infrastructures worldwide. Installations will enable mission accomplishment by simultaneously providing the means of reducing the in-theater footprint of deployed forces and enhance the commander's tool kit by providing the vital information hubs, deployment platforms and sustainment bases.

Having the right installation infrastructure and facility mix at the right place and time is vital to continued Army readiness and modernization. Moreover, the Army requires modern, web-enabled capabilities to manage, as well as provide support across, the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) domains. Hence, the Army Installation Transformation environment will require changes in business processes, policies, and installation management structure, as well as the following attributes and characteristics.

Installation Transformation

Battle Command Support

Installations serve as information hubs and nodes on the Global Information Grid (GIG) that provide reach capabilities necessary to simultaneously link deployed forces with home

stations and link installations within a region. Installation Information Infrastructures (I3) will be sized to meet the challenges associated with transmitting vast amounts of information via fiber optics or space (wireless). As information nodes, installations will provide command, control, and support to rotational or deployed forces throughout the battlespace. The seamless connectivity and interoperability provided by installation information hubs extends the commander's reach to accessing the unique capabilities of knowledge centers or centers of excellence as well as JIM centers for real-time collaboration and an LVC training environment. The same reach capabilities provide the necessary connectivity that enables anticipatory logistics support and increased technical expertise for units whether at home station or deployed.

Deployment Support

Through global stationing, multi-Service/ multifunctional basing strategies and deployment configurations, installations will be aligned with the necessary military and civilian assets to deploy a combat brigade equivalent in 96 hours, a division in 120 hours, and five divisions in 30 days. Strategic power projection capabilities will be optimized through continuous use supporting unit rotations and replacements. Other installations will provide additional capabilities and support within a region through a common situational awareness with deployed forces. Simultaneous deployment from multiple sites provides unprecedented deployment agility and responsiveness to meet a myriad of missions across the full range of military operations.

Combat Preparation and Sustainment Support

Using the combined capabilities of installations, units will train, alert, deploy and employ. Technologies such as networked communications and directed energy weapons will drastically change facility and infrastructure requirements. Vehicle and equipment condition will be monitored through onboard prognostics and diagnostics backed up by performance and Distributed-Based Logistics (DBL) operations. Two-level maintenance and repair-by-replace methodologies will redefine sustainment operations to become more service and supply oriented. The same information hubs will provide asset visibility and anticipatory support from national maintenance and supply centers. Fully modernized installations will no longer require large maintenance and repair facilities as all off-system repairs will be focused on returning line replaceable units and assemblies to supply for redistribution rather than back to the unit for operations. Wholesale supply requirements will be reduced as components are redistributed on post prior to being redistributed within regions and before returning excess stockage to Defense Supply Centers. Similar improvements in the personnel management functions will allow manning and replacement (Soldiers, civilians and contractors) to occur with greater accuracy, flexibility, and timeliness across local, regional, national and global assignments.

Living and Working Environments

The threat environment (e.g., terrorism, biohazards or computer hacking) facing Soldiers, their families, Department of the Army civilians (DACs) and contractors on an installation will require full-dimensional protection. A balance must be achieved as the increased dependence upon installations serving as vital information hubs demands higher levels of security and protection. In the future, installation security and protection may incorporate advanced technologies such as biometrics; smart cards; entity tagging or tracking; networked sensors; chemical, biological, radiological, nuclear and high yield explosives (CBRNE); and weapons/munitions detection capabilities. Security procedures and capabilities will be linked to local, state and federal law enforcement activities, enhancing responsiveness and increasing survivability. The use of emerging and advanced technology such as sensors and detectors can enhance the security posture of the installation without having to resort to an entrenchment or "walled city" environment. When services are integrated within the surrounding community, security considerations may extend beyond the installation boundary to the extent feasible. At the same time, the security posture of installations is less intrusive as the aesthetics remain "pleasing to the eye" while they belie the actual level of protection of the installation. Protection and security considerations may extend beyond the physical boundaries of the installations and include infrastructure support nodes located in, or shared with, the local civilian community or centers of excellence. Installations and communities will become increasingly integrated and mutually supportive.

Regional, city, and installation master planners must work together to leverage common infrastructure and services to create mutual benefits and decrease operating costs. In

some locations, surrounding communities may provide medical, dependent education, recreational or emergency services to mitigate lack of on-post capabilities. In other cases, both civilian and military communities may augment each other in mutual support agreements, thereby maximizing resource investments within a community or region. Environmental strategies, land use and stewardship activities continue to be more fully integrated into business processes and base support services both on post and in coordination with state and local governments to achieve common or mutually supportive objectives. Land use and environmental considerations become less divisive as perspectives and appreciation for the benefits of close community ties outweigh the occasional disadvantages of close proximity to military installations.

Conclusion

In addition to force structure changes necessary to support a joint and expeditionary force, significant improvements in our installations are essential. The key missions for our installations are to provide effective training facilities, rapidly mobilize and deploy the force, sustain and reconstitute the force, and take care of our families.

Army installations are essential to maintaining the premier Army in the world. Installations serve as flagships. For the warfighter, they are power projection and support platforms with robust information infrastructures that support reachback capabilities to allow the Army to respond quickly, efficiently and without disruption to contingencies anywhere in the world. Some key Army installations will be designated as Home Station Operations Centers (HSOC). The Installation Information Infrastructure Modernization Program (I3MP) supports the installations' role in power-projection, reachback capabilities to the deployed force; enables split-based operations; and improves installation business practices. It is the installation-level distribution portion of the Warfighter Information Network (WIN).

On 1 October 2003, the Army transformed the way it manages installations by establishing the Installation Management Agency (IMA), a field operating agency of the Assistant Chief of Staff for Installation Management (ACSIM). This agency creates a corporate-focused structure and provides equitable, efficient and effective installation management worldwide. IMAs are implementing creative management programs to sustain quality installations and maintaining the well-being of the entire Army family, while sustaining the requisite environmental quality to fully support combat training. IMAs free the operational commander at an installation from the time-consuming tasks of running an installation and the delicate balancing of training resources with infrastructure and facilities sustainment.

For Soldiers and their families, installations are configured to provide the same quality of life as is afforded the society they are pledged to defend. The Army has traditionally accepted risk in infrastructure to maintain its current warfighting readiness. However, more than a decade of chronic underfunding has led to a condition where more than 50 percent of our facilities are in such poor condition that commanders have rated them as "adversely affecting mission and training requirements."

Over the past few years, the Administration and Congress have helped the Army begin correcting this situation with innovative business practices. We are working diligently to stem further degradation of our facilities and to improve them.

Much progress has been made, but we have a long way to go to upgrade our installations to support our missions, Soldiers and their families. Adjustments to existing programs have been made and new strategies are being developed. Installations exist to support the warfighters and their continued well-being, and the Army is dedicated to meeting these challenges by providing quality, mission-ready installations for our Soldiers to live, work and train.

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2004 ARMY MODERNIZATION PLAN

Glossary

2GF	2nd Generation FLIR
A2C2S	Army Airborne Command and Control System
A2SF	Active Army Strength Forecaster
AAMDC	Army Air and Missile Defense Command Post
AAO	Army Acquisition Objective
AAR	After action review
ABC-C	Army Benefits Center-Civilian
ABCS	Army Battle Command System
ABT	Air-breathing threat
AC	Active Component
ACADA	Automatic Chemical Agent Detector/Alarm
ACAT	Acquisition Category
ACE	Analysis and Control Element
ACIP	Aircraft Component Improvement Program
ACIS	Aircrew Integrated Systems
ACR	Advanced Concepts and Requirements
ACS	Aerial Common Sensor
ACSIM	Assistant Chief of Staff for Installation Management
ACTD	Advanced Concept Technology Demonstration
ACTF	Army Constructive Training Federation
ACUS	Army Common User System
ADA	Air defense artillery
ADAM	Air Defense and Airspace Management
ADRS	Army National Guard Division Redesign Study
AFATDS	Advanced Field Artillery Tactical Data System
AFSERS	Air Force Synthetic Environment for Reconnaissance and Surveillance
AGRI	Army National Guard Restructuring Initiative
AGSE	Aviation Ground Support Equipment
AIM	Abrams Integrated Management
AIS	Automated information system
AKE	Army Knowledge Enterprise
AKM	Army Knowledge Management
AKO	Army Knowledge Online
ALO	Authorized Level of Organization
AMC	Army Materiel Command
AMD	Air and Missile Defense
AMDCCS	Air and Missile Defense Command and Control System
AMDPCS	Air and Missile Defense Planning and Control System

AMDWS	Air and Missile Defense Workstation
AMI	Adaptive Medical Increments
AMMPS	Advanced Medium Mobile Power Sources
AMPS	Aviation Mission Planning System
AMRAAM	Advanced Medium Range Air-to-Air Missiles
AMRP	Army Master Range Plan
ANAV	Autonomous Navigation System
ANCOC	Advanced NCO Course
AOA	Analysis of Alternatives
AOR	Area of Responsibility
AOS	Army One Source
AP	Anti-personnel
APKWS	Advanced Precision Kill Weapon System
APOD	Aerial port of debarkation
APOE	Aerial port of embarkation
APS	Army Prepositioned Stock
APU	Auxiliary Power Unit
ARFOR	Army Forces
Army C2	Army Command and Control
Army eHRS	Army Enterprise Human Resources System
ARNG	Army National Guard
AROC	Army Requirements Oversight Committee
AR-PERSCOM	U.S. Army Reserve Personnel Command
ARSOF	Army Special Operations Forces
ARV-A	Armored Robotic Vehicle-Assault Light
ASAS	All Source Analysis System
ASBS	Army Selection Board Process
ASE	Aircraft Survivability Equipment
ASLMS	Authorized Stockage List Mobility System
AT	Antitank
ATACMS	Army Tactical Missile System
ATACMS-P	ATACMS Penetrator
ATC	Air Traffic Control
ATCCS	Army Tactical C2 System
AT-CDEP	Army Transformation Concept Development and Experimentation Campaign Plan
ATD	Advanced Technology Demonstration
ATGM	Antitank Guided Missile
ATIRCM	Advanced Threat Infrared Counter Measures
ATLDP	Army Training and Leader Development Panel
ATLDP-O	Army Training and Leader Development Officer Panel
ATNAVICS	Air Traffic Navigation, Integration, and Coordination System
ATR	Automatic target recognition
ATS	Air Traffic Service
ATS	Army Targetry System

AVA	Anthrax Vaccine Adsorbed
AVCATT-A	Aviation Reconfigurable Manned Simulator
AW	Air Warrior
AWIS	Aircraft Wireless Intercom System
BA	Battlespace Awareness
BASIC	Body Armor Set Individual Countermine
BAWS	Biological Aerosol Warning Sensor
BAX	Battle Area Complex
BBN	Base Band Node
BC	Battle Command
BC	Big Crow
BCIS	Battlefield Combat Identification System
BCKN	Battle Command Knowledge Network
BCS3	Battle Command Sustainment Support System
BCT	Brigade Combat Team
BCTP	Battle Command Training Program
BDA	Battle damage assessment
BEMT	Basic Electronics Maintenance Trainer
BFT	Blue Force Tracking
BIDS	Biological Integrated Detection System
BLCSE	Battle Lab Collaborative Simulation Environment
BLOS	Beyond line-of-sight
BLUFOR	Blue Force
BM/C2	Battle Management/Command and Control
BMC4I	Battle Management/Command, Control, Communications, Computers and Intelligence
BMDS	Ballistic Missile Defense System
BNCOC	Basic NCO Course
BOL	Basic Officer Leader Course
BSC	Brigade Support Company
BW	Biological warfare
C2	Command and control
C3I	Command, control, communications, and intelligence
C4	Command, control, communications, computers
C4I	Command, control, communications, computers, and intelligence
C4I2	Command, control, communications, computers, information and intelligence
C4ISR	Command, control, communications, computer, intelligence, surveillance and reconnaissance
CA	Civil Affairs
CAISI	Combat Service Support Automated Information System Interface
CAM/ICAM	Chemical Agent Monitor/Improved Chemical Agent Monitor
CARP	Contingency Augmentation Range Package
CB	Chemical/biological
CBMS	Chemical Biological Mass Spectrometer
CBPS	Chemical Biological Protective Shelter

CBRN	Chemical, biological, radiological and nuclear
CBRNE	Chemical, biological, radiological, nuclear and high yield explosives
CBS	Corps Battle Simulation
CBT	Common Bridge Transporter
CCTT	Close Combat Tactical Trainer
CDR	Critical design review
CE	Chemical energy
CEaVa	Continuous Early Validation
CENTCOM	Central Command
CFF	Central Funding and Fielding
CFFT	Call for Fire Trainer
CFLCC	Coalition Forces Land Component Command
CGF	Computer Generated Force
CGS	Common Ground Station
CGSC	Command and General Staff College
CHRA	Civilian Human Resources Agency
CHS	Combat Health Support
CID	Combat Identification
CIE	Clothing and Individual Equipment
CITV	Commander's Independent Thermal Viewer
CIV	Commander's Independent Viewer
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CKEM	Compact Kinetic Energy Missile
CLU	Container launch unit
CM	Cruise missiles
CM	Cruise missiles defense
CMTC	Combat Maneuver Training Center
CMTC-OIS	Combat Maneuver Training Center-Objective Instrumentation System
COCOM	Combatant command
COE	Contemporary operating environment
COMINT	Communications intelligence
CONUS	Continental United States
COP	Common Operational Picture
COTS	Commercial off-the-shelf
CP	Command Post
CP DEPMEDS	Collectively Protected Deployable Medical System
CPAC	Civilian Personnel Advisory Center
CPE	Collective Protection Equipment
CPG	Contingency Planning Guidance
CPOC	Civilian Personnel Operations Center
CPOL	Civilian Personnel Online
CPX	Command Post Exercises
CROP	Container Roll-in/Out Platform
CRXXI	Classroom XXI
CS	Combat support

CSH	Combat Support Hospital
CSS	Combat service support
CSSCS	Combat Service Support Control System
CTC	Cargo Transfer Company
CTC	Combat Training Center
CTD	Concept and Technology Development
CTIA	Common Training Instrumentation Architecture
CV	Commander Vehicle
CVC	Combat vehicle crewmen
DA	Department of the Army
DAART	Digital After Action Review Tool
DAB	Defense Acquisition Board
DAC	Department of the Army civilian
DAGR	Defense Advanced GPS Receiver
DAPs	Decon Apparatuses: Portable
DARPA	Defense Advanced Research Projects Agency
DBL	Distribution-Based Logistics
DBST	Digital Battle Staff Sustainment Trainer
DCGS-A	Distributed Ground Common System-Army
DCS	Deployment Cycle Support
DCSDCS	Deputy Chief of Staff for Doctrine Concepts and Strategy
DCSOPS&T	Deputy Chief of Staff for Operations and Training
DEPSECDEF	Deputy Secretary of Defense
DERF	Defense Emergency Response Fund
DIMHRS	Defense Integrated Military Human Resources System
DJC2	Deployable Joint Command and Control System
DL	Distributed Learning
DLA	Defense Logistics Agency
DLMP	Doctrine Literature Master Plan
DMPRC	Digital Multi-Purpose Range Complex
DOD	Department of Defense
DOS	Days of supply
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities
DPG	Defense Planning Guidance
DPICM	Dual-purpose improved conventional munitions
DRF	Division Ready Force
DRR	Design Readiness Review (formerly Critical Design Review)
DSB	Dry Support Bridge
DSP	Defense Support Program
DTF	Digital Training Facility
DTI	Doctrine Taxonomy Initiative
DTLD	Doctrine, Training, and Leader Development
DTSS	Digital Topographic Support System
DTTP	Distributed Training Technology Project

EA	Executive Agent
EAC	Echelons above corps
EAD	Echelons above division
ECU	Environmental control unit
EDM	Electronic Data Manager
ELINT	Electronic intelligence
EMD	Engineering and Manufacturing Development
eMILPO	Electronic Military Personnel Office
EMPR	En route Mission Planning and Rehearsal
ENVG	Enhanced Night Vision Goggles
EO	Electro-optical
EOD	Explosive Ordnance Detachment
EPIAFS	Enhanced Portable Inductive Artillery Fuze Setter
EPLRS	Enhanced Position Location Reporting System
ER/MP	Extended range/multipurpose
ERFS II	Extended Range Fuel System II
EST	Engagement Skills Trainer
ESV	Engineer Squad Vehicle
ETRAC	Enhanced Target, Range, and Classification
ETS	Expiration term of service
EW	Electronic warfare
FA	Functional Area
FAAD C2	Forward Area Air Defense Command and Control
FARRP	Forward Area Rearm and Refueling Point
FBCB2	Force XXI Battle Command Brigade and Below
FCB	Functional Capability Board
FCR	Fire Control Radar
FCS	Future Combat Systems
FCS ACE	Future Combat System Advanced Collaborative Environment
FDA	Food and Drug Administration
FL	Focused Logistics
FLIR	Forward Looking Infrared
FM	Field Manual
FMC	Forward Maintenance Company
FMS	Foreign Military Sales
FMTV	Family of Medium Tactical Vehicles
FOA	Field Operating Agency
FOB	Forward Operating Base
FOC	Full Operational Capability
FOM	Family of Munitions
FP	Force Provider
FRP	Full rate production
FS	Fire support
FS3	Fire Support Sensor System
FSC	Forward Support Company

FSV	Fire Support Vehicle
FTI	Fixed Tactical Internet
FTTS	Future Tactical Truck System
FUE	First unit equipped
FUR	Future Utility Rotorcraft
FYDP	Future Years Defense Plan
GATM	Global Air Traffic Management
GB	Grenadier BRAT
GCCS	Global Command and Control System
GCCS-A	Global Command and Control System-Army
GCN	GMD Communications Network
GCS	Ground Control Stations
GCSS	Global Combat Service Support
GCSS Army	Global Combat Service Support Army
GEO	Geosynchronous Earth Orbit
GFC	GMD Fire Control
GIG	Global Information Grid
GII	Global information infostructure
GMD	Ground Based Midcourse Defense
GMLRS	Guided Multiple Launch Rocket System
GOSC	General Officer Steering Committee
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GSE	Ground Support Equipment
GSTAMIDS	Ground Standoff Minefield Detection System
GWOT	Global war on terrorism
HEMTT	Heavy Expanded Mobility Tactical Truck
HEO	High Earth Orbit
HF	Hellfire
HIMARS	High Mobility Artillery Rocket System
HITS	Home Station and Instrumentation Training System
HLA	High Level Architecture
HLVTOL	Heavy Lift Vertical Take Off and Landing
HMMWV	High Mobility Multi-purpose Wheeled Vehicle
HPT	High-Payoff Target
HQDA	Headquarters, Department of the Army
HR	Human resources
HRC	U.S. Army Human Resources Command
HSOC	Home Station Operations Center
HSTAMIDS	Handheld Standoff Mine Detection System
HSV	High-Speed Vessel
HTI	Horizontal Technology Integration
HUMINT	Human intelligence
HVA	High-value asset
I3	Installation Information Infrastructure

I3MP	Installation Information Infrastructure Modernization Program
IBA	Interceptor Body ArmorI
ICAM	Improved Chemical Agent Monitor
ICD	Initial Capabilities Document
ICV	Infantry Carrier Vehicle
IDM	Improved Data Modem
IED	Improvised Explosive Device
IEWTPT	Intelligence Electronic Warfare Tactical Proficiency Trainer
IFC	Integrated Fire Control
IGCA	Inherently Governmental and Commercial Activities
IIR	Imaging Infrared
ILE	Intermediate Level Education
IM	Information management
IMA	Installation Management Agency
IMETS	Integrated Meteorological System
IMINT	Imagery intelligence
IMS	International Military Students
IMTS	Integrated Military Operations on Urbanized Terrain Training System
IMU	Inertial measurement unit
IND	Investigational New Drug
IO	Information operations
IOC	Initial operational capability
IOT&E	Initial Operations Test and Evaluation
IPD	Initial Production Decision
IPT	Integrated Process Team
IR	Infrared
IRB	Improved Ribbon Bridge
ISG	Iraqi Survey Group
ISO	International Standardization Organization
ISR	Intelligence, surveillance, and reconnaissance
IT	Information technology
ITC	Initial Training Capability
ITSB	Integrated Theater Signal Battalion
IUA	Intensive use area
JAGCE	Joint Air-Ground Center of Excellence
JBAIDS	Joint Biological Agent Identification and Diagnostic System
JBMC2	Joint Battle Management Command and Control
JBSDS	Joint Biological Standoff Detector System
JC2	Joint Command and Control
JCAD	Joint Chemical Agent Detector
JCATS	Joint Combat and Tactical Simulation
JCIDS	Joint Capabilities Integration and Development System
JCM	Joint Common Missile
JDLM	Joint Deployment Logistics Model
JFC	Joint Force Commander

JFCOM	Joint Forces Command
JFLCC	Joint Force Land Component Command
JFLCC	Joint Forces Land Component Commander
JFSDS	Joint Service Family of Decontamination Systems
JIM	Joint, interagency and multinational
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
JLIST	Joint Service Lightweight Integrated Suit Technology
JLOTS	Joint Logistics Over-the-Shore
JMA	Joint Mission Area
JMPS	Joint Mission Planning System
JNTC	Joint National Training Capability
JOC	Joint Operating Concept
JOpsC	Joint Operations Concept
JPADS	Joint Precision Air Drop System
JPALS	Joint Precision Approach Landing System
JPME	Joint Professional Military Education
JPS	Joint Portal Shield Detector System
JRA	Joint Rear Area
JRTC	Joint Readiness Training Center
JRTC-OIS	Joint Readiness Training Center Objective Instrumentation System
JSCP	Joint Strategic Capabilities Plan
JSGPM	Joint Service General Purpose Mask
JSLNBCRS	Joint Service Lightweight NBC Recon System
JSLSCAD	Joint Service Lightweight Standoff Chemical Agent Detector
JSM-PDS	Joint Service Man-Portable Decontamination System
JSPDS	Joint Service Personnel/Skin Decontamination System
JSSDS	Joint Service Stationary Decontamination System
JSSED	Joint Service Sensitive Equipment Decontamination
JSTARS	Joint Surveillance Targeting Acquisition Radar System
JSTDS	Joint Service Transportable Decontamination System
JTAGS	Joint Tactical Ground Station
JTAMDO	Joint Theater Air and Missile Defense Organization
JTF	Joint Task Force
JTRS	Joint Tactical Radio System
JVAP	Joint Vaccine Acquisition Program
JWARN	Joint Warning and Reporting Network
KE	Kinetic energy
KLO	Key Leader Option
LAN	Local area network
LDM	Laser Designator Module
LEO	Low Earth Orbit
LHS	Load Handling System
LMFF	Load Handling System Modular Fuel Farm
LMP	Logistics Modernization Program
LMS	Lightweight Multipurpose Shelter

LMSR	Large Medium Speed Roll-on/Roll-off Ship
LOC	Lines of Communication
LOS	Line-of-sight
LOSAT	Line-of-Sight Antitank
LPI/LPD	Low Probability of Intercept/Low Probability of Detection
LRAS3	Long-Range Advanced Scout Surveillance System
LRIP	Low rate initial production
LSI	Lead Systems Integrator
LTT	Light Tactical Trailer
LTT	Live Training Transformation
LUA	Limited use area
LUT	Limited User Test
LVC	Live, virtual, constructive
LVCTE	LVC Training Environment
LW	Land Warrior
M&S	Modeling and Simulation
M3P	Multi-Mission Mobile Processor
MACOM	Major Command
MACS	Modular Artillery Charge System
MASINT	Measurement and signature intelligence
MATREX	Modeling Architecture for Test, Research, and Experimentation
MAV	Micro-Air Vehicle
MC	Mortar Carrier
MC4	Medical Communications for Combat Casualty Care
MCA	Military Construction Army
MCG	Microclimate Cooling Garment
MCO	Major combat operation
MCS	Maneuver Control System
MCS	Microclimate Cooling System
MD	Metal detection
MDA	Missile Defense Agency
MDET	Medium Directional Energy Tool
MEADS	Medium Extended Air Defense System
MEDEVAC	Medical evacuation
MEI	Major end items
MEL	Military education level
MER	Management, evaluation, and resource
METL	Mission essential task list
METT-TC	Mission, enemy, troops, terrain, time, and civilians
MEV	Medical Evacuation Vehicle
MFD	Multifunctional Division
MGS	Mobile Gun System
MIHDS	Modular Integrated Helmet Display System
MILES	Multiple Integrated Laser Engagement System
MIL-STD	Military standard

MLB	Mobile Light Brigade
MLC	Military Load Class
MMC	Mission Management Center
MMR STO	Multi Mission Radar Science and Technology Objective
MMW	Millimeter wave
MOFA	Multiple Option Fuze, Artillery
MOOTW	Military operations other than war
MOS	Military Occupational Specialty
MOTS	Mobile Tower System
MOUT	Military Operations in Urban Terrain
MP3	Multi-Mission Mobile Processor
MPCV	Mine Protected Clearance Vehicle
MRBC	Multi-Role Bridge Companies
MRE	Mission Rehearsal Exercises
MRI	Medical Reengineering Initiative
MRM	Mid-Range Munition
MRX	Mission Readiness Exercises
MS&T	Modular Storage and Transportation
MSD	Maintenance Support Device
MSE	Mobile Subscriber Equipment
MSL	Mean sea level
MSV	Maneuver Sustainment Vehicle
M-TADS/PNVS	Modernized Target Acquisition Designation Sight/Pilot Night Vision System
MTHEL	Mobile Tactical High Energy Laser
MTI	Moving Target Indicator
MTRS	Man-Transportable Robotic System
MTS	Movement Tracking System
MTV	Medium tactical vehicle
MTW	Major theater war
MTX	Mini-transmitter
multi-INT	Multidiscipline intelligence
MUSE	Multiple Unified Simulation Environment
MW	Mounted Warrior
MWR	Morale, welfare, and recreation
MWSS	MW Soldier System
NAF	Nonappropriated funds
NATO	North Atlantic Treaty Organization
NBC	Nuclear, biological and chemical
NBCRS	Nuclear, Biological and Chemical Reconnaissance System
NBCRV	Nuclear, Biological and Chemical Reconnaissance Vehicle
NCO	Noncommissioned officer
NCOES	NCO Education System
NDI	Nondevelopmental item
NET	New Equipment Training
NETCOM	Network Enterprise Technology Command

NETOPS	Network Operations
NFI	Non-invasive Filler Identification
NGATS	New Generation Army Targetry System
NGB	National Guard Bureau
NGO	Nongovernmental organization
NL	Nonlethal
NLCS	Nonlethal Capabilities Set
NLOS	Non-line-of-sight
NLOS-LS	Non-Line-of-Sight Launcher System
NMD	National Missile Defense
NMMDR	Network Maturity Milestone Decision Review
NOC-V	Network Operations Center Vehicle
NOSC	Network Operations and Security Center
NSS	National Security Strategy
NSTD	Non-System Training Device
NTC	National Training Center
NTC-OIS	National Training Center Objective Instrumentation System
NVG	Night Vision Goggles
O&O	Operational and Organizational
O&S	Operations and Support
OAV	Organic Air Vehicle
OBP	Object-Based Publishing
O/C	Observer/Controller
OC/T	Observer Controller/Trainer
OCSW	Objective Crew Served Weapon
ODS	Operation Desert Storm
OEF	Operation Enduring Freedom
OES	Officer Education System
OFW	Objective Force Warrior
OICW	Objective Individual Combat Weapon
OIF	Operation Iraqi Freedom
OIPT	Overarching Integrated Process Team
OIS	Objective Instrumentation System
OMA	Operations and Maintenance, Army
OneTESS	One Tactical Engagement Simulation System
OneSAF	One Semi-Automated Forces
OPFOR	Opposing force
OPTEMPO	Operational tempo
ORD	Operational Readiness Document
OSD	Office of the Secretary of Defense
OSTV	OPFOR Surrogate Tank Vehicle
OSV	OPFOR Surrogate Vehicle
OTA	Other Transactions Agreement
P3I	Preplanned Product Improvement
PAC-3	Patriot Advanced Capability-3

PACOM	Pacific Command
PB05	Fiscal Year 2005 President's Budget
PCP	Program change package
PDCM	Post-Deployment Care Management
PDR	Preliminary Design Review
PEGASYS	Precision, Extended Glide Airdrop System
PEO	Program Executive Officer
PERSCOM	U.S. Total Army Personnel Command
PGMM	Precision Guided Mortar Munitions
PLDC	Primary Leader Development Course
PLGR	Precision Lightweight GPS Receiver
PLS	Palletized Load System
PME	Peacetime military engagement
PME	Professional Military Education
POI	Programs of instruction
POL	Petroleum, oil, and lubricants
POM	Program Objective Memorandum
POS/NAV	Position/navigation
PQT	Production Qualification Testing
PREPO	Prepositioned
PSYOP	Psychological Operations
PT	Personnel Transformation
PVT	Positioning, velocity and timing
PVT	Production Verification Testing
QDR	Quadrennial Defense Review
QR	Quadruple resonance
R&R	Rest and Recuperation
RC	Reserve Component
RCC	Regional Combatant Commander
RCCC	Reserve Component Coordination Council
RDA	Research, development, and acquisition
RDE	Research, Development, and Engineering
RDTE	Research, Development, Test, and Evaluation
RDT&E	Research, Development, Test, and Evaluation
REBS	Rapidly Emplaced Bridge System
REF	Rapid Equipping Force
RF	Radar frequency
RFI	Radar Frequency Interferometer
RFI	Rapid Fielding Initiative
ROK	Republic of Korea
RPG	Rocket-propelled grenade
RSCAAL	Remote Sensing Chemical Agent Alarm
RSTA	Reconnaissance, Surveillance, Target Acquisition
RTCH	Rough Terrain Container Handler
RTM	Run Time Manager

RV	Reconnaissance Vehicle
S&T	Science and technology
SAL	Semi-active laser
SAR	Synthetic Aperture Radar
SATCOM	Satellite Communications
SATS	Standard Automotive Tool Set
SBCT	Stryker Brigade Combat Team
SBIRS	Space Based Infrared System
SDD	System Development and Demonstration
SDHSS	Shallow Draft High-Speed Ship
SDS	Sorbent Decontamination System
SE Core	Synthetic Environment Core
SECDEF	Secretary of Defense
SEMA	Special Electronic Mission Aircraft
SEP	Soldier Enhancement Program
SEWS	Space Electronic Warfare System
SHORAD	Short Range Air Defense
SIAP	Single Integrated Air Picture
SICPS	Standardized Integrated Command Post System
SIDPERS-3	Standard Installation/Division Personnel System-3
SIGINT	Signals intelligence
SIGS	Synthetic Imagery Generation System
SINCGARS	Single Channel Ground and Airborne Radio System
SIRFC	Suite of Integrated Radio Frequency Countermeasures
SITREP	Single Integrated Air Picture
SJTF	Standing Joint Task Force
SKA	Skills, knowledge, and attributes
SLAMRAAM	Surface Launched Advanced Medium-Range Air-to-Air Missile
SLEP	Service Life Extension Program
SMART	Simulation and Modeling for Acquisition, Requirements and Training
SMART T	Secure Mobile Anti-Jam Reliable Tactical Terminal
SMC	Sergeant Major Course
SMDC	Space and Missile Defense Command
SMSR	Strength Management System Redesign
SOAR	Special Operations Aviation Regiment
SOCOM	Special Operations Command
SOF	Special Operations Forces
SOP	Standard operating procedures
SoS	System-of-systems
SOSA-HR	Systems Architecture Human Resource
SPG	Strategic Planning Guidance
SPORT	Soldier Portable On-System Repair Tool
SRBM	Short-range ballistic missiles
SSC	Small-scale contingency
SSF	System of Systems Framework

SSH	Secret System High
SSTOL	Super Short Takeoff and Landing
STAMIS	Standard Army Management Information System
STE	Synthetic training environment
STRAC	Standards in Training Commission
SWB	Software Blocking
SUA	Support Unit of Action
T&E	Test and evaluation
TAA	Total Army Analysis
TACSIM	Tactical Simulation
TADLP	The Army Distributed Learning Program
TADSS	Training Aids, Devices, Simulators, and Simulations
TAF	Training Analysis Facility
TAIS	Tactical Airspace Integration System
TAMO	Theater air and missile operations
TAP	The Army Plan
TARP	Training Augmentation Range Package
TBM	Theater ballistic missile
TBMCS	Theater battle management core system
TC-AIMS II	Transportation Coordinators' Automated Information for Movement System II
TEMO	Training, Exercises, and Military Operations
TENCAP	Tactical Exploitation of National Capabilities
TEP	Tactical Electric Power
TES	Tactical Exploitation System
TES-L	TES Light
THAAD	Terminal High Altitude Area Defense
THP	Take home package
THSDN	Tactical High Speed Data Network
TI	Tactical Internet
TIN	Tactical Installation and Networking
TLO	Terminal Learning Objectives
TMDE	Test, Measurement, and Diagnostics Equipment
TOA	Total Obligation Authority
TOC	Tactical operations center
TOW	Tube-Launched, Optically Tracked, Wire-Guided Missile
TPF	Total Package Fielding
TPG	Transformation Planning Guidance
TQG	Tactical Quiet Generators
TQG	TEP Tactical Quiet Generator
TRAC	TRADOC Analysis Center
TRADOC	Training and Doctrine Command
TRI-TAC	Tri-Service Tactical Communications
TSFO	Training set, fire observation
TSP	Training support package
TSS	Training Support System

TSV	Theater Support Vessel
TTP	Tactics, techniques, and procedures
TUAV	Tactical Unmanned Aerial Vehicle
TWS	Thermal Weapons Sight
UA	Unit of Action
UAAPU	Under-Armor Auxiliary Power Unit
UAV	Unmanned Aerial Vehicles
UAVS	Unmanned Aerial Vehicle System
UCAR	Unmanned Combat Armed Rotorcraft
UCP	Unified Command Plan
UE	Unit of Employment
UGVs	Unmanned Ground Vehicle
UK	United Kingdom
USAF	U.S. Air Force
USAJFKSWCS	U.S. Army John F. Kennedy Special Warfare Center and School
USAR	U.S. Army Reserve
USAREUR	United States Army, European Command
USARSO	United States Army, Southern Command
USASOC	United States Army, Special Operations Command
USF	Unit Set Fielding
USFK	U. S. Forces Korea
USJFCOM	United States Joint Forces Command
USMC	U.S. Marine Corps
USN	U.S. Navy
USSOCOM	U.S. Army Special Operations Command
UXO	Unexploded ordnance
VAA	Value Added Analysis
VTOL	Vertical takeoff and landing
WA2R2	Warfighting Alternative Analysis Requirements and Resources
WFLA	Warfighting Lens Analysis
WIN	Warfighter Information Network
WIN-T	Warfighter Information Network-Tactical
WMD	Weapons of mass destruction
WOES	Warrant Officer Education System
XML	Extensible Markup Language