WEAPON SYSTEMS 2011



AMERICA'S ARMY: THE STRENGTH OF THE NATION

DESIGN, DEVELOP, DELIVER, DOMINATE. SOLDIERS ARE THE DECISIVE EDGE.























Dear Reader:

The Army Acquisition, Logistics and Technology community is charged to perform a vital mission to **provide our Soldiers a decisive advantage in any mission by developing, acquiring, fielding, and sustaining the world's best equipment and services and leveraging technologies and capabilities to meet current and future Army needs**. Soldiers are the decisive edge. We provide them with leading-edge technologies and advanced capabilities to dominate in our current operations across the battlespace while simultaneously preparing to respond decisively to future threats.

This annual publication describes how we are accomplishing our mission and highlights our major acquisition programs. You will learn what each program is designed to achieve for our Soldiers and the program's status. Furthermore, you will learn about the contractors involved, teaming arrangements, and critical interdependencies with other programs and fielded systems. In addition, this handbook augments several key publications that characterize the strategic context for our work, including the 2010 Army Posture Statement, the 2010 Army Modernization Strategy, and our Science and Technology Master Plan.

Our comprehensive modernization program reflects an overarching vision to meet the equipping demands of our Soldiers by developing and fielding an affordable and interoperable mix of the best equipment available for success in both today's and tomorrow's full spectrum military operations. It encompasses strategic relevance, complexity, innovation, and interconnectedness of the products and systems that we are delivering to our men and women in uniform. We are also working to institutionalize wartime innovations to better enable success in today's wars while ensuring that our forces are prepared for a complex future.

America's Soldiers are our most precious resource. They are at the center of all that we accomplish and the focus of all our plans. We are dedicated to meeting their needs around the clock and around the world. As you reference this publication and learn more about the Acquisition, Logistics and Technology community and our major acquisition programs, you will understand that our top priority is to ensure America's **Soldiers are the decisive edge**. We will never let them down.

Assistant Secretary of the Army (Acquisition, Logistics and Technology) and Army Acquisition Executive





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How to Use this Book



Highlighted rectangles indicate acquisition phase

WHAT ARE SYSTEM INTERDEPENDENCIES?

The purpose of the **System** Interdependencies section is to

outline which other weapon systems or components (if any) the main system works in concert with or relies upon for its operation. This year we have broken down the interdependencies to "In this Publication," a listing of systems in this 2011 edition, and "Other Major Interdependencies," systems that are not included in this handbook.

WHAT ARE INVESTMENT COMPONENTS?

Modernization programs develop and/or procure new systems with improved warfighting capabilities.

Recapitalization programs rebuild or provide selected upgrades to currently fielded systems to ensure operational readiness and a zero-time, zero-mile system.

Maintenance programs include the repair or replacement of end items, parts, assemblies, and subassemblies that wear out or break.

WHAT ARE ACQUISITION PHASES?

Technology Development refers

to the development of a materiel solution to an identified, validated need. During this phase, the Mission Needs Statement (MNS) is approved, technology issues are considered, and possible alternatives are identified. This phase includes:

- Concept exploration
- Decision review
- Component advanced development

Engineering & Manufacturing

Development is the phase in which a system is developed, program risk is reduced, operational supportability and design feasibility are ensured, and feasibility and affordability are demonstrated. This is also the phase in which system integration, interoperability, and utility are demonstrated. It includes:

- System integration
- System demonstration
- Interim progress review

Production & Deployment achieves an operational capability that satisfies mission needs. Components of this phase are:

- Low-rate initial production
- Full-rate production decision review
- Full-rate production and deployment

Operations & Support ensures that operational support performance requirements and sustainment of systems are met in the most costeffective manner. Support varies but generally includes:

- Supply
- Maintenance
- Transportation
- Sustaining engineering
- Data management
- Configuration management
- Manpower
- Personnel
- Training
- Habitability
- Survivability
- Safety, Information technology supportability
- Environmental management functions

Because the Army is spiraling technology to the troops as soon as it is feasible, some programs and systems may be in all four phases at the same time. Mature programs are often only in one phase, such as operations and support, while newer systems are only in concept and technology development.

For additional information and definitions of these categories and terms, please see the Glossary.



THE AMERICAN SOLDIER IS OUR PRIORITY AND MOST PRECIOUS ASSET...

Cump!

ASA (ALT)

MISSION

Provide our Soldiers a decisive advantage in any mission by developing, acquiring, fielding, and sustaining the world's best equipment and services and leveraging technologies and capabilities to meet current and future Army needs.

VISION

A highly innovative organization of dedicated professionals transforming the Army with integrated Acquisition, Logistics, and Technology capabilities to provide Soldiers a decisive advantage and win our nation's wars!

STRATEGIC CONTEXT

We face a global security environment characterized by persistent conflict against enemies determined to disrupt our Soldiers' mission. Our goal is to do everything we can to provide the best equipment deliver Soldiers to the battlefield for a range of missions. They need the fire and maneuver capabilities that allow them to communicate, engage, and disengage. Our troops must continue to operate with confidence in their equipment, operational capabilities, communication, enhanced situational awareness, and force protection. We want our Soldiers to return from every operation and engagement.

Modernizing the Army will help to counter rapidly emerging threats that change the nature of battlefield operations. This is accomplished by capturing lessons learned from the range of combat to include close combat and improved explosive devices (IEDs). The Army must develop and field new capabilities or sustain, improve, or divest current systems based on operational value, capabilities shortfalls, and available resources. These decisions are based on the principles identified in the Army's Modernization and Equipping Strategies and are influenced by the results of detailed deliberations within the Army's maturing Capability Portfolio Reviews (CPRs). These, in turn, will be influenced by the requirement for Operational Adaptability contained in the 2010 Army Operating Concept.

Decentralized operations are required within the context of Mission Command. The complex and uncertain strategic environment dictates the need for capabilities and weapon systems that provide the essential qualities of adaptability and versatility, to operate in current and future environments across the spectrum of conflict. Lessons learned from the current operating environment and a capability-based assessment highlight that some current capabilities do not adequately counter the current threats and lack the capability needed to adequately meet the operational requirements of future warfighting concepts and threats.



SOLDIERS ARE THE DECISIVE EDGE

The Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA (ALT)) is deeply invested in developing, delivering and sustaining the best weapons technology available to assist Soldiers in executing the myriad of operational requirements in a fluid and volatile strategic environment. With the Soldier as the key focus, ASA (ALT) seeks to equip Soldiers with the best in cutting-edge technology and effectively manage up to 650 programs that are vital to success in combat. ASA (ALT)'s focus is closely aligned with the Army Modernization Strategy, which outlines a series of key goals—such as the continued development of new technologies engineered to provide Soldiers with the decisive edge in battle. These technologies in development span a range of new capability to include robots, sensors, Unmanned Aircraft Systems (UAS), missiles and missile guidance systems, emerging combat platforms such as the Ground Combat Vehicle, and key technologies such as the Army's maturing network, designed to connect Soldiers, sensors, and multiple nodes to one another in real-time to improve operational effectiveness across the full spectrum of combat operations.

At the same time, the modernization strategy places a premium on finding affordable solutions, finding and applying efficiencies designed to maximize the value of dollars spent on development, and more rapidly delivering greater technological capability within an increasingly constrained fiscal environment. To this end, the Army is developing an Affordable Modernization Strategy that seeks to develop needed systems with a mind to budgetary responsibility. Part of this involves synchronizing and integrating programs, platforms, and systems in relation to one another from a system-of-systems point of view in order to maximize interoperability, reduce redundancy, and prioritize an acquisition strategy which correctly organizes and develops technologies as interconnected systems.

UNITED STATES ARMY

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- ASA (ALT) is working vigorously to implement guidance from Defense Secretary Robert Gates, which calls upon the services to sustain current force structure and needed modernization by achieving two to three percent real growth. The current and planned base defense budget has steady but modest growth of one percent per year, necessitating innovative processes and doing more, without more.
- To make up the difference and preclude reductions in needed military capability, the difference of one to two percent per year will be made up elsewhere across the Department of Defense and the services. The goal is to significantly reduce excess overhead costs and apply savings to force structure and modernization.
- Part of this effort includes the application of Lean Six Sigma methodologies and Continuous Process Improvement guidelines.

Part of this modernization process—emphasizing this system-of-systems engineering and validation of corerequired capabilities—hinges upon the results of the Army's **Capability Portfolio Reviews (CPRs)**. These CPRs have taken up a detailed examination of groups of technologies and systems from a portfolio perspective with a mind to perceiving how they relate to one another and the full capability perspective of the operating force. A key emphasis of the CPRs is to identify areas where efficiencies can be increased and redundancies can be eliminated. The reviews are grounded in the reality that the defense budget will not increase nor be sustained at the levels it has in recent years, therefore ushering in an anticipated more constrained budget environment in coming years. The CPRs include Aviation, Network, Radios, Precision Fires, Air and Missile Defense, Tactical Wheeled Vehicles, Combat Vehicle Modernization, Soldier Systems, Engineer Mobility/Countermobility, Intelligence Surveillance Reconnaissance (ISR), Training Ammunition, Software/Hardware, and Watercraft.

The CPRs are also aimed at informing the Army's overarching investment strategy that seeks to effectively manage taxpayer dollars with a mind to providing the best technologies to our Soldiers while maintaining affordability. For instance, the Precision Fires CPR determined that the Army no longer has a need to develop the Non-Line-of-Sight Launch System (NLOS-LS) because it already has similar capabilities in its arsenal. As a result of the CPR, the requirement for the NLOS-LS was cancelled in an effort to remove redundancy while still developing the best capabilities for Soldiers in combat.

The goal of the CPRs is to make the best use of investment dollars and continue to serve Soldiers while being responsible stewards of taxpayer money and constrained National resources.



ENABLING ARMY MODERNIZATION SO OUR SOLDIERS DOMINATE TODAY AND TOMORROW

ASA (ALT) is developing technologies with a specific mind to the ever-changing contingencies in today's combat environment. Soldiers are the decisive edge in a wide range of potential conflict scenarios ranging from peacekeeping and nation building to fighting conventional, irregular, or hybrid enemies. Army Doctrine calls upon the force to be prepared for what is called full-spectrum operations, meaning they must be equipped for all potential scenarios to include high-, medium-, and low-intensity conflict. The Army's acquisition strategy and weapons platforms seek to accommodate this operational reality and prepare Soldiers to be adaptive to an entire range of potential operations. For this reason, acquisition processes need to be synchronized with the requirements process to best identify needs and capability gaps experienced by Soldiers in battle today; ASA (ALT) will continue to work closely with the Army's Training and Doctrine Command (TRADOC) to ensure that the requirements development process is deeply interwoven with weapons systems modernization. There are times when systems in development need to change, adjust, and tailor their requirements to meet with current capabilities and urgent needs coming from combatant commanders in theater. This process is one that requires continuous evaluation and reassessment throughout the weapons system development process.

Also for this reason, the Army's acquisition strategy is designed to be tailorable to changing threats. The Army seeks to train, develop and equip Soldiers who are able to stay in front of an adaptive, fast-changing adversary. By emphasizing the best design, delivery, and sustainment of Army equipment, ASA (ALT) will remain focused on harnessing scientific innovations in order to identify and develop the most promising new technologies.





UNITED STATES ARMY

THE ARMY MODERNIZATION STRATEGY

ASA (ALT) seeks to ensure that America's Army is the world's preeminent land power by equipping and sustaining Soldiers in a timely and responsible fashion with the best technologies available. The Army's Modernization Strategy is squarely aimed at accomplishing this goal; ASA (ALT) is constantly working to identify and develop emerging technologies that have the potential to strengthen Soldiers. As a result, continued scientific and technological innovation is a constant Army focus; the Army works to preserve and build upon its relationships with its partners in academia and industry designed to enhance the learning curve and advance technology for the benefit of Soldiers. A key focus of the modernization effort is the need to prepare Soldiers for the fast pace of change on today's battlefield by keeping abreast of the latest in scientific discovery.

A centerpiece of this strategy is the recognition that many of the systems in this handbook are interdependent, meaning they rely upon and reinforce one another. For this reason, ASA (ALT) approaches acquisition from a system-of-systems point of view that places a premium upon looking at how technologies work in tandem as part of a larger system. Modernization and development of new capability must accommodate this system-of-systems approach.

INTEGRATING THE BRIGADE COMBAT TEAM

Part of the Army's modernization effort hinges upon its continued transformation from the Cold War division structure to smaller, deployable Brigade Combat Teams (BCTs); as part of its modular design approach, the Army is moving toward a force structure which identifies units as BCTs—designed and composed as they are prepared to deploy. Described as part of the Army Force Generation (ARFORGEN) cycle, the BCTs are identified as effective combat units to be modernized.

To this end, the Army is preparing a series of new technologies for its Infantry Brigade Combat Teams equipping them with robots, sensors and UAS systems all networked together using software programmable radio and satellite technologies. The idea is for the dismounted Soldier—the centerpiece of Army modernization—to have the ability to share more information faster, further and more efficiently across the force in real-time using new sensors and network technology.

Early Infantry Brigade Combat Team (E-IBCT) modernization is a term identifying the Army's emphasis on BCT transformation; using the battlefield network as its core, E-IBCT technologies will provide Soldiers with an unprecedented battlefield connectivity. E-IBCT technologies, which include the Small Unmanned Ground Vehicle (SUGV) robot, the Class I UAS, the Urban and Tactical Unattended Ground Sensors, and the first increment of the Army's network are slated to deploy with forces in 2011.

THE NETWORK AS THE CENTERPIECE OF ARMY MODERNIZATION



The idea of the Army network is to connect multiple echelons and be able to move information from the dismounted Soldier on the tactical edge, up to the platoon and company level, and all the way up to higher headquarters. The information travels through a terrestrial network able to send voice, video, data, and imagery through Joint Tactical Radio Systems (JTRS) software programmable radios using high bandwidth waveforms such as Soldier Radio Waveform (SRW) and Wideband Networking Waveform (WNW). Information sent and received by the terrestrial layer is connected to Warfighter Information Network–Tactical (WIN-T), a satellite network able to send information over long distances using fixed nodes as well as vehicles on-the-move.

The Army's "network" can use the terrestrial layer in addition to beyond line-of-sight satellite connections; the line-of-sight radio connections can be extended through use of an aerial tier which places Rifleman Radios on aircraft such as UH-60 Black Hawks, AH-64 Apaches and Shadow UAS. With the aerial tier, units do not have to place a relay team on the top of a mountain ridge or reposition a command post to ensure communication between ground units over extended distances.

For instance, the Army's network will make it possible for Soldiers in a vehicle on-the-move to view and share real-time feeds from a nearby robot, ground sensor, or UAS—instantaneously providing them combat-relevant information and enabling them to share that information with other units on the move, dismounted Soldiers, and higher echelons of the force.

MRAP FORCE PROTECTION SAVING LIVES

Part of this equation involves continued investment in proven technologies such as Mine Resistant Ambush Protected (MRAP) vehicles. MRAPs are engineered with a blast-debris deflecting V-shaped hull and an armored capsule to protect Soldiers from roadside bombs and IEDs. The MRAPs, and the lighter weight, more mobile MRAP All Terrain Vehicles (M-ATV) have proven their ability to save Soldiers' lives in combat.

As a result of their performance in battle and proven value to Soldiers, MRAPs will remain a vital part of the Army's Tactical Wheeled Vehicle fleet for years to come. MRAPs will be assigned to specific BCTs so that they are available to perform key functions such as route clearance and Soldier transportation when needed.

Also, MRAPs have been outfitted with Network Integration Kits (NIK)—giving them the latest in Army networking technology. Using software-programmable radio such as JTRS and satellite technology such as WIN-T, the networked MRAPs are able to share realtime information such as sensor feeds from nearby robots and UAS across the force while on the move. This new capability—validated in technical field tests and network exercises—connects units at the battalion and company levels and below to one another and to higher headquarters in real-time using the NIKs and Force XXI Battle Command Brigade and Below (FBCB2) display screens.

MRAPs and other vehicles in the Army fleet will take advantage of lighter weight armor composites as they become available. The Army Research Laboratory is testing combinations of materials which can outperform traditional steel at a much lighter weight; these technologies will spin out into the force as they become available.

"The Network is the singularly most important program to the Army."

GENERAL GEORGE W. CASEY, JR. U.S. ARMY CHIEF OF STAFF



A prime example of the search for efficiencies within major programs, the Department of Defense, Army, and Marine Corps have succeeded in achieving a \$2 billion cost avoidance on the MRAP program by applying systems engineering techniques and Lean Six Sigma practices to the program. The thrust of the cost avoidance was achieved through several key methodologies; MRAP program managers streamlined and coordinated the requirements process to better determine which vehicles to upgrade and developed a database portal aimed at sharing key information across the 25,000-strong fleet of vehicles.

JLTV DEVELOPMENT: PERFORMANCE, PROTECTION, AND PAYLOAD

The Joint Light Tactical Vehicle, or JLTV, Technology Development phase industry teams have built government prototypes, engineering an unprecedented blend of mobility, payload capacity, and survivability building a light tactical vehicle that will withstand IED attacks, drive quickly through diverse terrain, and transport beneath a CH-47 or CH-53 helicopter.

The Army-Marine Corps JLTV program will produce a new fleet of tactical vehicles that can support a range of mission sets. The Army is developing a family of JLTV vehicles and companion trailers that can be used in any operational environment—low- to high-intensity conflict, major combat operations, or hybrid warfare. Following a Milestone C decision in 2013, the Army plans to purchase 55,000 JLTVs and the Marines plan to buy 5,500. Full production is slated for 2015. Currently, there are three payload categories that cover ten JLTV configurations. Category A, the smallest category, will have a combat transport weight of 14,322 pounds and supports a 3,500-pound payload while armored. Category B is somewhat larger, supporting a 4,500-pound payload while armored; Category C supports a 5,100-pound payload while armored. The Category C vehicles will also address shelter and ambulance requirements. The entire JLTV family is transportable by tactical assets (CH-47, CH-53, C-130), greatly reducing the burden on strategic assets such as the limited quantity of C-17 and C-5 aircraft.

Other requirements include building a vehicle that can generate 30 kilowatts of exportable power, drive when tires are shot, accommodate scalable armor solutions and extra spall liner, and embedded diagnostics.



PAVING THE WAY FOR THE GROUND COMBAT VEHICLE

The Army plans to develop, design, build, and deploy a Ground Combat Vehicle Infantry Fighting Vehicle (IFV) as a centerpiece of its combat vehicle modernization strategy. The Army requires an IFV that can deliver a squad to the battlefield in a full-spectrum environment under armor. No single vehicle available today can provide the necessary combination of capabilities planned for the Ground Combat Vehicle. Plans for the vehicle include development of a system that has abilities equivalent to or surpassing the mobility of the Stryker and the protection of an MRAP.

Based on lessons learned in over eight years of war, the Army has confirmed that the existing fleets, including the Bradley IFV, cannot provide the needed combination of space, weight and power, advanced force protection, and mobility needed to prevail in 21st century fullspectrum environments.

The Ground Combat Vehicle will be able to maneuver in urban environments, withstand IED attacks, and house the state of-the-art in vehicle computing technology—all while delivering a squad to the battlefield under the best armor protection available.

> "If we are to preserve the Army that we have built so painstakingly over the last eight years, we, the civilians and military leadership of the Department, must fundamentally change the way we do business."

GENERAL GEORGE W. CASEY, JR. U.S. ARMY CHIEF OF STAFF

TRANSFORMING ARMY ACQUISITION AND BUSINESS PRACTICES

The Army remains sharply focused on finding ways to continually examine and improve the acquisition process with a mind to increasing efficiency. This approach includes a new, 120-day, Secretary of the Army-directed Army Acquisition Review, designed to take up and evaluate the entire range of acquisition practices to included funding, policy, processes, and major programs.

In addition, the Army is emphasizing Lean Six Sigma business practices in many of its programs. These are specific, business-proven methods aimed at finding way to streamline productivity and reduce overhead costs. Applying these methods recently resulted in a \$2 billion cost avoidance on the MRAP program because program managers found ways to consolidate and streamline vehicle upgrade requirements.

A system-of-systems approach is vital to these ongoing efforts to transform business practices; the Army must look at developing, managing, and acquiring technologies in the most efficient way possible, an approach which includes the need to understand the interdependencies between systems. There must be an emphasis upon maturing the capability to synchronize programs and integrate schedules, deliveries, and other developments across the acquisition process.

As a result of these and other practices, the acquisition community remains acutely aware of its need to further the transformation of its business efforts. These initiatives help the Army transform as an institution and ensure that the service provides the best value possible for the taxpayer and the Soldier—who is at the very center of these efforts.

COMMUNICATING AND COLLABORATING WITH INDUSTRY

The Army must continue to foster, harness, and develop its relationships with vital industry partners as a way to ensure the best possible development of new and emerging systems. With this as an organizing principle, ASA (ALT) has created a new industry outreach engagement program squarely focused on furthering partnerships with industry and facilitating constructive dialogue designed to achieve the best results for Soldiers in combat. Recognizing the importance of revitalizing industry engagement, the Army continues to nurture this outreach program, fostering and preserving strong relationships between the Army and its vital industry partners.

Recognizing that there are often circumstances where procurement sensitivities and ongoing competition may preclude the occasion to dialogue with industry about certain topics, there are nonetheless ample opportunities for positive, proactive, and constructive engagement with industry partners. While placing a premium upon the importance of properly defining the parameters for discussion with industry partners, ASA (ALT) seeks to foster an environment of open dialogue. ASA (ALT) recently embarked upon a revitalized industry engagement program that brings leaders of industry together with key Army decision-makers in an effort to facilitate open and worthwhile conversations; both the Army and its industry partners stand to benefit from such an arrangement that recognizes the importance of proactive engagement. The rationale behind such an approach is grounded in the effort to minimize misunderstandings and "eleventh hour" reactions. This industry program is squarely aimed at working to anticipate future developments, recognizing and communicating industry trends, and identifying the evolution of key technologies that are maturing to the point where they can help Soldiers in combat.

ELIMINATING CHEMICAL WEAPONS

Achieving excellence in acquisition involves continuous stewardship and superb management of highly sensitive and visible programs for which ASA (ALT) has executive agent authority, such as the Nation's chemical weapons disposal program.

The U.S. Army Chemical Materials Agency (CMA), using acquisition processes as its baseline, works with private industry, academia, and other interested policy and environmental stakeholders to eliminate America's obsolete chemical weapons.

Overall, CMA has destroyed 78 percent of the nation's obsolete chemical weapons stockpile and anticipates that it will reach 90 percent destruction by 2012.

CMA also responds to discoveries of non-stockpile chemical weapons and safely stores those weapons until their disposal. Moreover, CMA partners with the Federal Emergency Management Agency to prepare local communities to deal with potential emergencies involving those weapons.







PATH FORWARD

The Army is preparing for a strategic environment characterized by persistent conflict and the resilience of ruthless, determined, and adaptive adversaries. These challenges form the basis of our requirement to modernize. Continuous modernization is key to transforming Army capabilities and maintaining a technological advantage over our adversaries across the full spectrum of conflict. ASA (ALT) has received extraordinary funding support through wartime Overseas Contingency Operations funds, but they have only enabled us to sustain the current fight. ASA (ALT) looks forward to continued Congressional support to achieve its broad modernization goals.

The systems listed in this book are not isolated, individual products. Rather, they are part of an integrated system-ofsystems investment approach designed to make the Army of the future able to deal successfully with the challenges it will face. Each system and capability is important. These systems represent today's investment in tomorrow's security—to ensure our Army successfully defends our Nation.

WEAPON SYSTEMS

LISTED IN ALPHABETICAL ORDER