# Air Force Strategic Plan Volume 3

## Long-Range Planning Guidance

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# Foreword

As an Aerospace Nation, the United States remains committed to ensuring it remains the preeminent aerospace power of the 21st century. Our recent update to the *Air Force Vision* flows from the *Joint Vision* and the *National Security Strategy* and represents our continuing commitment to providing the Nation with the aerospace capabilities required to maintain our preeminence. Our Vision is grounded in *Joint Vision 2020*, which expresses the authoritative joint vision of how we will deter, fight, and win future engagements. Furthermore, the Air Force Vision embodies our belief that aerospace power will be the Nation's strategic instrument of choice in the 21st century.

The *Air Force Strategic Plan* (AFSP) puts our Vision 2020, *America's Air Force: Global Vigilance, Reach and Power,* into action. Published in three interrelated volumes, the AFSP provides guidance and alignment for strategic planning at all levels of the Air Force. Volume 3 of the AFSP, *Long-Range Planning Guidance* (LRPG), charts the path of change for Air Force capabilities, people, infrastructure, and innovation. Its "Critical Future Capabilities" identify opportunities the Air Force must pursue to achieve our Vision. The LRPG is authoritative guidance that will influence modernization planning and programming decisions via the *Annual Planning and Programming Guidance* and assist realistic investment strategy planning through the *Air Force Program Projection*. The LRPG will also help define the Air Force's posture for the next Quadrennial Defense Review.

As the steward of our Nation's aerospace capabilities, it is the Air Force's responsibility to build and sustain an aerospace force capable of meeting the future joint warfighting needs of our Nation. By using the LRPG to realize the Air Force Vision, we will ensure that the United States continues to maintain the world's most effective aerospace force in the 21st century.

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General, USAF
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Secretary of the Air Force

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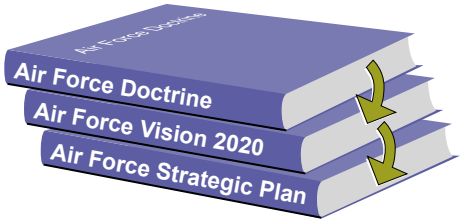
# Introduction

America is an Aerospace Nation. Our preeminent aerospace power is increasingly called upon as America's strategic weapon of choice. We see no changes to this approach in the near future. As stewards of America's aerospace power, we look to our Doctrine, our Vision, and our Strategic Plan to ensure that we can, and will, supply our Nation the aerospace power it needs.




**Air Force Doctrine** presents the guiding principles of our Air Force. It draws together lessons of our history and experience and provides the Nation's aerospace force with a common understanding of the way we prepare for, plan, and conduct aerospace operations. As our experience in aerospace warfare has evolved, we have developed Core Competencies to provide insight into the specific capabilities the Air Force must bring to activities across the range of military operations. The combination of our doctrinal principles, tenets, and Core Competencies provides guidance for the application of aerospace forces throughout the full range of joint and coalition operations. Our Doctrine is consistent with and complementary to Joint Doctrine. Doctrine forms the basis for Joint Forces Air Component Commanders (JFACC) to plan and execute assigned aerospace missions as a component of joint and coalition forces.

**Our Vision** guides adjustments to Doctrine and takes the Air Force into the future by charting a course from the near-term to the long-term. Senior Air Force leaders furnish the overarching themes that shape the Air Force Vision to guide the evolution of our aerospace force over the next 15 to 20 years. The Vision describes the context of our Air Force Core Competencies, which are the building blocks for the enduring contributions aerospace power brings to the United States. The Vision describes the interdependence of our Core Competencies and how they deliver Global Vigilance, Global Reach, and Global Power to the Nation and joint force commanders.

The **Air Force Strategic Plan** (AFSP) establishes the guidance to ensure that near-term, mid-term, and long-term planning and programming move the Air Force toward achieving the Vision. In essence, it provides the broad framework to develop the structures and capabilities of the 21st century Aerospace Force.

The AFSP contains three volumes—Volume 1, *The Future Security Environment*; Volume 2, *Performance Plan*; and Volume 3, *Long-Range Planning Guidance*. In addition, the *Air Force Program Projection* (AFPP) and *Annual Planning and Programming Guidance* (APPG) result from the AFSP.

Volume 1, *The Future Security Environment*, describes security challenges and emergent trends the Air Force expects to face through the first quarter of the 21st century. To this environment, Volume 3 adds long-range planning guidance for the Critical Future Capabilities (CFC) the Air Force will pursue. Volume 1 is updated as required.

Volume 2, *Performance Plan*, focuses on measuring and improving our *current* operational performance. It defines Headquarters Air Force mission-essential tasks, performance measures, and standards to improve organizational performance. As the Vision changes, our day-to-day operations adjust accordingly. Volume 2 guides development of current performance measures at Air Force, Major Command (MAJCOM), and Wing levels to ensure near-term planning results in effective and efficient operational capabilities. These performance measures form the baseline from which we can gauge today's performance, focusing on achieving tomorrow's capabilities described in Volume 3. As the Air Force planning process continues to mature, Volume 2 will provide the

feedback products and data to Air Force planners. Using this information to identify and pursue Critical Future Capabilities, planners and the Air Force at large continually move toward achieving the Vision. Volume 2 is updated every 2 years, or as necessary.

Volume 3, *Long-Range Planning Guidance*, uses the security environment discussed in Volume 1 and the shortfalls identified through the Volume 2 process as inputs to establish Critical Future Capabilities. Volume 3 also incorporates broad tenets of guidance documents such as the National Military Strategy (shape, respond, prepare), Joint Vision 2020 (full spectrum dominance), Air Force Doctrine, and Air Force Vision 2020 (global vigilance, reach, power), translating them into actionable elements. Its goal is to define the set of essential capabilities that will "drive modernization planning" to realize the Vision and ensure the United States remains the premier Aerospace Nation. Volume 3 will be reviewed and updated annually.

The AFPP captures MAJCOM modernization plans and packages them as the corporately approved Air Force position on out-year modernization investment. A companion to Volume 3, the AFPP tracks major modifications of weapon systems, as well as new capabilities, to ensure MAJCOM submissions are in concert with the direction of the Vision. The AFPP combines capital investment and Operations and Support programs to provide an Air Force projection of out-year expenditures. It develops a realistic, fiscally bound, and executable projection of Air Force modernization programs. The AFPP identifies issues that require study and analysis before major investment decisions are made. The decisions made, based on the AFPP, will be reflected in the APPG, with the funding streams associated with those decisions becoming Program Objective Memorandum (POM) decisions. The AFPP represents an integrated Air Force approach to achieving the Critical Future Capabilities identified in Volume 3. In this first cycle, the Critical Future Capabilities are associated with the core competency funding areas within the AFPP that they represent. Future iterations of both Volume 3 and the AFPP will strengthen this relationship. Ultimately, the path laid out in the AFPP will move the Air Force toward achieving these capability goals. This initial version of Volume 3 and the FY01–17 AFPP are the first steps to achieving this end. A summary of the AFPP is included in the APPG as an appendix. The AFPP is updated annually.

The APPG *links* Air Force planning with programming as it shapes the future aerospace force. The APPG is developed using modernization plans and AFPP inputs. The objective of the APPG is to ensure the appropriate financial resources are allocated to transform the Vision into operational reality. This transformation must maintain a balance between preparing the Air Force to respond to today's demand and shaping it for tomorrow's likely opportunities and challenges. Consequently, the APPG addresses directed funding, funding to maintain force structure to meet national requirements, and initiatives. The APPG is realistic, fiscally bound, and executable guidance, resulting from AFPP decisions and senior leadership direction. It frames the debate on resources, which occurs through the Air Force corporate structure during the POM build. Finally, it addresses outstanding planning issues for study and analysis that must be resolved prior to future POMs and Amended POMs. The APPG is updated annually.

The challenge of fully synchronizing strategic planning, performance planning, modernization planning, and POM building is an ongoing effort. This inaugural Volume 3, along with its companion documents, the AFPP and APPG, represents a major step in the evolutionary effort to strengthen the Air Force strategic planning process. The goal of subsequent editions of Volume 3 is to provide greater specificity and prioritization to all Air Force planning activities. This specificity and prioritization will require enhanced analytical capability to identify, assess, and guide trade-off decisions. As the required analytical capability and associated support tools mature, the level of detail and prioritization in Volume 3 will increase. The volume will remain focused on supporting the Core Competencies, achieving the Air Force Vision, and creating appropriate doctrinal change.

# Purpose

## Realizing the Vision through Critical Future Capabilities

AFSP, Volume 3, *Long-Range Planning Guidance* captures senior leadership guidance on major force modernization and investment strategies that are essential to achieving the Air Force Vision and adjusting doctrine. It does this by identifying **Critical Future Capabilities** the Air Force must *supply* to meet anticipated future demands. Organized around Air Force Core Competencies and Core Competency Support Areas, Volume 3 directly supports the Air Force Vision and doctrine. As the Air Force's *Long-Range Planning Guidance*, Volume 3 will help foster the integration of air and space capabilities that will move us toward a seamless, full-spectrum aerospace force. To this end, the Critical Future Capabilities provide strategic focus to simulation and wargaming efforts including Global Engagement, Aerospace Future Capabilities Game, and the Joint Expeditionary Force Experiment (JEFX) efforts. Volume 3 also guides long-term science and technology and experimentation investment by identifying promising concepts and high-leverage opportunities. In its entirety, Volume 3 identifies key Air Force priorities for future force structure development and investment and provides front-end guidance to the Modernization Planning Process (MPP).

Critical Future Capabilities are essential components of the long-range planning process, which develops and resolves strategic issues collaboratively between HQ USAF, MAJCOM, and Field Operating Agency (FOA) strategic planners. Volume 3 presents coordinated Air Force Board of Directors (BoD) positions with CSAF and SECAF approval. Accordingly, Volume 3 guides the planning, requirements, acquisition, and programming processes at all levels.

## Realizing the Vision through Innovation and Adaptation

The Air Force is committed to leadership in innovation and adaptation—this is our heritage and vital to ensuring our future contributions to the Nation. To realize the Air Force Vision, the strategic planning process must drive innovation and adaptation.

The rate of technological change has accelerated dramatically around the world. In light of this evolution, our future aerospace force must do what is necessary to maintain its military edge and to preserve aerospace power as our asymmetric advantage. The Air Force Vision establishes that we are by our very nature an innovative, adaptive force. We will continue exploring both science and technology and operational concepts, identifying those ideas that potentially offer evolutionary and revolutionary increases in capability. We are committed to a vigorous program of researching, experimenting, testing, exercising, and evaluating new operational concepts and future systems to enhance aerospace power. Moreover, we recognize that creative and innovative people, as well as the requisite institutional commitment, are the foundations for success of the future Air Force.

# Essential Documents

## National Strategy

The *National Security Strategy* and *National Military Strategy* play a significant role in shaping Volume 3. The military is one of four instruments (Diplomatic, Economic, Military, and Information) of United States national power and statesmanship in peace, crisis, and war. The military constitutes a set of capabilities that gives the national leadership a range of viable options for promoting and protecting our national interests. These capabilities must be tailored to meet U.S. strategic goals and objectives, particularly those related to preserving the security of the Nation. The first step in Air Force planning for future capabilities is to determine what the Nation's goals and objectives will demand of Air Force capabilities, people, infrastructure, and innovation. The second step is to assess what shortfalls in planned and programmed capabilities need to be addressed as the Air Force organizes, trains, equips, and provides forces to carry out its functions in support of joint missions. The national strategy is discussed in detail in Appendix A of Volume 3.

## Air Force Basic Doctrine, Air Force Vision, Air Force Posture Statement

*Air Force Basic Doctrine*, AFDD 1, stresses the reliance on Core Competencies as the building blocks of our doctrine. They are at the heart of our strategic perspective and the service's contribution to the Nation's total military capabilities.

*Air Force Vision 2020* is the foundation of Volume 3. It states that through mastery of the aerospace domain, we provide joint forces freedom from attack, freedom to maneuver, and freedom to attack. We achieve this Vision by mastering our Core Competencies: Aerospace Superiority, Global Attack, Rapid Global Mobility, Precision Engagement, Information Superiority, and Agile Combat Support.

Volume 3 is in concert with *Air Force Posture Statement 2000* because both documents highlight Air Force Core Competencies as a foundation. Additionally, the posture statement expresses a commitment to maintain and improve the Air Force's ability to achieve future Full Spectrum Dominance. This is the primary objective of the Air Force modernization program. Accordingly, everything we do in joint and coalition military operations requires control of air, space, and information; and, without the full spectrum dominance of aerospace power, our joint forces could not effectively deploy, fight, or win.

## Future Security Environment

Volume 1, *The Future Security Environment*, is a cornerstone of Volume 3. It identifies the geostrategic environment the Air Force will likely face in the next 25 to 30 years. It also outlines a series of assumptions (or working propositions) that provide the strategic direction needed to develop our Critical Future Capabilities.

Volume 1 attempts to identify those political, economic, and social trends that may affect future Air Force efficiency and effectiveness. These trends include economic globalization, along with local political disintegration, urbanization, and the growth of influential city-states; the growing commercialization of space; and other similar developments. Volume 1 also identifies military and strategic trends that will shape a global environment increasingly characterized by regional and non-state actors that use asymmetric strategies in nontraditional domains.

The spread of war, or war-like effects, into new domains has obvious implications for Air Force planning. Volume 1 answers this challenge by providing a series of planning assumptions for the future, including the belief that we will continue to support a proactive national security

strategy. Volume 1 then weaves the need for particular joint and Air Force competencies or capabilities into the fabric of these assumptions. The Air Force must fully realize its Core Competencies in order to protect forces that deploy to theater; it must protect the United States' advantages in air and space; and it must be able to conduct rapid, long-range operations, among many other responsibilities. Volume 1 identifies, in broad terms, the demanding environment that our Air Force must address in a post-Cold War world. Volume 3 then provides the direction and capabilities needed to address the future security environment and to remain the preeminent Aerospace Nation.

# Guidance

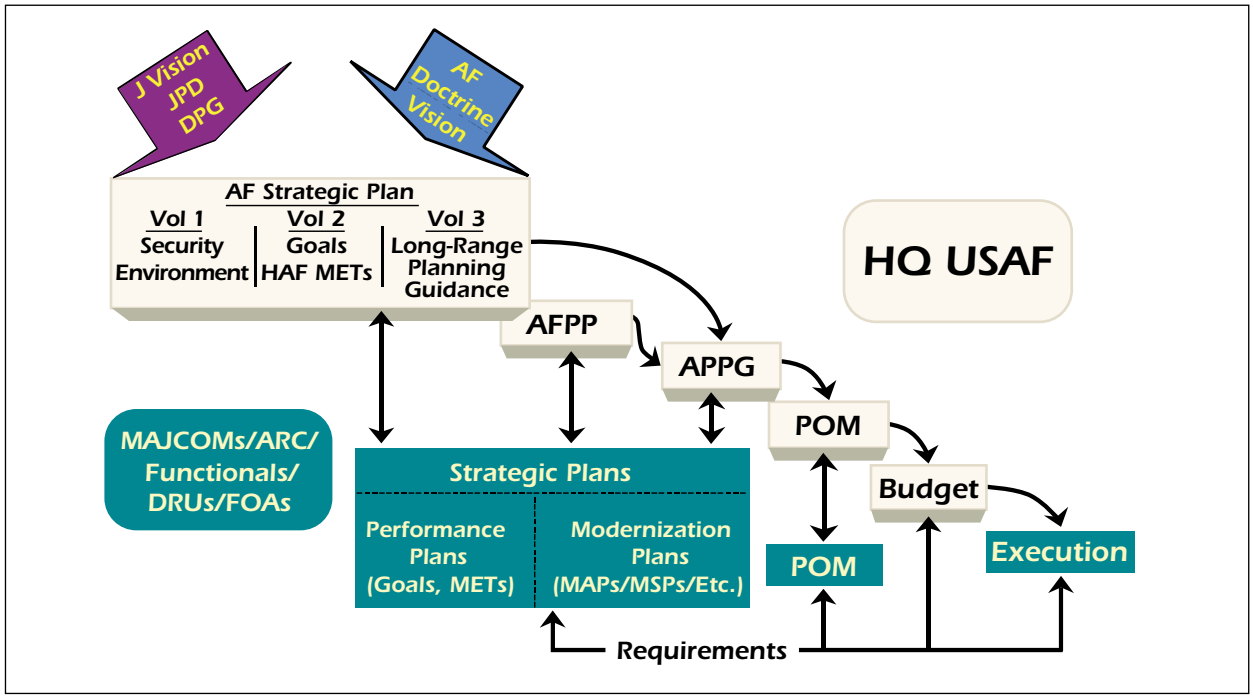
## Air Force Planners

Planners throughout the Air Force will use Volume 3 as authoritative guidance, as it designates future capabilities that planners must achieve to realize the Vision. The guidance contained in Volume 3 is purposefully broad and overarching and serves as a "capstone" for a decentralized Air Force strategic planning process. Volume 3 does not of itself lay out a specific plan, but serves as a guidepost for specific and detailed MAJCOM and Functional plans. As such, the total Air Force Strategic Plan is a combination of AFSP, Volumes 1–3, and the specific lower echelon plans. This decentralized approach to executing modernization planning allows planners throughout the Air Force to develop specific methods of modernization to fit their particular needs.

Air Force planners should take into account both materiel and non-materiel innovations in planning for achieving Critical Future Capabilities. The primary focus of modernization planning at the MAJCOM/FOA level is to maintain and improve Air Force capabilities across a 25-year time frame. The financial and programmatic information from MAJCOM, Functional, and DRU Mission Area Plans (MAP) and Mission Support Plans (MSP) provides the basis for the AFPP.

The capabilities listed in Volume 3 do not represent the entire breadth of capabilities the Air Force should pursue but only those capabilities deemed most critical. *To address the comprehensive needs of the future Air Force, MAJCOM plans can and should encompass many capabilities not specifically addressed in Volume 3*.

The MPP fits well within the overall Air Force strategic planning process that establishes an overarching framework to guide performance planning and modernization planning at all echelons of the Air Force. The result of these *interlinked* planning processes is a series of coordinated and integrated "cascading effects"



that begin with Air Force Doctrine, the Vision, and the Strategic Plan. Figure 1 illustrates fundamental relationships among essential elements of the Air Force planning system.

## Air Force Science and Technology and Experimentation Communities

U.S. superiority in Innovation and Science and Technology (S&T) will continue as a cornerstone of our national military strategy. In support of this strategy, the Air Force remains committed to leading the way, using a vigorous program of research, experimentation, gaming, testing, exercising, and evaluating new aerospace operational concepts and systems. The Air Force Vision espouses the role of Air Force leadership in technology and innovation, and Volume 3 provides guidance to the S&T and experimentation communities to support that position. The Air Force Chief Scientist; Commander, Air Force Materiel Command; and Commander, Air Force Research Laboratory are responsible for providing the analysis and technical recommendations included in the enabling technology initiatives. The S&T community will use Volume 3 as a guiding document in the development of their S&T roadmap and investment strategies. The experimentation community is composed of the Air Force Experimentation Office (JEFX); HQ USAF/XOCW (Wargaming, Experimentation, and Advanced Concept Technology Demonstrations); Air Force Agency for Modeling and Simulation; HQ USAF/XPXC (Wargaming); Air Force Studies and Analysis Agency; and Air Force Battlelabs. This community will use Volume 3 as the strategic-level guiding document for evaluating emerging technologies and new operational concepts and for developing their planning documents.

Because innovation and S&T are so important to the future of the Air Force, each capability statement includes some specific enabling technologies that should be pursued to bring about the desired changes that will make that capability a reality. In addition to the technologies identified, new operational concepts and processes may allow us to better leverage existing and emerging technologies to achieve the critical operational capabilities. Therefore, technology and operational innovation are the underpinnings of each Critical Future Capability.

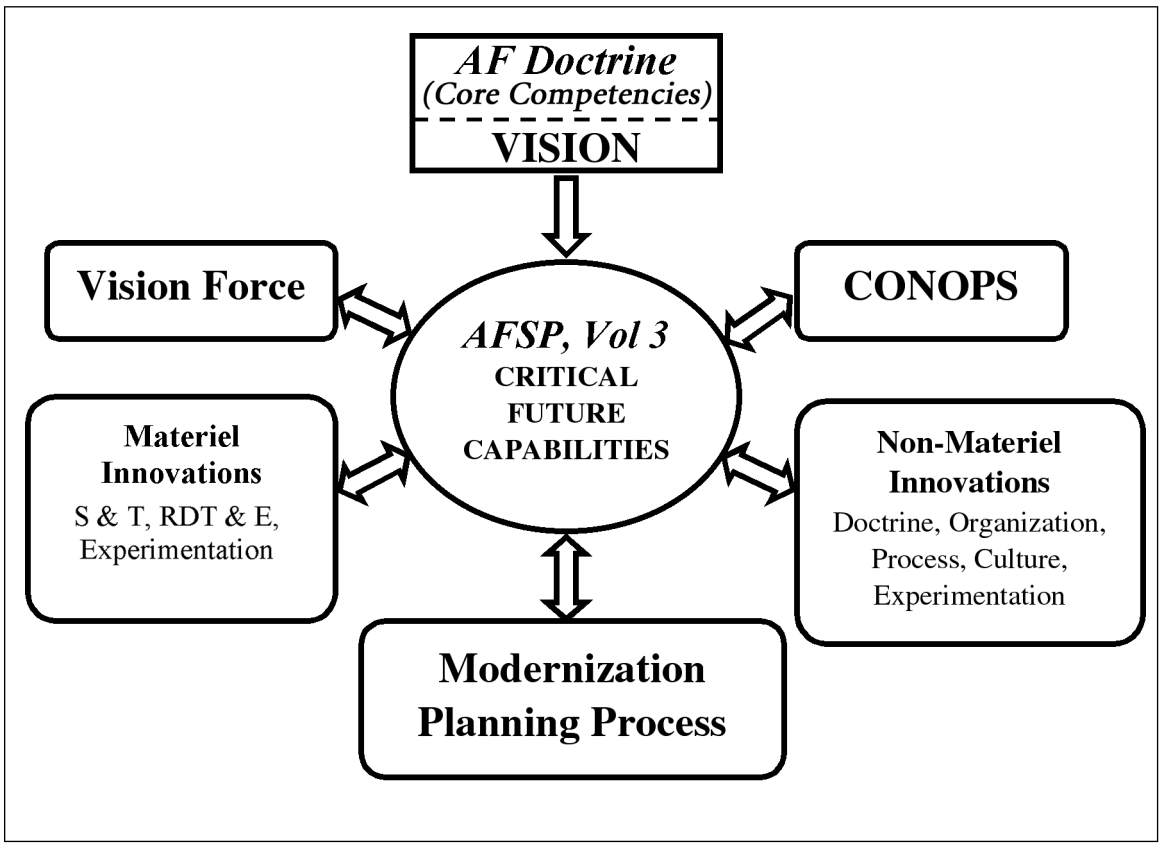
# Critical Future Capabilities

## Introduction

*Critical Future Capabilities* are those capabilities we must maintain, increase, improve, or create to meet the compelling demands of the future security environment. Once realized, these capabilities will fill the gaps in our current capabilities and make the Vision a reality. Each capability discussed plays a role in the decision making process. This process determines what the Air Force plans for and, in turn, how we allocate resources. They are Critical Future Capabilities that, if not aggressively pursued, will result in mission-critical shortfalls in our future force. These shortfalls will occur either in meeting future military demands, given the nature of the mission or forecasted security threats, or in fully realizing potential capabilities, given new concepts and technological opportunities. The capabilities enumerated in the Vision should be the core objectives of Air Force long-range planning, including modernization planning by the MAJCOMs and FOAs.

## Key Relationships

Critical Future Capabilities play an essential role in the overall strategic planning process. First, an interactive relationship exists between Air Force Doctrine and the Vision as illustrated in Figure 2. Air Force Doctrine sanctions our beliefs and warfighting principles and it describes and guides the proper use of aerospace power. Our Core Competencies are the enablers of Air Force Doctrine. The Vision helps us adjust our Core Competencies for the future. To translate the Vision into an imple-



mentation plan, our current challenge is to describe in precise terms the Critical Future Capabilities essential to achieving the visionary adjustments to the Core Competencies.

These Critical Future Capabilities will lay the foundation for a more specific description of how we will use aerospace power to meet National Command Authority taskings described in the Air Force Concept of Operations (CONOPS). Analysis of the Critical Future Capabilities must consider materiel and non-materiel innovations for achieving the desired capabilities to support adjustments to our Doctrine and CONOPS. Finally, to enable our CONOPS, which is linked to our Core Competencies, we must describe a force structure that will allow us to develop the Critical Future Capabilities implied by our Vision. Therefore, these critical capability statements will link the Air Force CONOPS to the Vision Force. This interaction between Critical Future Capabilities, CONOPS, and Vision Force will provide guidance to planning communities throughout the Air Force. Equally important, this volume will allow us to present to our governmental leaders a synchronized and more coherent plan for how we will sustain Air Force transformation to meet the demands of the future.

## Organizing and Using our Capability

Our Vision challenges us to balance our global vigilance, reach, and power responsibilities while maintaining current excellence in theater operations. This challenge has two aspects—how to package a capability for engagement and how we use this capability.

The Air Force has been focused on continuing the transformation from a Cold-War force structure to a true expeditionary force. Our Cold-War force was largely fixed, not only in where it was located, but also in the task that was required of it. The past decade has shown that our Nation needs greater awareness of, and flexibility in, how it can use its aerospace capabilities. Therefore, we implemented the Expeditionary Aerospace Force (EAF). This is a rich concept that allows us to better manage our force, maintain a higher state of readiness, and tailor our assets to more specifically meet the demands of the Joint Force Commander (JFC). It is a **force presentation** concept, not a deployment concept.

Today, we are working to find, fix, assess, track, target, and engage (F2AT2E) any target…but this is not easy. We have demonstrated the true potential of this capability. We took advantage of the synergistic effects of our sensors, communication links, and long-range strike assets to achieve decisive battlespace effects during OPERATION ALLIED FORCE in Kosovo. Although the adversary had a sophisticated, integrated air defense network, it did not have an effective air force nor access to modern surface-to-air missile systems; thus we were able to operate very effectively. However, in the future, we envision several potential adversaries that will make our ability to penetrate much riskier. Equally important, these adversaries may be able to deny us access to their area of influence using several counter-access strategies.

For these reasons, we should understand that true global reach will require new ways to use our sensors, electronic warfare systems, communication links, and weapons. These capabilities will be possible only if we take steps now to realize them. Volume 3 recognizes that we may not always be able to "go to the fight" as soon as we would like. It addresses a need to be able to create sanctuary when we have none. It also gives us options to reduce our vulnerabilities in high-threat environments or in areas where our potential adversaries have used Weapons of Mass Destruction (WMD) or theater ballistic missiles (TBM) to create an exclusionary zone around their area of influence.

Ideal target access exists when Precision Engagement creates maximum lethal or non-lethal effects with minimum collateral damage at reduced vulnerability to our armed forces. Establishing sanctuary is both defensive and offensive. It implies striking down an adversary's counter-access capability as well as maintaining the defensive measures to protect our

forces from conventional and unconventional attack. Sanctuary is being able to operate within an enemy's threat ring. It does not mean that we can attack any target set anywhere within hours. It means that we can bring sufficient force to bear within minutes to begin to negate an adversary's counter-access strategies. Aerospace forces should have sufficient capacity to "knock the door down" early in a conflict so that we can take the preponderance of force forward with acceptable risk.

The evolution of communication capabilities allowing protected and virtually instantaneous global access will allow us to command and control and execute aerospace power in new and different ways. Air Force infrastructure and systems must remain interoperable and exploit the ever-increasing capabilities of global communications. Today, we command aerospace forces from either permanent Command and Control (C2) nodes, such as the Tanker Airlift Control Center (TACC), or from an Aerospace Operations Center (AOC) located in the engagement area. As we envision a robust, protected Global Information Grid, we should be able to assess, plan, and direct aerospace operations in near-real-time from anywhere—and anywhere does not mean only one place. Through distributive operations, elements of the AOC can and probably will be in many places. The commander will be able to begin to fight as soon as directed. He will not need to "go there" first. Therefore, we can, if we want, contemplate "reaching forward." We will have the eyes, the situational awareness, the right engagement capabilities, and the ability to strike from either a deployed or non-deployed posture.

In sum, our Critical Future Capabilities define what the Nation demands from aerospace power in the future. As such, they form the key link between our Vision, our future CONOPS, and our modernization planning. This construct will allow us to focus our investment strategy on those key aspects of aerospace power that permit us to meet our Nation's needs in an uncertain and challenging future security environment.

## Critical Future Capabilities: Described

Each Critical Future Capability comprises five components that complement one another. The ***Capability Statement*** is the caption that describes *what we want to accomplish* in the future. This centerpiece binds the other four CFC components. ***Rationale/Environment*** highlights some of the expected changes to our environment or to our assumptions and *why* the Air Force needs to pursue the capability. ***Implications/Effects*** describe *what* the Air Force will be able to accomplish with the capability. ***Enabling Technologies*** focus on *where* we must drive technological and innovative pursuits to achieve the capability. Finally, ***CONOPS Relationship*** briefly describes *how* the capability ties to the CONOPS. ***Collectively, these five components comprise the Critical Future Capability***—they should be evaluated and used as a complete unit.

The table on the following page lists 14 Critical Future Capability Statements, grouped by Air Force Core Competencies and Core Competency Support Areas.

| CORE COMPETENCIES | Critical Future Capability Statements |
|---|---|
| **Aerospace Superiority** | • Rapidly dominate (within days) adversary air forces and air defenses to allow joint and coalition forces freedom from attack, freedom to maneuver, and freedom to attack.<br>• Consistent with international agreements, render an adversary's cruise, land attack cruise, and ballistic missile assets ineffective before launch or soon after through timely and effective interaction with national and theater missile defense assets.<br>• Protect our space assets and deny, when directed, an adversary's ability to exploit space. |
| **Information Superiority** | • Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battlespace worldwide.<br>• In conjunction with joint and national capabilities, ensure our use of the information domain unhindered by all attempts to deny, disrupt, destroy, or corrupt it; and also ensure our ability to attack and affect an adversary's information and information systems in pursuit of military objectives. |
| **Global Attack** | • Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.<br>• Provide deterrence against WMD attack and coercion by maintaining a credible, land-based nuclear and flexible conventional strike force. |
| **Precision Engagement** | • Create precise effects rapidly, with the ability to retarget quickly, against large target sets anywhere, anytime, for as long as required. |
| **Rapid Global Mobility** | • Provide the airlift, aerial refueling, and enroute infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis (up to an MTW) while maintaining the capability to rapidly swing high-priority forces to another MTW. |
| **Agile Combat Support** | • Build an aerospace force that enables robust, distributed military operations with time-definite sustainment. |
| **CORE COMPETENCY SUPPORT AREAS:** | **Critical Future Capability Statements** |
| **Quality People** | • Build a professional cadre to lead and command expeditionary aerospace and joint forces.<br>• Implement innovative concepts to ensure we recruit and retain the right people—active duty, reserve, guard, and civilian forces—to operate our aerospace force in the future. |
| **Innovation** | • Achieve an unrivaled degree of innovation founded on effective integration and testing of new concepts, non-materiel innovations, advanced technologies, and synergistic experimentation. |
| **Command and Control** | • Assess, plan, and direct aerospace operations anywhere from multiple locations in near-real-time, across the spectrum of operations and levels of command. |

# CORE COMPETENCY: Aerospace Superiority

## Introduction

*The ability to control what moves through air and space ensures freedom of action.*

Aerospace Superiority, aided by Information Superiority and Command and Control, permits freedom of action and movement and prevents interference with the operations of friendly air, space, and surface forces. The joint force relies on the full complement of aerospace power and Aerospace Superiority to protect our homeland and our forces abroad and to communicate to and from overseas theaters.

As we move toward the mid- and long-term time horizon, the international security environment could become more chaotic with non-state actors playing increasingly more influential geo-strategic roles; and the potential exists for conflict with regional competitors wherein U.S. forces are faced with theater denial. In this case, potential adversaries would attempt to leverage their military might through counter-access strategies to force the United States to operate on the periphery of the theater rather than in it. Theater ballistic missiles and Land Attack Cruise Missiles (LACM), with the potential to carry nuclear, biological, or chemical warheads, and other means of delivery for WMD, contribute to these counter-access capabilities. We will need to continue the development of systems to defend against TBMs and LACMs, taking into account joint efforts in these areas. At the same time, we must develop long-range strike capabilities as a hedge against denial of theater access. As we develop new and enhanced aerospace capabilities, planners must ensure compliance with all international treaties and conventions to which we are a signatory.

Aerospace Superiority enables the JFC to establish situational awareness and freedom from attack, freedom to maneuver, and freedom to attack. Aerospace Superiority encompasses air, theater missile defense, and space capabilities. These capabilities combine to create a synergism that supports achieving joint and national objectives. Because specific characteristics are associated with each of these three components of Aerospace Superiority (air, theater missile and LACM defense, and space), we developed critical future capability statements that together encompass the combined aspects of Aerospace Superiority.

Aerospace Superiority is essential to winning in combat. With Aerospace Superiority, the joint force can dominate enemy operations in all dimensions; conflicts are shortened and losses minimized. Without Aerospace Superiority, especially in the years ahead, our forces will be extremely vulnerable and potential losses intolerably high. Effective surface maneuverability and efficient logistics support are more difficult without it. Everything in the battlespace is at risk without Aerospace Superiority, but achieving and sustaining it allows the JFC to prevail quickly, efficiently, and decisively.

# AEROSPACE SUPERIORITY
## Critical Future Capability #1

**Rapidly dominate (within days) adversary air forces and air defenses to allow joint and coalition forces freedom from attack, freedom to maneuver, and freedom to attack.**

### Rationale/Environment

**Environment/Opportunities**

- Forces will be required to dominate the battle space at night, in adverse weather, and on long duration missions, placing our forces at risk due to loss of situational awareness and spatial disorientation.

**Threat**

- Adversaries' counter-access strategies and asymmetrical approaches supported by TBM, cruise missiles, and other WMD will complicate our ability to support joint and coalition forces.
- Technology advances in space-based surveillance and low-observable aircraft, surface-to-air systems, and air-to-air systems are being developed/employed by potential adversaries.
- Potential adversaries have acquired near-real-time information processing and information warfare capabilities.
- Potential adversary air forces' range and lethality have increased and continue to rapidly increase.
- Adversaries continuously improve integrated real-time sensor-to-shooter capabilities to detect and counter aerospace threats.
- Potential proliferation of cruise missile weapon systems and technology could increase the threat from state and non-state actors.
- Increased threat from sophisticated integrated defense systems, including directed energy, exists against aircrews, platforms, sensors, and sub-systems.

### Implications/Effects

- Allows operations deeper into an adversary's territory without providing counter-access forces a lucrative target
- Allows rapid offensive counterair operations with increased lethality
- Improves battlespace understanding, allowing the full, unconstrained application of aerospace power
- Rapidly terminates an adversary's initiative
- Prevents hostile force from using aerospace medium
  - Gains freedom of control in the battlespace, providing freedom from attack and freedom to attack
  - Avoids detection and defeats enemy aerospace detection systems
- Allows ability to strike high-value targets when most vulnerable
- Renders enemy air defenses ineffective at time and place of our choosing
- Continues to improve integrated (with other services and allies) real-time sensor-to-shooter capabilities to find, fix, assess, track, target, and engage (F2AT2E) evolving air (including low-observable aircraft and cruise missiles), ballistic, and surface-to-air threats
- Prevents unnecessary loss of airframes and personnel to loss of situational awareness and spatial disorientation

### Enabling Technologies

- Aerodynamic maneuverability
- Advanced sensors
- Data fusion and target recognition
- Night vision operability
- Power generation and storage
- Radio Frequency (RF), Infrared (IR), and Directed Energy Weapon (DEW) countermeasures
- Hypersonic technology
- Secure communications
- Automatic Ground Collision Avoidance
- Advanced Spatial Disorientation Device Training

### CONOPS Relationship

- In responding to a crisis, it is vital to halt the enemy's ability to act and deny his use of the battlespace.
  - Gains and maintains aerospace dominance for unhindered joint operations

## AEROSPACE SUPERIORITY
## Critical Future Capability #2

**Consistent with international agreements, render an adversary's cruise, land attack cruise, and ballistic missile assets ineffective before launch or soon after through timely and effective interaction with national and theater missile defense assets.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Development and deployment of plasma particle, laser, DEW could offer significant advantages for missile defense.<br>**Threat**<br>• Continued proliferation of missile (TBM, cruise, and LACM) technology and WMD throughout the world will place at risk deployed U.S. and coalition forces.<br>• Maturation of adversary missile guidance, mobile launch, and distance capabilities will bring U.S. territory within the threat coverage. | • Creates the ability to find, fix, assess, track, target, and engage an adversary's evolving cruise missile, LACM, and ballistic missile threats, through integrated, real-time sensor-to-shooter capabilities<br>• Permits early denial of theater missile attack<br>• Protects against:<br>- Homeland attack<br>- Theater attack of 100+ missiles |
| **Enabling Technologies** | **CONOPS Relationship** |
| • Sensors and data fusion<br>• Combat identification and target recognition<br>• Advanced munitions<br>• High-power directed energy | • In shaping the peacetime global environment and in responding to crisis, this capability deters the use of TBM, cruise missiles, LACM, and WMD.<br>- Negates adversary counter-access strategy |

# AEROSPACE SUPERIORITY
## Critical Future Capability #3

**Protect our space assets and deny, when directed, an adversary's ability to exploit space.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• U.S. reliance on space-based sensors creates a vulnerability.<br>• U.S. space superiority could be fleeting if adversaries capitalize on the force-multiplication power space provides or apply asymmetric methods to deny us access.<br>• The criticality of access to space and increased commercialization of orbital space may dictate that U.S. military support be used to protect commercial space assets critical to national security.<br>• Air Force functions continue to be integrated across the aerospace medium.<br>• Aerospace operations will require the supply, resupply, and delivery of resources for the space realm in addition to the air-breathing environment.<br>**Threat**<br>• Potential adversaries will have ready access to militarily significant commercial/third-party space services.<br>• Potential adversaries have developed and continue to advance space control capabilities. | • Denies an adversary's ability to exploit organic and third-party forces<br>• Ensures timely access of space resources to support the JFC and AEF<br>- Efficient and effective use of the full aerospace resource and support environment<br>- Reduced life-cycle costs and increased responsiveness of spacelift assets, payloads, and range infrastructure<br>• Provides support to national, joint, and coalition objectives<br>• Ensures hostile forces cannot prevent our use and development of space<br>• Enables our defensive counterspace operations to:<br>- Survive attacks to control systems with minimal or no damage or impact<br>- Detect and report when under attack<br>- Locate, classify, and identify attacking systems<br>- Minimize the adversary's ability to detect space platforms and weapons |
| **Enabling Technologies** | **CONOPS Relationship** |
| • Antennas and satellite components tailored to the space radiation environment<br>• Power generation and storage<br>• High specific-impulse rocket propulsion<br>• Space protection<br>• Lethal and non-lethal denial mechanisms<br>• Sensors and data fusion<br>• Small/micro satellites<br>• Combat identification and target recognition<br>• Space weather forecast<br>• Space weather effects mitigation<br>• Information assurance | • In shaping the peacetime global environment and in responding to crisis, this capability halts an adversary's ability to achieve aerospace dominance.<br>- Allows us to exploit space during a crisis and denies an adversary the ability to do the same. |

# CORE COMPETENCY: Information Superiority

## Introduction

***The ability to control and exploit information to the Nation's advantage ensures decision dominance.***

Information Superiority is becoming as critical to modern warfare as dominating the air, land, sea, and space environments. Additionally, it is an indispensable and synergistic component of aerospace power. We achieve Information Superiority through our ability to rapidly collect, process, disseminate, and protect information while denying these capabilities to our adversaries. An uninterrupted flow of data and knowledge of the battlespace as well as the ability to use asymmetrical methods to exploit and attack are critical to success in future military operations. Robust, integrated, and protected networks with built-in redundancy and a "self-healing" capability will be powerful force multipliers enabling Information Superiority.

Information Superiority is an essential component of achieving our national security objectives. It contributes to Joint Vision 2020's Full Spectrum Dominance by providing an interactive, common battlespace picture and the ability to exploit and dominate an adversary's information systems and critical infrastructure. The ability to share awareness, create knowledge, and support collaboration through emerging operational concepts will transform the information advantage into an operational advantage. It provides comprehensive knowledge of the status and intentions of both adversary and friendly forces across the air, land, sea, and space components of the battlespace as well as enhanced access to and survivability in that battlespace. It encompasses the entire range of trusted and timely information services and promotes our ability to process information while not allowing the enemy to do likewise.

Today, we can provide target quality data for a small theater in days; tomorrow, we must be capable of doing it with increased fidelity, for a large theater, within minutes. We believe this capability will be critical, not only in meeting the emerging asymmetric strategies of our near-peer and regional competitors, but also in leveraging the promise of evolving global communications capabilities. This requirement implies a growing reliance on space and airborne sensors networked to those near the crisis to provide a high-fidelity picture. Improved space systems will allow us to present a theater picture much faster, because space assets do not require time to move to the area of interest. This gives us critical time to plan. At the same time, there will be a demand for tactical data that can best be provided by manned and unmanned platforms. As these arrive in-theater, their data must be seamlessly added to the common operating picture. If realized, interoperable air and space systems will enable true Global Vigilance and, coupled with other opportunities, better enable Global Reach and Power.

To fulfill this need in the first quarter of the 21st century, the Air Force will need to field Command, Control, Communications, Computers, and Intelligence (C4I) systems that will enable dynamic assessment, planning, and execution of global missions to achieve objectives for the JFC in near-real-time. The systems will be tailorable across the spectrum of operations and integrated horizontally and vertically across components, functions, and levels of command.

Information Superiority implies that we will get the right information to the right person at the right time, thus enabling command-decision execution. It suggests that we will be able to provide different levels of information depending on the needs of the user, type of target, intrinsic psychological value of the target, and the type of operation. It also recognizes the differences between fixed, moving, and mobile targets.

Fixed targets warrant fewer Intelligence, Surveillance, and Reconnaissance (ISR) requirements. Mobile and moving targets' requirements are greater and must include the synergy that can come from the interaction and cross-cueing of systems and sensors. "Any battlespace, any target" implies the requirement to look deep and dynamically reallocate ISR assets. It implies revisit rates of seconds to keep track of moving targets. All this requires an integrated and streamlined information grid in addition to near-real-time ISR Tasking, Processing, Exploitation, and Dissemination (TPED).

The importance of information to the warfighter will only increase as time passes. Opponents with increasing access to sophisticated computers, communications, and intelligence-gathering systems will challenge our Information Superiority substantially and will present strategic, operational, and tactical level threats through their use of information systems. As with space and air, Information Superiority will increasingly require specialized equipment, training, and techniques. Therefore, maintaining the technological lead in ISR, communications, and the development of information assurance and information warfare tools and processes is vital to future warfighting capabilities. It is imperative that joint and coalition forces be able to use information systems freely, knowing the information will be authentic, available, non-repudiated, and secure from access by adversaries. In addition, the use of offensive counter-information tools, in concert with national and joint capabilities, will allow the capability to influence outcomes at the speed of light on a global scale, usually without forward deployment and physical danger. Through Information Superiority, the JFC will achieve real-time command and control over the execution of air and space missions.

## INFORMATION SUPERIORITY
## Critical Future Capability #1

**Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battlespace worldwide.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• U.S. doctrine and tactics strongly rely on precise and timely information for effective battle management.<br>• Continuous tailored information is necessary to apply aerospace power to time-critical targets within the adversary's decision cycle.<br>• Joint and coalition operations will require accurate, interoperable, and timely information to support the entire sensor-to-shooter kill chain.<br>• Increasing use of commercial-off-the-shelf (COTS) technologies will open vulnerabilities in U.S. systems.<br>• The requirement to share information with Civil Reserve Airlift Fleet (CRAF) and coalition partners with varying degrees of technical capability induces vulnerabilities.<br>• Information assurance is essential to protect critical information and information infrastructure.<br>• Spectrum allocation and management are increasingly matters of international debate and national sovereignty.<br>**Threat**<br>• Future adversaries will try to exploit U.S. joint and coalition reliance on information.<br>• Adversaries' advances in technology are contributing to rapid proliferation of sophisticated, hard-to-detect targets (e.g., mobile; chemical, biological warfare [CBW]; cyberspace, terrorist).<br>• Nations and hostile groups can wage cyberattacks with little investment, creating significant asymmetric advantage.<br>• Adversaries' use of modern technology increases dependence on information transmission/consumption. | • Provides global, interoperable, inherently protected, and high-throughput communications capability (e.g., Global Information Grid-AF) for information systems to ensure a full range of trusted and timely information services for joint operations<br>• Protects the global network, and the information in it, from all attempts at information denial, destruction, disruption, exploitation, or corruption<br>• Enables F2AT2E and classification of militarily significant objectives<br>• Supports effective battle management and command and control; ensures decision dominance<br>• Gains, exploits, and disseminates accurate, reliable, and near-real-time battlespace information on all activities, events, and threats (blue/red/gray)<br>• Provides precise knowledge to commanders, allowing them increased influence in the information domain and the battlespace<br>• Provides automated data fusion and cross-cueing of aerospace sensors to conduct real-time, adaptive targeting of mobile and concealed objectives<br>• Allows accurate predictions of enemy intentions, order of battle, centers of gravity, and locations of time-critical targets<br>• Provides high confidence, uncorrupted information that will be available where and when needed<br>• Ensures information architectures, data structures, and software are reliable and provide appropriate access<br>• Streamlines information dissemination<br>• Ensures information received is authentic and classified information is protected at the proper level<br>• Provides autonomous backup systems and automatically restores information that is damaged, degraded, or destroyed<br>• Enables distributed battle management (BM), C2, ISR, and campaign planning<br>• Enables near-real-time in transit visibility (ITV)<br>• Enables flexible Global Attack, Precision Engagement, and Agile Combat Support |

## INFORMATION SUPERIORITY
## Critical Future Capability #1 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Signal processing technology<br>• Advanced sensors<br>• Sensor and data fusion<br>• Combat identification and target recognition<br>• Electro-optical and micro-electronics<br>• Secure information fusion and extraction<br>• Joint battlespace infosphere<br>• High-performance computing<br>• Advanced visualization<br>• Defensive information warfare and information assurance<br>• Advanced records/data management | • In responding to a crisis, this capability is key to enabling other "win" activities.<br>- Focus ISR and establish Information Superiority<br>- Enable strikes throughout the battlespace |

# INFORMATION SUPERIORITY
## Critical Future Capability #2

**In conjunction with joint and national capabilities, ensure our use of the information domain unhindered by all attempts to deny, disrupt, destroy, or corrupt it; and also ensure our ability to attack and affect an adversary's information and information systems in pursuit of military objectives.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Air Force dependence on information systems built on commercial platforms, software systems, and networks to support weapons and command and control systems makes those systems lucrative targets for adversary attack.<br>• Nations and hostile groups can wage effective cyberattacks with little investment, creating a significant asymmetric advantage.<br>• Law and national policy on use of information operations is evolving.<br>**Threat**<br>• Adversaries, especially non-national organizations like terrorists and drug smugglers, easily obtain the latest technological developments.<br>• Major international actors have declared intentions to wage cyberwar.<br>• Adversaries' use of modern technology increases dependence on information transmission and consumption. | • Provides high-confidence, uncorrupted information for use by Air Force weapons and command and control systems that will be available where and when needed<br>• Ensures information architectures, data structures, and software are reliable and provide appropriate access<br>• Ensures information received is authentic and classified information is protected at the proper level<br>• Provides autonomous backup systems to automatically restore information that is damaged, degraded, or destroyed<br>• Promotes partnerships with other DoD agencies, other services, and industry to leverage other information assurance efforts and techniques<br>• Provides the ability to manage and organize protection based upon need-to-know and ability to translate management decisions into a plan that allows information-assurance activities to be routine<br>• Minimizes collateral/friendly physical damage<br>• Is global in scope; deployment not required<br>• Neutralizes advances in adversary technology<br>• Exploits advantages of cyberspace; combats cyberterrorism<br>• Allows integration with standard Air Force operations planning; tasking in Air Tasking Order (ATO)<br>• Allows skills to be exercised at specialized, possibly virtual, training ranges<br>• Complicates adversaries' decisions by allowing corruption of adversary information<br>• Neutralizes adversaries' will to wage war through full-spectrum information operations (including electronic warfare, physical attack, information attack, psychological operations [PSYOP], and deception)<br>- Leverages joint strike operations and info operations with support of public affairs capability<br>• Ensures emerging information weapons systems and tactics comply with the Law of Armed Conflict, international legal obligations, and national policy |

## INFORMATION SUPERIORITY
## Critical Future Capability #2 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Defensive information warfare and information assurance<br>• Space protection<br>• Ultra wideband, secure communications<br>• High-density data storage and retrieval<br>• Intelligent networks<br>• Intelligence Collaborative Environment (ICE) | • In shaping the peacetime global environment, this capability protects our info systems. In responding to crisis, it halts adversaries' ability to use their information systems. |

# CORE COMPETENCY: Global Attack

## Introduction

***The ability to engage adversary targets anywhere, anytime holds any adversary at risk.***

Global Attack gives the joint force the ability to find and attack targets of choice anywhere using the synergy created by aerospace assets throughout the full spectrum of conflict.

Global Attack relies on the military utility of aerospace power—speed, range, and flexibility. Global Attack also relies heavily on Information Superiority and command and control capabilities to perform F2AT2E and battle management functions. It makes an adversary's most critical targets vulnerable—regardless of location. The ability to engage globally and apply force, using both lethal and non-lethal means, is vital to support the demands of the shaping, responding, and preparing tenets of today's *National Security Strategy*. It offers an opportunity, when coupled with the advantages of surprise and survivability, to enhance conventional deterrence.

To counter the Global Attack capability, potential adversaries have and are developing sophisticated integrated air defense systems and are pursuing counter-access strategies and capabilities. The evolving expeditionary nature of aerospace power and Global Attack capabilities contribute directly to providing the JFC options to counter threats to forward-deployed forces. Global Attack supports the JFC's ability to respond to asymmetric strategies of adversaries who seek to deny access to U.S. power projection forces.

# GLOBAL ATTACK
## Critical Future Capability #1

**Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Threat**<br>• Proliferation of WMD may require longer range strike capability to protect U.S. forces.<br>• Potential adversaries have, and are continuing to aggressively pursue, counter-access strategies and capabilities (TBM and cruise missiles).<br>• Increased threats from sophisticated integrated air defense systems, including directed energy (DE), exist against aircrews, platforms, sensors, and sub-systems. | • Holds at risk high-value adversary objectives and reduces the will to resist<br>• Permits force application (lethal or non-lethal) against any/all adversary centers of gravity within the adversary's decision cycle<br>• Capitalizes on advanced stand-off capabilities to achieve desired weapons effects while remaining beyond the adversary's ability to respond and minimizing effects from counter-access strategies<br>- Minimizes logistics footprint and optimizes force protection of deployed forces<br>• Disrupts an adversary's timing and ability to prosecute warplans through swift force application to rapidly halt aggression |
| **Enabling Technologies** | **CONOPS Relationship** |
| • High-power directed energy<br>• Advanced sensors<br>• Sensor and data fusion<br>• Combat identification and target recognition<br>• Hypersonic technology<br>• High-speed dispenser technology<br>• Nuclear, biological, and chemical (NBC) detection and protective technologies<br>• Night lighting compatibility with laser DE protection and improved night vision devices and goggles<br>• Dynamic effects-based operations | • In responding to a crisis, this capability halts the enemy's undesired activity.<br>• Sufficient timeliness to mass effects to neutralize targets while reducing vulnerability to our forces presents a credible deterrent to enemy aggression and, if needed, the ability to deny him sanctuary. |

## GLOBAL ATTACK
## Critical Future Capability #2

**Provide deterrence against WMD attack and coercion by maintaining a credible, land-based nuclear and flexible conventional strike force.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Sustaining a credible nuclear and flexible conventional deterrent posture signals near-peer competitors of U.S. resolve to apply the full extent of U.S. might to contain aggression.<br>**Threat**<br>• Continued proliferation of ballistic and cruise missile technology and WMD throughout the world creates a growing threat not only to U.S. and coalition forces overseas but to U.S. territory. | • Sustains the effectiveness of U.S. strategic deterrence<br>• Maintains the synergistic effect of the responsiveness, flexibility, and survivability offered by the current Triad<br>• Maintains weapons and platforms with ability to project power over global distances<br>• Maintains ability to dominate escalation in crisis or conflict against any adversary |
| **Enabling Technologies** | **CONOPS Relationship** |
| • NBC detection technology<br>• WMD neutralization payload<br>• Force protection<br>• Blast protection materials<br>• National and theater missile defense technologies<br>• Ballistic missile technologies<br>• Deeply buried target defeat | • In shaping the peacetime global environment, this capability provides broad deterrence to the use of WMD.<br>- Supports the "shape" component of our National Security Strategy<br>- Provides "ultimate insurance" for supreme national interests |

# CORE COMPETENCY: Precision Engagement

## Introduction

***The ability to deliver desired effects with minimal risk and collateral damage denies the enemy sanctuary.***

Precision Engagement is the capability that enables U.S. forces to locate the objective or target, provide responsive command and control, achieve the desired effect, assess the level of success, and retain the flexibility to re-engage with accuracy when required. Our goal is to find, fix, assess, track, target, and engage anything of military significance. The essence of Precision Engagement lies in its ability to apply selective force against specific targets and achieve discrete and discriminate effects. It encompasses electronic warfare to gain survivable access, lethal and non-lethal attack, precision airdrop (stand-off and point-of-use), special operations, combat search and rescue, and foreign internal defense (FID) in all weather, day and night. Precision Engagement is critically dependent upon continuous, timely, and accurate information about the target.

Precision Engagement provides the Commander in Chief (CINC) with the ability to achieve the desired effect, whether in war or in peacekeeping activities, with specially trained people or highly accurate weapons at anytime, under any condition, and survive the hostile environment. Under Precision Engagement, these actions are undertaken with acceptable risk and minimal collateral damage.

# PRECISION ENGAGEMENT
## Critical Future Capability #1

**Create precise effects rapidly, with the ability to retarget quickly, against large target sets anywhere, anytime, for as long as required.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Future environments will require precise application of military capabilities in terms of timing, targeting, and lethality and will demand:<br>- Quick reaction to time-urgent calls for precision strikes with little time available to fly from launch points to target (important for "pop-up," moving, or relocatable targets).<br>• Future missions will likely require minimal collateral damage and tightly controlled use of force.<br>• Economic, political, and military operations will require increased interaction by joint forces.<br>• Positive, timely combat ID will be essential.<br>• Sensors are becoming counter-stealth capable and resistant to electronic attacks.<br>• AEF capabilities will be enhanced by the ability to address multiple target types (i.e., area targets, soft targets, hardened point targets).<br>**Threat**<br>• Recovery of isolated personnel or equipment during wartime or contingency operations remains a high priority.<br>- Adversaries may use a strategy to capture personnel or equipment to use for information and propaganda.<br>• Adversaries' use of easily obtainable, modern technology increases dependence on information transmission and consumption.<br>• Sophisticated, integrated air defense systems pose significant threats to joint and coalition forces.<br>• Proliferation of WMD, TBMs, and cruise missiles requires longer-range strike capability to protect forces. | • Employs pinpoint effects against the full range of objectives<br>• Provides tailored force packages with increased lethality and decreased vulnerability to rapidly terminate an adversary's initiative<br>• Defeats threat protection systems<br>• Allows greater freedom of action<br>• Provides the ability to mass weapons effects on enemy forces and maintain the tempo of operations<br>• Builds an aerospace force that assesses, trains, and advises foreign nationals to foster improved relations and sets stage for future coalition operations<br>• Reduces collateral damage and risk of fratricide<br>• Supports stand-off warfare operations<br>• Provides capability to engage moving targets<br>• Provides potent and timely engagement of valuable targets when they are most vulnerable<br>• Provides systems to locate and recover personnel and sensitive equipment from hostile environments<br>- Preserves critical combat resources and denies enemy sources of intelligence and propaganda<br>• Provides ability to engage rapidly emerging time-critical threats<br>• Provides precise target and environmental data on a timely basis<br>• Creates direct links from sensor to shooter |

## PRECISION ENGAGEMENT
## Critical Future Capability #1 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Dynamic effects-based operations<br>• High-power DE<br>• Advanced munitions<br>• RF, IR, and DEW countermeasures and counter-countermeasures<br>• High-speed dispenser<br>• Combat Search and Rescue (CSAR) visualization/situational awareness tool<br>• Night vision operability<br>• Advanced sensors<br>• Sensor and data fusion<br>• Combat identification and target recognition<br>• Precision/stand-off airdrop<br>• "Over-the-horizon" (OTH)/"beyond line-of-sight" (BLOS) ultra wideband, secure communications | • In responding to a crisis, it is necessary to isolate and incapacitate enemy centers of gravity, e.g., F2AT2E.<br>- Nodal Targeting<br>- Achieves the objective without unnecessary collateral damage |

# CORE COMPETENCY: Rapid Global Mobility

## Introduction

***The ability to rapidly position forces anywhere in the world ensures unprecedented responsiveness.***

The success of the Expeditionary Aerospace Force concept rests on the ability of Rapid Global Mobility to precisely position forces and equipment on the globe quickly and decisively in response to unexpected challenges to protect national interests. We will be able to deploy an AEF in 48 hours—fast enough to curb many crises before they escalate. We will be able to rapidly deploy additional AEFs—up to 5 AEFs in 15 days—providing joint force commanders with options to begin offensive operations and halt and win major theater wars.

The optimized combination of active duty and air reserve component (ARC) military airlift and air refueling forces, supported by robust enroute infrastructures and supplemented by the CRAF during major operations, is the basis of Rapid Global Mobility—the most reliable force multiplier for the National Command Authority, Joint Team, and coalition partners.

Airlift and mobility support forces offer the commander a degree of speed, range, and flexibility not available with any other mode of transportation. In the case of humanitarian operations, where the rapid delivery of food and medicine is paramount, our mobility forces are routinely first on the scene. The demands placed on the Nation's airlift forces are continuous, highly unpredictable, and global in scope.

Aerial refueling greatly enhances Rapid Global Mobility and extends its effective limits. Aerial refueling forces can support both inter-theater and intra-theater operations. Inter-theater aerial refueling supports the long-range movement of airlift, combat, and combat support air forces. Typically, this movement will be between the CONUS and a theater or between theaters. This flexible "air bridge" concept functions as a force multiplier by accelerating the deployment cycle and reducing dependency on forward staging bases and host-nation support. In theater operations, aerial refueling acts as a force enhancer by extending the range, payload, and loiter time of combat and combat support forces.

Air mobility support provides responsive, worldwide support to airlift and aerial refueling operations. This support comes from an existing but limited set of permanent CONUS and enroute locations. Deployable forces capable of augmenting the fixed enroute locations or establishing enroute locations where none exist are also an integral part of this system. Forces at these locations provide continuous global command and control over the Mobility Air Forces (MAF) and maintenance and aerial port services.

The mobility enroute infrastructure should encompass peacetime locations outside the CONUS to support the Defense Transportation System. The support structure at these locations provides local command and control, aircraft maintenance, and aerial port support. These locations should be staffed to support peacetime requirements and augmented to support critical throughput requirements during contingency operations. The locations should provide a stepping stone for air mobility to reach worldwide destinations.

# RAPID GLOBAL MOBILITY
## Critical Future Capability #1

**Provide the airlift, aerial refueling, and enroute infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis (up to an MTW) while maintaining the capability to rapidly swing high-priority forces to another MTW.**

### Rationale/Environment

**Environment/Opportunities**

- Access to overseas infrastructure—including both deployed and enroute support locations—is becoming more uncertain, compelling airlift forces to be able to bypass enroute locations to support U.S. and joint elements worldwide.
- Access to worldwide airspace is becoming equipment-dependent, and aircraft and crews must be prepared for this continuing evolution.
- Deployments are becoming more heavily dependent on refueling capability.
- Withdrawal of U.S. forces from many overseas bases requires Mobility Forces capable of quickly responding to crisis worldwide.
- Reducing the dependence on enroute structures during planning will enhance AEF capabilities:
  - AEF CONOPS will require robust, sustained aerial refueling capability for deployment and employment.
  - AEF CONOPS will require indigenous force protection, C4ISR, and logistic support.

**Threat**

- Mobility Forces are becoming vulnerable to information attacks due to increasing dependence on information exchange via unclassified systems.
- Increasing ability and intent of our adversaries to gather information on Air Force operations using various methods require OPSEC emphasis in mobility CONOPS.
- All Mobility Forces (penetrating and non-penetrating or tactical and non-tactical) will be at risk due to a robust array of threats, including man-portable and fixed-site IR, RF, and DE air defense systems.

### Implications/Effects

- Provides the ability to deliver aerospace and joint expeditionary forces with great speed, which can be critical in suppressing or preventing conflict or mitigating suffering
- Provides infrastructure to support and sustain future expeditionary deployment operations with minimal response time and at acceptable risk
- Ensures aerial refueling fleet can meet joint and national requirements
- Provides operations in conventional and WMD/NBC environments to support forward deployed joint elements with acceptable risk
- Enables balanced operations between forward-based and CONUS-based support
- Allows aircraft to operate in man-portable air defense system environments with acceptable risk
- Quickly halts opposing forces short of their objectives, reducing the level of effort required to eject a dug-in enemy
- Provides aircraft and crews with equipment required to operate in a worldwide environment
- Provides the ability to rapidly deploy short-notice, initial force protection, air mobility C2, and quick beddown of operational and support forces

### Enabling Technologies

- Materiel-handling equipment and techniques
- Deployment planning tools
- Night lighting compatibility
- Night vision operability
- Autonomous zero-ceiling/zero-visibility capability
- Lightweight and stronger structures/platforms
- RF, Electro-optical (EO), and IR countermeasures
- Tactical transport
- Secure communications

### CONOPS Relationship

- In shaping and responding to a crisis, this capability ensures we can marshal forces to rapidly halt an adversary's action to contain a crisis.
- The ability to move forces rapidly is fundamental to operations across the spectrum of conflict (peacetime shaping, humanitarian relief operations [HUMRO], global conflict).
  - Enables rapid response to contain crisis and seize initiative

# CORE COMPETENCY: Agile Combat Support

## Introduction

***The ability to sustain flexible and efficient combat operations is the foundation of success.***

Fast, flexible, responsive, and reliable support to the warrior is the foundation of all Air Force operations. Agile Combat Support is designed to provide users the confidence to reduce investment in and the size of inventories. The success of the Expeditionary Aerospace Force concept ultimately rests on the ability of the Air Force to bring its forces rapidly to the fight. Agile Combat Support facilitates this by creating an environment in which units can confidently deploy forward with fewer functions, personnel, and resource stocks in an effort to achieve up to a 50 percent smaller footprint. This frees up critical strategic mobility capacity that, in turn, allows the Air Force to deliver more forces and resources to the fight sooner. Agile Combat Support compensates for the reduction in forward-deployed assets by employing reachback and time-definite delivery techniques—reaching back to CONUS and other intermediate support locations for the delivery of required items where and when they are needed.

Reachback provides ready access to rear U.S.-based organizations for support, reducing the deployment footprint and allowing resources to be used more efficiently. Its aim is to capitalize on all potential sources of essential assets and services. Reachback also leverages the industrial base and organic operations to streamline military operations and respond to our potential adversaries' counter-access strategies.

Effective combat support operations allow United States component commanders of joint/allied/coalition forces to improve responsiveness, deployability, and sustainability of their forces. Forces must be able to effectively and efficiently deploy, set up, sustain, and break down aerospace equipment and facilities. Additionally, Agile Combat Support relies on aerial refueling and aerial delivery support, further enabling combat effectiveness. Information technologies featuring both leading-edge capabilities and technical updates of existing systems are key to allowing the Air Force to reduce its in-theater footprint. The efficiency and flexibility of Agile Combat Support substitute responsiveness for massive deployed inventories.

# AGILE COMBAT SUPPORT
## Critical Future Capability #1

**Build an aerospace force that enables robust, distributed military operations with time-definite sustainment.**

### Rationale/Environment

**Environment/Opportunities**

- Uncertain world conditions drive need for beddown and sustainment assessment and planning for potential operating locations.
- Forces must be able to deploy and sustain operations in an austere environment.
- Increased OPTEMPO will require a lean, efficient combat support system.
- The system must provide visibility automatically with minimum input from technicians.
- Time-urgent, fluid battlespace will require retasking of personnel and sustainment assets.
- Information systems must be able to continuously track and account for all personnel, parts, and equipment.
- Variance-driven decision tools should maximize use of available parts and anticipate needs where possible.
- Aging aircraft will make it more difficult to support future requirements.
- Force protection is essential to safeguard personnel, sortie generation, and mission-critical resources.

**Threat**

- Counter-access strategies, forward-based vulnerability, and competition for scarce strategic lift necessitate a smaller deployment footprint.
- Potential adversaries are pursuing the ability to deploy and engage with NBC weapons.

### Implications/Effects

- Provides a sustainable, maintainable force that can conduct operations in a variety of scenarios
  - Allows forces to be employed in-theater quickly by reducing the personnel and equipment necessary to support operations
  - Permits the deployment of more weapon systems sooner due to a 50 percent reduction in deployment footprint
  - Reduces system failure rate to allow more sorties with fewer aircraft (more bombs on target)
- Provides flexible logistics support, materiel, and supplies
- Provides mechanism to negotiate for processing, maintaining, and storing pre-positioned assets worldwide
- Provides a right-sized infrastructure to provide responsive and efficient support across spectrum of conflict
- Provides enhanced force protection countermeasures that enable forces to operate aerospace equipment and facilities
- Provides a seamless, near-real-time awareness and enroute tracking of all Air Force assets wherever they are to maximize their effective use
  - Provides capability to retarget resources between origin and destination point
  - Provides potential for single ordering system to manage materiel for JFC
  - Reduces risk inherent with long logistics tail
- Ensures aircraft are mission ready
- Provides ability to operate unhindered in an NBC environment

### Enabling Technologies

- Secure/collaborative/distributed logistics management tools
- Process Reengineering support technology
- High-power computing
- Mobile, light, modular equipment
- On-board gas generation
- Rapid aircraft battle damage assessment (BDA) and repair
- Enhanced aging aircraft reliability, maintainability, and sustainability technology
- Force protection
- Night vision operability

### CONOPS Relationship

- In response to crisis, this capability provides joint forces with the ability to win (leverage control) and to achieve operational objectives.
- Sustained operations are necessary to prevail in most crisis situations.
  - Provides force protection critical to surviving enemy attempts to enforce a counter-access strategy

# CORE COMPETENCY SUPPORT: Quality People

## Introduction

> ***We must prepare a future total force cadre with physical and moral courage, aerospace doctrine expertise, and the capacity to lead and command aerospace and joint forces.***

The cornerstone of our Air Force is quality people. Our people are well trained, fit, motivated, and ready to serve their country. They are our most valuable resource and our top priority.

Tomorrow's force, like today's, will be grounded in the ideals embodied in the Air Force core values: *integrity first, service before self, and excellence in all we do*. Although the first quarter of the 21st century will present new challenges to Air Force people, the foundation of core values will be constant. To build a force that shares common goals, purpose, and identity, the Air Force must focus on the following functional areas: leadership, doctrine, recruitment, education and training, quality of life, health, fitness, equal opportunity, professional development, mentoring, and organization. Of great importance is the integration of its active duty, reserve, guard, civilian, and contractor personnel into the Future Total Force (FTF). Training will continue to be paramount to ensure our people understand the rapidly advancing technologies that will be used to operate our aerospace force in the future.

As the most technically sophisticated and powerful aerospace force in the world, we cannot sustain the level of leadership or the degree of strategic vision necessary to command our force effectively without appropriate training and professional education. Training will provide the expertise necessary to operate the advanced technologies we have and will continue to acquire in the 21st century. These technologies provide a vast array of capabilities, which are available to aerospace warfighters and leaders in support of national defense. Only education can produce warfighters who can use these capabilities innovatively and develop leaders who can effectively synthesize those capabilities to produce effective operational and strategic outcomes. We will create an infrastructure that will provide both time and resources to train our people and allow them to practice their skills. Generating and sustaining the innovation that enables this synthesis of capabilities requires the training in reflective, high-level thinking that lies at the heart of Air Force professional education. Its importance to the 21st century Air Force cannot be overstated.

Our force will be expeditionary, configured for the full spectrum of aerospace activities. Our rotational structure will provide predictability for our people and stability for their training. Predictability is also key to optimizing peacetime participation of our traditional Guardsmen and Reservists who must balance military duties with full-time civilian employment. Mitigating personnel tempo (PERSTEMPO) is also a priority. Our people are the best America has to offer; but when tired and stressed, they cannot perform to their maximum potential. Providing our people with the right tools and the time and training to use them will help ensure that every Airman has the opportunity to excel.

## QUALITY PEOPLE
## Critical Future Capability #1

**Build a professional cadre to lead and command expeditionary aerospace and joint forces.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Manpower will continue to be a scarce resource and retention of personnel a significant challenge.<br>• There will be an ever increasing need to draw on the total Air Force team, active, ARC, civilians, contractors, and retirees.<br>• Today's civilian workforce will be retiring in the early years of this century, and creative ways must be found to shape and control this loss of expertise and replace it with new personnel as either employees or contractors.<br>• Government pay scales may continue to be non-competitive, particularly in critical technical skills.<br>• The availability of new accessions, whether civilian or military, with mechanical skills is decreasing.<br>• Members will need the knowledge and expertise to understand aerospace capabilities and doctrine.<br>• Senior leadership must be trained and cross-assigned to learn air, space, and information capabilities and operations.<br>• Military leaders will need to understand the full spectrum of Expeditionary Aerospace Forces and military operations.<br>• There will be a necessity to leverage technology to work smarter, faster, and more effectively. | • Provides the educational background to ensure that our JFACC are proficient in air, space, and information operations<br>• Provides an integrated aerospace leadership development and professional development path that ensures senior leaders are prepared to employ aerospace forces effectively<br>• Provides knowledgeable and experienced civilian leaders to support aerospace operations<br>• Provides enhanced professional education opportunities for civilian employees<br>• Provides an integrated aerospace career path for line officers and enlisted personnel to provide breadth and depth of experience in the employment and doctrine of aerospace capabilities<br>• Optimizes the unique strengths from each of these work forces<br>• Provides time and opportunity to accomplish OJT<br>• Enables the use of state-of-the-art technology applications for professional military education (PME), civilian professional education, and career field upgrade training for both in-residence and distributive learning (DL) programs |
| **Enabling Technologies** | **CONOPS Relationship** |
| • Cognitive performance modeling<br>• Human interaction in complex automated systems<br>• Enhanced, distributed, and virtual learning technologies | • In our effort to smoothly transition into an expeditionary aerospace force, we must provide superbly trained, educated, and experienced leaders who can devise and execute aerospace-dominant strategies.<br>- This includes a Future Total Force leadership cadre immersed in aerospace and joint professional development and operational experiences. |

## QUALITY PEOPLE
## Critical Future Capability #2

**Implement innovative concepts to ensure we recruit and retain the right people—active duty, reserve, guard, and civilian forces—to operate our aerospace force in the future.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• As socio-economic demands and personal expectations change, the future requires a change in personnel activities.<br>• Innovation in advertising and incentives needs to be incorporated in Future Total Force—active duty, civilian, and reserve forces—recruiting and retention efforts.<br>- Changing situations require increased emphasis on FTF recruiting and retention efforts.<br>- Concentrated efforts must be made to recruit and retain both civilian and military personnel.<br>• World-class technical training provided at the appropriate level and time is crucial to the development of FTF personnel.<br>• FTF recruiting/training/retention challenges are crucial to readiness:<br>- FTF commanders will require fully trained, highly skilled personnel to support mission needs.<br>- High tempo rates, low compensation, and health care concerns are top priorities in retention efforts.<br>- Increasing numbers of high school graduates are attending college.<br>- The civilian workforce is aging, with a large percentage reaching retirement age within the next 10 years.<br>- Accessing civilian employees with current skills and training is essential.<br>- Quality of life issues and organizational loyalty remain essential.<br>• Technological advances, demographics, and economic competition from industry impact the ability to access and retain quality people.<br>- Despite robust recruiting efforts to publicize and recruit our new expeditionary force, a strong economy and low unemployment offer numerous alternatives.<br>- The competition with private industry for critical skills, especially those in engineering and technology, will be fierce.<br>- Nuclear, operational, scientific, and technological expertise will be required.<br>• The health care services provided to Air Force personnel and their family members must exhibit assured quality as well as world-spanning continuity of effort and seamless documentation. | • Ensures a viable and high-quality force of people to support expeditionary aerospace operations<br>• Enables development of alternative accession, retention, and career paths<br>• Provides FTF mix of capabilities, expertise, and knowledge to operate and control expeditionary forces<br>• Provides the capability to access individuals who possess the background and ability to perform the future missions of a global aerospace force<br>• Ensures maintaining a highly skilled force and provides incentives to keep trained personnel free to focus on contributing to Air Force readiness<br>• Ensures flexible work/life strategies that promote family readiness which directly support expeditionary aerospace operations<br>• Provides high-quality, off-duty, voluntary education programs both on base and in distributive learning formats<br>• Forward deployed medical support lowers casualty rates and speeds the return of forces to wartime operations |

## QUALITY PEOPLE
## Critical Future Capability #2 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Enhanced distributed/virtual learning technologies<br>• Individualized, self-paced training to enhance performance<br>• Reductions in physical, perceptual, and cognitive workload<br>• Reduce personnel life-cycle costs<br>• Personal equipment weight reductions<br>• World-wide web use and integration into aerospace personnel operations | • In preparing now for an uncertain future, this capability ensures that the Air Force recruits and retains properly trained, educated, compensated, qualified, and experienced FTF personnel who form the underpinnings of a successful coalition and joint force strategy. |

# CORE COMPETENCY SUPPORT: Innovation

## Introduction

***Innovation is more than inserting technology into the force; it is a commitment to the continual renewal of how we operate in the aerospace continuum and how we organize to provide the Nation the most effective capabilities for its investment.***

Innovation and adaptation are key to ensuring today's Air Force is positioned to meet tomorrow's challenges. The Air Force has a long tradition of visionary technology exploration and support. OPERATIONs DESERT STORM and ALLIED FORCE confirm that technological superiority and its correct employment will be critical to countering future threats. We must now position ourselves to make sure that superior technology will be available for conflicts in the future. It is critical that we provide the initiative, direction, and support to identify and develop the materiel and non-materiel innovations needed through 2020 and beyond. This effort will require extensive experimentation to understand the impacts of emerging technologies.

Innovation is much more than technology; it is adapting to new organizational ideas and new concepts, including Air Force tactics, training, and procedures. Innovation also needs to consider joint and combined force interoperability. In addition, modeling, simulation, and experimentation are critical enablers of innovation by providing laboratories to explore, test, and validate new and creative concepts. Thorough testing and evaluation of today's innovative ideas are crucial to successful operations tomorrow.

We know that achieving success in technology development can take up to 20 years. The innovations we pursue now will become the weapon systems that our airmen will use to face an uncertain future and that we position to meet future national security needs. Even during times of difficult funding, the need exists to invest in research and development that is not tied to emerging weapon system programs but that focuses on long-term science and technology investment. Command interests, exploratory technologies, and advanced technology demonstration initiatives must be balanced. We must also strive to broaden our scope and consider other service, Defense Advanced Research Projects Agency, National Aeronautics and Space Administration, and foreign initiatives.

Perhaps most importantly, our service must encourage innovative thinkers by remaining open to new ideas, whatever the source. We must provide a strong career path for acquisition, scientific and technical officers, and civilians that expands their operational understanding of aerospace operations. Similarly, we need to expand acquisition and science and technology opportunities for other line officers. This approach lays the foundation for future leaders with a comprehensive aerospace mindset.

# INNOVATION
## Critical Future Capability #1

**Achieve an unrivaled degree of innovation founded on effective integration and testing of new concepts, non-materiel innovations, advanced technologies, and synergistic experimentation.**

| Rationale/Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Evolving methods of warfare and constrained defense budgets demand that only the most combat-capable and cost-effective systems are developed and procured.<br>• Successful innovation demands highly disciplined vertical and horizontal integration:<br>- Vertical elements include RMA, JV 2020, Air Force Vision 2020, JWS&T Plan, AFSP Vol 3, MAPs and MSPs, and Air Force S&T program.<br>- Horizontal elements include Joint Warfighting Exercises, ACTDs, Technology Needs, Battlelabs, ATDs, Wargames, Joint Test and Evaluation Initiatives, Air Force participation in Joint Experimentation, Large-scale Air Force Experiments (JEFX), and Concept Calls.<br>• Increased OPTEMPO means the best decisions must be made in less time.<br>• Weapons must be highly accurate, minimize collateral damage, minimize delivery and acquisition costs and must enhance, and be enhanced by, aerospace capabilities.<br>• Accelerating technological advances require rapid innovation and threaten to outpace the training and experience of S&T personnel.<br>• Innovation requires an optimum balance (or "push-pull") between operational concepts and technology:<br>- Innovative concepts drive the quest for new and emerging technologies.<br>- New and emerging technologies fuel the application of innovative concepts.<br>**Threat**<br>• Potential adversaries have and are continuing to develop countermeasures against our most advanced systems. They also will attempt to employ asymmetric strategies (i.e., TBMs, NBC, Cyberwarfare, other terrorist actions) to counter our technological and operational advantages. | • Provides the ability to perform trade-off analyses between manned and unmanned aerospace systems and concepts<br>• Ensures all aspects of aerospace operations are accurately represented in wargames and exercises<br>• Validates areas of focus for future R&D funding through modeling and simulation<br>• Expands strategic commercial partnerships through developed exchange programs<br>• Provides the full range of capabilities to respond to challenges in the next 20 years<br>• Provides S&T support vital to exploit technological advances required to revolutionize future aerospace operations<br>• Encourages Air Force people to innovate and exploit new ways to foster innovation<br>• Acquires and maintains a leading-edge infrastructure (laboratories, test/experimentation facilities, and modeling and simulation capabilities) that cultivates unparalleled innovation<br>• Provides S&T support vital to exploit technological advances required to revolutionize and train future aerospace operations |

## INNOVATION
## Critical Future Capability #1 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Advanced biometrics<br>• Offensive and defensive DEW capabilities<br>• Micro-miniaturization and nanotechnology<br>• Hypersonic technology<br>• High performance computing<br>• Reduced structural weight technologies<br>• Artificial intelligence<br>• High power directed energy<br>• Autonomous, intelligent controls<br>• Mobile robotic systems<br>• Modeling and simulation technology<br>• Ultra high temperature materials<br>• Human-machine interactions<br>• Refined highly energetic materiels, including isomers<br>• Joint battlespace infosphere technologies<br>• Unmanned aerial vehicles<br>• Distance Learning technologies<br>• Advanced Human Systems and Cognitive Skills integration<br>• Open technology systems | • CONOPS will change with time; innovation ensures programs and warfighting concepts adapt to the new CONOPS |

# CORE COMPETENCY SUPPORT: Command and Control

## Introduction

***The pace of warfare is accelerating, and future aerospace commanders must make lightning-fast, accurate decisions to reduce the time for execution from days to hours to minutes.***

"To fulfill this need in the first quarter of the 21st century, the USAF will field a C2 system that will enable dynamic assessment, planning, and execution of the global missions to achieve objectives for the joint force commander in near-real-time. The system will be tailorable across the spectrum of operations and be horizontally and vertically integrated across components, functions, and levels of command." (Aerospace C2ISR Campaign Plan 2000)

Global Vigilance capabilities will provide the ability to be predictive, therefore controlling and less reactive. Global Vigilance permits commanders at all levels to do the *right* things at the *right* time in the *right* way—and do it all *faster* than the other guy. Developing a highly effective Global Vigilance capability that is tightly integrated into command centers is the underpinning of every key joint C2 process and enables both command effectiveness and efficiency. The Air Force operates the majority of sensors in the battlespace and has a special responsibility to provide a fused battlespace picture to the joint community. However, Global Vigilance provides not only red order of battle but also blue order of battle. The commanders' knowledge of the location and strength of forces in-theater, in the rear, and in the pipeline is as important as knowledge of enemy activity and plans.

Command and control depends on the exploitation of information. Commanders rely on information to depict the battlespace, detect attack, determine adversary intent, define capabilities, direct the maneuvers and positioning of commanded forces, and determine their effect. This critical reliance on information underwrites the joint tenet of Full Spectrum Dominance. Interactive information sharing through distributed and collaborative operations effectively makes each command center, e.g., the Aerospace Operations Center and Tanker Airlift Control Center, an extension of all other networked Dynamic Aerospace Command (DAC) centers. There will be ready access to specialized assistance through interaction with other centers. This results in the option to deploy forward a much smaller C2 node than today's standard. In the future, global partnership and distributed and collaborative interactions will replace and improve on today's reachback concept.

Global Grid is the fundamental enabler of global awareness and the Dynamic Aerospace Command concept. These concepts are dependent on universal global connectivity via robust self-healing networks with no single point of failure. This connectivity holds joint operations together. It will also allow us to modify our C2 concepts and processes and reduce theater C2 infrastructure.

## COMMAND AND CONTROL
## Critical Future Capability #1

**Assess, plan, and direct aerospace operations anywhere from multiple locations in near-real-time, across the spectrum of operations and levels of command.**

| Rationale/ Environment | Implications/Effects |
|---|---|
| **Environment/Opportunities**<br>• Future environments require all engaged commanders to have a common situational understanding that fosters rapid decision making.<br>• Enhanced command and control, and improved intelligence, along with other applications of new technology will transform the traditional organizations and functions of maneuver, strike, protection, and logistics.<br>- Dynamic, interactive, enroute situational awareness is key.<br>• Dramatic improvements in communications will allow transmission of great amounts of information, may eliminate the need to co-locate an AOC in the theater of operations, and will transform AOCs from hierarchical to network-like operations.<br>**Threat**<br>• Future military technology will be so lethal and devastating that commanders will need to deny the enemy the ability to strike first and/or conduct unencumbered operations.<br>• Counter-access strategies will complicate our ability to support joint and coalition forces.<br>• Adversaries will use their Information Warfare capabilities to deny, disrupt, destroy, or corrupt our C2 information and information systems. | • Denies an adversary the benefit of planned operations/mission execution<br>• Provides ability to project power with minimal losses<br>• Allows commanders to dictate pace of battle<br>- Enhances our capability to conduct asymmetric warfare<br>- Provides the ability to execute missions inside the near-peer adversary's decision cycle<br>• Provides precision knowledge to commanders, allowing them increased influence in the information domain and battlespace<br>- Provides accurate, effective, timely assessment of all events essential to consistent battlespace understanding<br>- Focuses sensors and surveillance assets on priority targets<br>- Enhances ability to produce a range of desired effects<br>- Provides automated, interactive cross-cueing of targets and detected objects from one joint/multi-national control facility to another<br>• Enables real-time assessment, planning, control, and direction of all aerospace operations<br>- Enables interactive information sharing through distributed/collaborative operations effectively making each command center an extension of all other networked DAC centers<br>- Provides real-time, distributed, collaborative generation and validation of precise targeting information at the appropriate level of security<br>- Provides for dynamic C2 of manned and unmanned vehicles in the same aerospace environment<br>- Provides the option to deploy forward a much smaller tailored AOC within days<br>• Provides the global, interoperable, inherently protected, and high-throughput communications capability (e.g., Global Information Grid-AF) necessary for information access and bandwidth<br>• Provides BM/C2 system to enable real-time assessment, planning, control and direction of all aerospace operations from a remote/dispersed location (reachback) with capability, if necessary, to forward deploy a tailored AOC within days<br>- Shortens and improves the planning, decision making, and operational execution functions of the C2 cycle while increasing its interoperability<br>- Quickens response to contingencies<br>- Reduces need to assemble maneuver formations<br>- Enhances ability to produce a range of desired effects<br>- Provides for dynamic C2 of manned and unmanned vehicles in the same aerospace environment<br>- Establishes AOC as a weapons system |

## COMMAND AND CONTROL
## Critical Future Capability #1 (Continued)

| Enabling Technologies | CONOPS Relationship |
|---|---|
| • Sensor and data fusion<br>• Battle management decision aids<br>• Joint battlespace infosphere technologies<br>• Command and control for integrated manned and unmanned vehicles<br>• Cartographic exploitation technology<br>• Visualization systems<br>• Intelligent agents<br>• Knowledge bases and extraction tools<br>• Distributed mission training<br>• Dynamic effects-based operations | • It is the command and control element that will devise and tailor the appropriate CONOPS for any given scenario. |

# Glossary

**ACTD.** Advanced Concept Technology Demonstration

**AEF.** Aerospace Expeditionary Force

**AFDD.** Air Force Doctrine Document

**AFPP.** Air Force Program Projection

**AFSP.** Air Force Strategic Plan

**AOC.** Aerospace Operations Center

**APOM.** Amended Program Objective Memorandum

**APPG.** Annual Planning and Programming Guidance

**ARC.** Air Reserve Component

**ATD.** Advanced Technology Demonstration

**ATO.** Air Tasking Order

**BDA.** Battle Damage Assessment

**BLOS.** Beyond Line of Sight

**BM/C2.** Battle Management Command and Control

**BoD.** Board of Directors

**C2.** Command and Control

**C4I.** Command, Control, Communications, and Computers, and Intelligence

**C4ISR.** Command, Control, Communications, Computers, and Intelligence, Surveillance, and Reconnaissance

**CBW.** Chemical, Biological Warfare

**CFC.** Critical Future Capability

**CINC.** Commander in Chief

**CONOPS.** Concept of Operations

**CONUS.** Continental United States

**COTS.** Commercial Off the Shelf

**CRAF.** Civil Reserve Airlift Fleet

**CSAF.** Chief of Staff, United States Air Force

**CSAR.** Combat Search and Rescue

**DAC.** Dynamic Aerospace Command

**DE.** Directed Energy

**DEW.** Directed-Energy Weapon

**DL.** Distributive Learning

**DPG.** Defense Planning Guidance

**DRU.** Direct Reporting Unit

**EAF.** Expeditionary Aerospace Force

**EO.** Electro-Optical

**F2AT2E.** Find, Fix, Assess, Track, Target, and Engage

**FID.** Foreign Internal Defense

**FTF.** Future Total Force

**FOA.** Field Operating Agency

**HAF2.** Headquarters Air Force

**HUMRO.** Humanitarian Relief Operations

**ICE.** Intelligence Collaborative Environment

**ID.** Identification

**IO.** Information Operations

**IR.** Infrared

**ISR.** Intelligence, Surveillance and Reconnaissance

**ITV.** In Transit Visibility

**IW.** Information Warfare

**IIW.** Information In Warfare

**JEFX.** Joint Expeditionary Force Experiment

**JFACC.** Joint Forces Air Component Commander

**JFC.** Joint Force Commander

**JPD.** Joint Planning Document

**JV.** Joint Vision

**JWS&T.** Joint Warfare Science and Technology

**LACM.** Land Attack Cruise Missile

**LRPG.** Long Range Planning Guidance

**MAF.** Mobility Air Forces

**MAJCOM.** Major Command

**MAP.** Mission Area Plan

**MET.** Mission Essential Task

**MPP.** Modernization Planning Process

**MSP.** Mission Support Plan

**MTW.** Major Theater War

**NBC.** Nuclear, Biological, and Chemical

**NCA.** National Command Authorities

**O&S.** Operations and Support

**OJT.** On the Job Training

**OPSEC.** Operational Security

**OPTEMPO.** Operations Tempo

**OTH.** Over The Horizon

**PERSTEMPO.** Personnel Tempo

**PME.** Professional Military Education

**POM.** Program Objective Memorandum

**PSYOP.** Psychological Operations

**QDR.** Quadrennial Defense Review

**R&D.** Research and Development

**RDT&E.** Research, Development, Test, and Evaluation

**RC.** Reserve Component

**RF.** Radio Frequency

**RMA.** Revolution in Military Affairs

**S&T.** Science and Technology

**SECAF.** Secretary of the Air Force

**TACC.** Tanker Airlift Control Center

**TBM.** Theater Ballistic Missile

**TF.** Total Force

**TPED.** Tasking, Processing, Exploitation, and Dissemination

**USAF.** United States Air Force

**WMD.** Weapons of Mass Destruction

# Reference Material

Aerospace C2ISR Campaign Plan 2000

Air Force Doctrine Document 1

Air Force Posture Statement

Air Force Strategic Plan, Volumes 1 and 2

Air Force Vision 2020, America's Air Force: Global Vigilance, Reach and Power

Defense Planning Guidance

Joint Strategy Review

Joint Vision 2020

National Military Strategy

National Security Strategy

The Quadrennial Defense Review

# APPENDIX: National Strategy

## Goals and Objectives

Military power is an instrument of U.S. statecraft in peace, crisis, and war. As such, military capabilities must be tailored to meet U.S. goals and objectives, particularly those related to preserving the security of the Nation. The goals and objectives cited below are drawn from the U.S. Constitution, the national security strategy, and the national military strategy. The first step in Air Force planning for future capabilities is to determine what demands these goals and objectives will place on its Core Competencies, people, infrastructure, and innovation as the Air Force organizes, trains, equips, and provides forces to carry out its functions in support of joint missions.

## Enduring National Goals

The national security strategy is designed to meet the fundamental purposes set out in the preamble to the U.S. Constitution:

*…provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity…*

These enduring American goals translate into the following current security requirements:

- Protect the lives and personal safety of Americans, both at home and abroad;
- Maintain the sovereignty, political freedom, and independence of the United States, with its values, institutions, and territory intact; and
- Promote the well-being and prosperity of the Nation and its people.

These requirements are standards, or national interests, for U.S. action. The national security strategy states that we will do what we must to defend these *vital* interests—those of broad, overriding importance to the survival, safety, and vitality of our Nation. If necessary, we will use U.S. forces to defend these interests unilaterally and decisively.

## National Security Objectives

*A National Security Strategy for a New Century* (December 1999) states the President's strategic priorities:

- Promote peace and security in key regions of the world;
- Create more jobs and opportunities for Americans through a more open and competitive trading system that also benefits others around the world;
- Increase cooperation in confronting security threats to our critical infrastructures and our citizens at home and abroad;
- Strengthen international arms control and nonproliferation regimes;
- Protect the environment and health of our citizens; and
- Strengthen the intelligence, military, diplomatic, and law enforcement tools necessary to meet these challenges.

The national security strategy states that European stability is vital to our own security. The U.S. and Japan bilateral security relationship remains the cornerstone for achieving common security objectives for the Asian-Pacific region in the early 21st century. A stable, open, prosperous People's Republic of China is clearly and profoundly in our interests. The United States has enduring interests in pursuing a just, lasting, and comprehensive Middle East peace, ensuring the security and well-being of Israel, helping our Arab friends provide for their security, and maintaining the free flow of oil. In Southwest Asia, the United States remains focused on deterring threats to regional stability and energy security, countering threats posed by weapons of mass destruction (WMD), and protecting the security of our regional partners, particularly from the threats posed by Iraq and Iran.

Many of our security objectives are best achieved—or can only be achieved—by leveraging U.S. influence and capabilities through international organizations, U.S. alliances, or as the leader of an ad hoc coalition formed to pursue a specific objective. This is especially true if the stakes involved in pursuing an objective are less than vital to the United States. If an objective does not fit the criterion of a vital national interest, it may fit the category of an *important* national interest. These interests do not affect our national survival, but they do affect our national well being and the character of the world in which we live. Examples are regions in which we have a sizable economic stake or commitments to allies, protection of the global environment from severe harm, and crises with the potential to generate substantial and highly destabilizing refugee flows. The third category of interests is *humanitarian and other*. In some circumstances, the United States may act because our values demand it. Examples include responding to natural and man-made disasters, seeking to halt gross violations of human rights, and supporting democratization, adherence to the rule of law, and civilian control of the military.

## Elements of National Military Strategy

The *National Military Strategy* (1997) provides advice from the Chairman of the Joint Chiefs of Staff, in consultation with the Joint Chiefs of Staff and the combatant commanders, to the National Command Authorities (NCA) on the strategic direction of the Armed Forces. The national military strategy describes the strategic environment, develops national military objectives and the strategy to accomplish them, and describes (broadly) the military capabilities required to execute the strategy.

U.S. military objectives are:

- *Promote peace and stability.* Ensure that no critical region is dominated by a power hostile to the United States and that regions of greatest importance to the United States are stable and at peace.
- *Defeat adversaries.* In the event of armed conflict, U.S. Armed Forces will render an adversary incapable of armed resistance through destruction of that adversary's capacity to threaten our interests or by breaking that adversary's will to do so. We will endeavor to commit decisive force to ensure that we achieve the objectives established by the NCA and conclude hostilities in the shortest time possible and on terms favorable to the United States.

U.S. Armed Forces pursue these objectives by applying military power as directed to help shape the international environment and respond to the full spectrum of crises while also preparing now for an uncertain future. These are the elements of the national military strategy.

**Shaping the international environment.** U.S. Armed Forces help shape the international environment through deterrence, peacetime engagement activities, and active participation and leadership in alliances. Critical to deterrence are our conventional warfighting capabilities and our nuclear forces.

**Responding to the full spectrum of crises.** The U.S. military will be called upon to respond to crises across the full range of military operations, from humanitarian assistance to fighting and winning major theater wars, and conducting smaller-scale contingencies. Our demonstrated ability to rapidly respond and to decisively resolve crises provides the most effective deterrent and sets the stage for later operations if force must be used. Should deterrence fail, it is imperative that the United States be able to defeat aggression of any kind. Especially important is the ability to deter or defeat nearly simultaneous large-scale, cross-border aggression in two distant theaters in overlapping time frames, preferably in concert with allies.

**Preparing now for an uncertain future.** It is imperative that the United States maintain the military superiority essential to its global leadership in the early 21st century. This

continued prowess requires a transformation of doctrine and organizations and a stabilized investment program in robust modernization that exploits the revolution in military affairs. It also requires fundamental reengineering of our infrastructure and streamlining of our support structures through the revolution in business affairs to realize the cost efficiencies necessary to recapitalize the force.

The U.S. military must have capabilities that give the national leadership a range of viable options for promoting and protecting U.S. interests in peacetime, crisis, and war. The Armed Forces provide the NCA with several equally important capabilities:

- Strategic deterrence;
- Decisive operations (gaining the initiative quickly);
- Special operations;
- Forcible entry (the ability to go anywhere that U.S. interests require);
- Force protection;
- Countering WMD;
- Focused logistics (leaner and more agile forces); and
- Information operations (IIW and IW).

A number of assets—strategic enablers—are critical to the worldwide application of U.S. military power and military strategy:

- People;
- Robust all-source intelligence;
- Global command and control;
- Air and sea control (dominance of these mediums);
- Space control (ensure freedom of action and, if directed, deny such freedom to adversaries); and
- Strategic mobility.

We cannot know with certainty who our foes will be or where our forces will be needed in the future. In a time of both uncertainty and promise, the national military strategy and U.S. Armed Forces provide the Nation with the means to protect our interests and promote a peace that benefits America and all like-minded nations.