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# AMERICA'S AIR FORCE: A CALL TO THE FUTURE

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# FOREWORD



Airmen and Airpower Advocates:

As the 23rd Secretary of the United States Air Force, I enter each day both prouder and more humble than the day before. The unparalleled courage, commitment, and creativity our Airmen exhibit in overcoming the challenges we face daily leave even the most ardent skeptics optimistic about the future. As we proudly serve in the world’s greatest Air Force, the Chief of Staff and I have a responsibility to prepare the institution for the path ahead to ensure we can continue to provide effective and responsive *Global Vigilance—Global Reach—Global Power* for America well into the future. With this in mind, I wholeheartedly endorse this “Call to the Future,” and commend it to every Airman as our strategic path for the next 30 years.

From the moment I took this office, I have doggedly pursued my three priorities, and will do so until my last day in office. However, I know the issues will last beyond my tenure and are therefore woven into the key themes and vectors contained in this document. While we work today to *develop and care for Airmen and their families*, this strategy lays the path for developing the structure, strengthening the culture, and creating development opportunities that will attract tomorrow’s Airmen and families. *Balancing readiness and modernization* is a perpetual dilemma, but especially so with some of our current paradigms. This strategy challenges our Air Force to forge ahead with a path of strategic agility—breaking paradigms and leveraging technology just as we did at our inception. This will provide the ability to field the full-spectrum capable, high-end focused force of the future. Finally, *making every dollar count to ensure a credible and affordable force* is also enabled through agility—in the way we acquire and field weapon systems as well as through taking a multi-domain approach to our core missions.

This document is not only a call to the future, but indeed a call to action. The words contained within do not advocate a “stay the course” mentality. Rather, they challenge us—all of us—to show the courage to change in the face of uncertainty, all the while strengthening the many advantages we currently enjoy. Luckily, we don’t have to bear the full burden of flying solo on this journey into the future. We are blessed with tremendous teammates—from OSD, Congress, industry, joint, interagency, international partners, and others. Strengthening those partnerships will provide the mutual support we need to boldly step into the future and shape our own destiny. We are ever mindful that we don’t pursue this destiny for the greater glory of our Air Force. We are first and always a service, and we are only successful if what we provide appropriately contributes to the security of this great Nation. This document sets the course, and I look forward to leading—but more importantly, serving with—our outstanding Airmen on this journey.



*Deborah Lee James*  
DEBORAH LEE JAMES  
Secretary of the Air Force

# FOREWORD



Airmen and Airpower Advocates:

Over the past 18 months, we released two foundational documents to help us define the United States Air Force for the twenty-first century. The first, *America's Greatest Air Force – Powered by Airmen, Fueled by Innovation*, describes who we are—an exceptional team of innovative Airmen, grounded in our Core Values, superbly trained and equipped to execute our five core missions. The second document, *Global Vigilance, Global Reach, Global Power for America*, describes what we do. Understanding the importance of airpower now and well into the future, this paper details our core missions and how—through the skill, commitment, dedication, and leadership of our Airmen—we provide enduring contributions to American security.

Building upon “who we are” and “what we do,” this *Strategy* provides a general path of “where we need to go” to ensure our Air Force meets the needs of our great Nation over the next 30 years. This is an aspirational document, providing an “over the horizon” sight picture and delivering strategic vectors that describe how the Air Force needs to look and act as we move towards a dynamic future. This long look guides the 20-year *Strategic Master Plan*, which identifies priorities, goals, and objectives that align our planning activities with strategic vectors to produce a resource-informed 20-year planning force. This *Strategic Master Plan* gives us the opportunity to reassess the environment, adjust strategic vectors based on the predicted changes, and make course corrections before decisions arrive within the budget horizon. Through an annual *Planning Choices* event, we will update this planning force, putting particular emphasis on balancing the next 10 years in light of fiscal projections.

This *Strategy* is not just about resources and investment choices. In fact, our ability to thrive in the future environment and provide responsive and effective *Global Vigilance—Global Reach—Global Power* is as much about our structure, people, and processes as our purchases. Uncertainty will always accompany strategy development, and the rate at which the strategic environment can shift complicates the task even further. As the pace of change across the globe quickens, many of our processes and paradigms will be made obsolete. ***The Air Force's ability to continue to adapt and respond faster than our potential adversaries is the greatest challenge we face over the next 30 years.*** We must pursue a strategically agile force to unlock the innovative potential resident in our Airmen and turn a possible vulnerability into an enduring advantage. We owe it to our Airmen, our Air Force, and our Nation.



*Mark A. Welsh III*  
MARK A. WELSH III  
General, USAF  
Chief of Staff



# INTRODUCTION

*Any Air Force which does not keep its doctrines ahead of its equipment,  
and its vision far into the future, can only delude the nation into a false sense of security*

General Henry H. “Hap” Arnold  
Commanding General, USAAF  
November 1945

Though General Arnold penned those words nearly seven decades ago, they remain relevant today. In fact, that time in history parallels our own in many ways. In 1945, the United States had just emerged from a sustained conflict and was engaged in an international environment that required our continual global leadership. The military was drawing down in the wake of the defeat of the Axis powers. All of this was occurring as the clouds of an uncertain and potentially dangerous future were gathering. Then, like now, some things were crystal clear. Among them, that force will remain an essential component of national security, and that airpower possesses unique and desirable attributes as a form of military power. General Arnold recognized looking forward – well forward – was the best way to own the uncertain future and avoid being a prisoner of it. We can neither ignore the immediate challenges, nor be consumed by them. Instead, we must set a course that navigates beyond the existing obstacles and steps boldly into the future.

Any coherent path to the future must begin with a single common, clear understanding of purpose. Our purpose is ***to ensure the Air Force can always provide responsive and effective Global Vigilance—Global Reach—Global Power.*** These are what we deliver to the nation in peacetime and war. We are the globally responsive force – always ready. We measure our responsiveness in minutes and hours, not weeks or months. We deliver these contributions through unmatched execution of our five core missions: *air and space superiority; intelligence, surveillance, and reconnaissance; rapid global mobility; global strike; and command and control.* Though the portfolios within these mission sets have expanded to include the space and cyberspace domains, the heart of these missions remains unchanged since President Truman assigned them in 1947. Courageous Airmen have forged the evolution and refinement of these core missions with their blood and sacrifice, ensuring they will endure long into the future.

The effects our Airmen create through our five core missions are the prerequisite for successful joint operations. In some cases, this is through the precision of a strategic strike, the protective umbrella of air superiority, or the unseen persistence of our space constellations. Our reliable rapid global mobility shrinks the planet, and our dominant ISR capabilities enhance awareness for joint force commanders. The connective tissue of our preeminent command and control provides unmatched integration of joint forces. Whether we are in a leading or supporting role, every service needs something from the US Air Force to succeed. Put simply, our capabilities underwrite our nation’s security. This is a responsibility we value, and will always hold sacred.

With *Global Vigilance—Global Reach—Global Power* as our underlying purpose, the aim of this document is to project into the future – considering global trends and the environments they might create – to generate future opportunities for us to exploit while ensuring we take steps to overcome the greatest threats along the way. This is as much art as science to be sure, but a necessary exercise and one we owe to those who will follow us.





# STRATEGIC CONTEXT

## THE EMERGING GLOBAL ENVIRONMENT

While any attempt to describe the world thirty years in the future will inevitably come up short, emerging global trends help establish a context to inform strategic choices. For our purpose, we anticipate several overarching trends shaping the environment in which the Air Force will operate. More broadly, these four trend areas highlight national security challenges that airpower is well suited to address.

An increasing number of *rapidly emerging technological breakthroughs* will yield more opportunities for geostrategic game-changers. For example, the maturation of hydraulic fracturing technology (“fracking”) has fundamentally altered the global energy equation. The portability of information-sharing technology has enabled disaggregated communities to self-organize and threaten unstable governments. As the future unfolds, an increased awareness of the opportunities and threats created by disruptive technological change is vital, particularly the implications these changes have for geopolitical balance.



New technologies will also provide opportunities to quickly alter the economic fortunes of a country or a region, solving existing problems while generating new ones. A resulting imbalance in global economic growth, coupled with global interdependence and increasing resource demands of rising powers will make *geopolitical instability* the second trend we can expect to endure over the coming decades. Nuclear proliferation will continue to complicate the international power balance. As power centers shift, our ability to leverage specific partners and dissuade specific adversaries will have a shorter lifespan. While the United States will strive to remain first among equals, other nations will rise to challenge global powers and achieve near-peer status. Therefore, preparing for a threat based solely on current geopolitical realities will be insufficient.

The range of potential adversaries and missions will broaden due to rising geopolitical instability, resulting in a *wide range of operating environments* in which the Air Force will execute its missions. The proliferation of long-range precision strike weapons will allow any location on earth to be held at risk, creating global engagement zones; and airspace will be contested by increasingly advanced integrated air defense systems. On the opposite end of the spectrum, developing countries in low-infrastructure areas will struggle to provide their populations with basic necessities. This environment fosters instability which will inevitably lead to humanitarian crises and lawless areas where illicit groups and individuals can thrive.

*Increasing importance and vulnerability of the global commons* will also shape the environment of the next 30 years. The air domain is recognized as an indispensable medium for personnel travel, and the global percentage of high-value cargo movement by air continues to rise – it’s currently at 35%. Space will continue as a vital domain for the global economy, as it provides critical communications; position, navigation, and timing data; and imagery that have opened the door to remarkable advancements. We can expect this domain to become further congested, and be contested by ever-increasing counter-space capabilities. Cyberspace will only grow as the recognized domain through which critical information must flow at ever-increasing volume and speed. As the global community increases its dependence on access to these commons and freedom within them, their vulnerabilities will invite actions with potentially disastrous worldwide consequences. Accordingly, the demand for ensuring confidence in the integrity of these commons will increase in the years ahead.





# THE CHALLENGE

The four strategic trends of the emerging global environment warrant scrutiny, but there is a characteristic common to all that multiplies their significance – *speed*. The pace of change has quickened substantially since the Air Force’s inception, but it has picked up most dramatically over the last two decades. We believe *rapid change* is the new norm and has serious implications for the Air Force. The pace at which disruptive technologies may appear and proliferate will result in operational advantages that are increasingly short-lived. Dynamic and increasingly frequent shifts in the geopolitical power balance will have significant implications for basing, posture, and partner capabilities that may favor flexibility over footprint. Similarly, more rapid changes that challenge access through – and freedom within – the air, space, and cyberspace commons will demand continual attention and emphasis on identifying multiple domain options rather than robust approaches within a single domain.

Uncertainty has always been a part of strategy development, and though we anticipate the pace of change to continue unabated through the next 30 years, rapid change need not be a threat. While it will clearly be a vulnerability to those unable to adapt, it also becomes an enduring advantage to the agile. *The Air Force’s ability to continue to adapt and respond faster than our potential adversaries is the greatest challenge we face over the next 30 years.*

Meeting that challenge will require honest, recurring self-critique, and a willingness to embrace meaningful, perhaps even uncomfortable change. To their great credit, our Airmen – adaptive and resilient – are bridging the widening gap between the dynamic 21st-century environment and our 20th-century bureaucracy. Their initiative and perseverance allow us to succeed in our mission despite sluggish process and cumbersome structure that can engender rigid thinking and stifle the creativity and innovative spirit we seek to champion. *We must commit to changing those things that stand between us and our ability to rapidly adapt.* We owe our Airmen and our nation an institution that can unlock our potential to thrive in the environment ahead.

“The quickening pace shouldn’t generate the belief that the tide of events is beyond your control. No, you should be confident that with wisdom, responsibility, and care you can harness change to shape your future.”

*-President Ronald Reagan*

To capitalize on this increasingly dynamic environment, the Air Force must aggressively pursue a path toward institutional *strategic agility*. In the context of this strategy, the term “agility” is meant to capture the attributes of flexibility, adaptability, and responsiveness. Flexibility is an enduring attribute of airpower; and adaptability – of our Airmen, organizations, operational concepts, and weapon systems – has long underwritten that flexibility. It is the element of speed – the pace of change – that drives the imperative for agility. This implies anticipation over reaction, shaping over responding. “Strategic” in this context refers to the national security implications of how we organize, train, equip, and employ our Air Force.

Embracing strategic agility will enable us to “jump the rails” from our current path of 20th-century, industrial-era processes and paradigms. It is foundational to our ability to continue providing the United States with effective security and influence through *Global Vigilance—Global Reach—Global Power* beyond 2045.







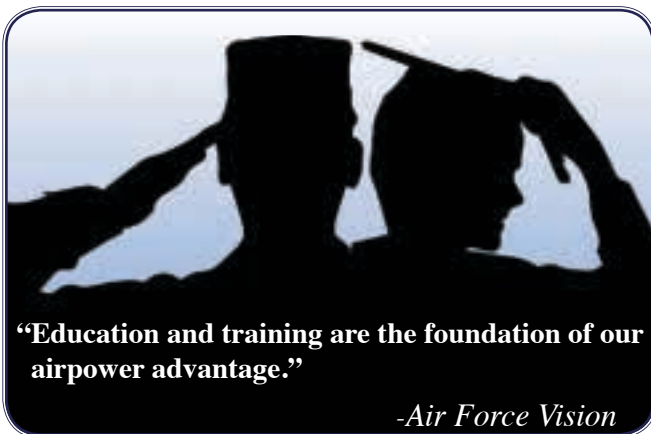
# THE AIR FORCE WE NEED

## AGILE AND INCLUSIVE

**AGILITY** is the counterweight to the uncertainty of the future and its associated rapid rate of change. We learned from sequestration that our brittle system often leads to suboptimal decisions that are difficult to reverse. Huge, long-term programs limit our options; we are too often left with “all or nothing” outcomes and “double or nothing” budget decisions. We must transform into a more agile enterprise to maintain our edge in the emerging environment and leverage the full innovative potential resident in all our Airmen. This characteristic must permeate every level of our Air Force, but the requirement is particularly acute in the following areas:

### DEVELOPMENT AND EDUCATION

Innovative Airmen power the Air Force, and their development starts the day they enter the service. Though we are often viewed as the service most associated with technology, we know that our ability to recruit and retain exceptional Airmen is the cornerstone of our business. Historically, we have enjoyed great success in recruiting high quality people into our force, but we can ill afford to assume that the methods of the past will be sufficient in the future. As we look to the dynamic environment ahead, we must identify and recruit those who possess the character, skills, education, and aptitude to thrive in this setting. These are not only technical skills, but also critical thinking, adaptive behavior, and diversity of thought. Identifying those traits will require a more nuanced approach, but if we are to develop Airmen to effectively lead the Air Force into the future, we must start with the right “raw material.”



Developing the Airmen of the future will also entail maturing them along career paths that may not follow the well-trodden ones of old. Our model of twenty years of continual service in the same “company” is a 20th-century construct that is not widely replicated in the private sector. Without a more creative concept for continuum of service, we may find ourselves out of step and face more difficulty retaining the creativity and innovation in leadership we will require at all levels. For example, breaks in service – or transitions between full-time and part-time – need not be punitive in the advancement of our future Airmen. Rather, the experience they gain during their time out of uniform should be recognized for the broader perspective it delivers. Similarly,

we must commit to a career development model that provides those in specialized career fields with incentives and promotion opportunities on par with those in more mainstream disciplines. This will require a more sophisticated, tailored approach – one more complex to be sure. However, the reward will be a new breed of Airmen and leaders who exhibit diverse ways of thinking and collectively provide the foundation of a more innovative Air Force culture.

To maintain superior agility in the future, the education and training of our Airmen must be relevant and responsive. The Air Force must embrace the concept of life-long learning, which draws meaningful connections between the discrete educational experiences throughout a career. The science of education is changing before our eyes, and we can expect that our children will receive a fundamentally different experience in primary education than we did. For example, information technology is producing new delivery methods that can tailor the pace of study in different subjects to the students’ strengths and weaknesses, ensuring more effective learning through their continuum of education. The Air Force must mirror the new content and delivery methods that are becoming available to our youth. Failure to do so can yield “negative learning” and slow the development of our Airmen.





## CAPABILITY DEVELOPMENT

In an environment where rapid change is a fact of life, our current capability development paradigm is inadequate. Large, complex programs with industrial-era development cycles measured in decades may become obsolete before they reach full-rate production. The system is cumbersome, as the cost and complexity of these large programs draw additional layers of oversight and scrutiny. We must begin designing agility into capability development now. Doing so will require an ever-closer relationship between our Science & Technology (S&T), acquisition, and requirements disciplines.

“...for our national security in a period of rapid change will depend on constant reappraisal...on alertness to new developments, on imagination and resourcefulness, and new ideas.”

*-President John F. Kennedy*

A commitment to capitalize on the most promising S&T breakthroughs will expand the aperture when we consider future capabilities. We must couple this commitment with a requirements process and acquisition system that accommodates more frequent “pivot points” – opportunities to modify or abandon a program during its life cycle – and harnesses rapid prototyping to reduce resources required to bring a design idea into service. Such a system will provide the flexibility to address evolving challenges in multiple ways. At some points, technology will drive the development of new concepts, and in other cases the reverse may be true. Regardless, the ability to integrate the best technological advances in stride, and abandon underperforming elements of a system will accelerate development of the capabilities we need to maintain our edge into the future.

To the extent that our current policies and regulations can be modified to change the paradigm from large, complex programs rife with crippling interdependencies to programs with simple, severable components, open architectures, and more distributed participation, we will enact those changes. We will improve our ability to orchestrate the development and integration of distinct elements of a capability. The new disciplines required of our Air Force are that of integrator and synchronizer – directing how and when the elements must fit together. As we increasingly elevate affordability as a key attribute of future acquisitions, we should look to the commercial industry for insights. The profit motive that drives the private sector forces increased competition--along with innovative acquisition and development processes--into business models as a matter of survival. We will carefully evaluate these practices for application in our procurement processes. By building systems that are capable, affordable, and exportable, we can simultaneously strengthen our defense capabilities at lower cost and create greater transparency and interoperability with our most trusted allies and partners. For those areas in which external policies, regulations, or laws restrict this effort, we will aggressively advocate and pursue the relief required to enable greater agility.

## OPERATIONAL TRAINING AND EMPLOYMENT

As we develop new capabilities, we must be prepared to field them as soon as they are safe and effective. Including modularity in our development will enable us to more easily integrate early operational discoveries and shrink the time horizon between system inception and system maturity. An effective weapon system in the hands of innovative Airmen is incredibly powerful. Those who operate the systems in the field continue to discover uses that designers never imagined. We must strengthen this feedback loop, and rapidly validate operating concepts developed in the field and disseminate them force-wide. We will create the operations and training environment that preserves the standards and discipline that have made us the best-trained force in history, but also provide the climate for innovation to thrive and push the very best tactics, techniques, and procedures into execution more rapidly.

We must also pursue ways to streamline the transition to mission readiness along the spectrum of conflict. We have suffered the effects of necessarily focusing on one mission set for a sustained period of time, and the resulting difficulty of returning to “full-spectrum” readiness. As we design systems and concepts in the future, we must do so with an eye toward the challenge of gaining and maintaining sufficient readiness across all of our mission sets in minimum time. Equally important, we must seek to drive down costs. Looking for commonality in training elements will enhance





this effort. One of the more promising paths to agility in operational training and readiness is in the area of Live—Virtual—Constructive training. Technological advances have moved simulation well-beyond the rudimentary motion and visual displays designed to augment procedural and navigation training, and now enable integrated and linked training between geographically separated simulators. Free from the constraints of the physical realm, we can develop virtual environments – airspace, ranges, etc. – that deliver robust, realistic training against existing threats as well as those we anticipate in the future. These environments can serve as the proving ground for multi-domain operations and a laboratory for assessing emerging capabilities. The integration of this virtual environment with physical systems will expand opportunities to include complex mission employment scenarios – currently reserved for episodic and costly exercises. Virtual systems also carry with them a different operations and sustainment paradigm. Much of the cost associated with these systems is in the supporting infrastructure. Consequently, by applying modularity to our concept for virtual training systems, we can develop simulation platforms that can be “removed and replaced” into a common architecture. Such a construct will provide training flexibility and offer the opportunity for regional simulation centers, mitigating the cost of building multiple, duplicative structures at every installation.



## ORGANIZATIONS

We must exploit advances in automation to create a leaner, more efficient force. We can increase our organizational productivity by taking full advantage of the opportunities afforded by technology. Virtual tools and collaborative environments currently in existence offer the promise of efficiency in administrative work and decision support across multiple organizations. We must commit to new processes and organizational behavior necessary to realize those efficiencies. These processes can lead to faster decision making without sacrificing quality. The future organization must enable the Air Force to push decisions and execution to the lowest informed level in the chain of command. The goal is flatter and more agile organizations that minimize administrative drag and maximize combat power.

One universal truth about successful innovation is that it is inextricably linked to the risk of failure – and cannot truly exist without it. A key goal of an organization striving to innovate is to lower the cost of failure, and ensure that each failure results in learning on the journey to eventual success. By driving timelines, cost structures, and architecture toward smaller, simpler programs, we can distribute risk and provide opportunities for innovation in capabilities development. Similarly, incentivizing smart risk-taking and rewarding constructive failure in our Airmen lowers the barrier within organizations for new ideas. This philosophy will surely become a catalyst for innovation, and ultimately provide better answers to future national security challenges.

The creation of an agile Air Force is a long-term and deliberate process that will require sustained discipline and energy. This is an area in which we cannot merely dabble – we must fully commit ourselves to all aspects of this endeavor. Success in one area strengthens the others, and the shortcomings of one will propagate throughout the enterprise. The ability to make these changes also hinges on the Air Force’s ability to build a stronger team – inclusive of all relevant parties.

## INCLUSIVENESS – “NONE OF US IS AS SMART AS ALL OF US.”

Simply stated, inclusiveness is about harnessing every possible resource to ensure we are delivering the world’s most powerful Air Force – something the nation expects and deserves. Tremendous capacity exists within and outside of our Air Force that needs to be woven into our fabric as we move forward. Three key ways of making this happen are strengthening the structure of the Air Force team, ensuring a character-based, diverse culture, and developing robust partnerships outside our Air Force.





## AIR FORCE STRUCTURE

Throughout the history of the all-volunteer force, the barriers between the reserve and active components of the Air Force have become more permeable. We have evolved from a position of strategic reserves called upon for increased capacity to the current reality in which all components are fully engaged and operationally indistinguishable. Through this evolution, the Total Force has become stronger. It can – and must – be stronger still.

Put simply, our goal is to render obsolete the need for the term “Total Force” – but maintain its premise. This can only be considered a success when the lines have blurred sufficiently to optimize Active, Guard, and Reserve contributions (both uniformed and civilian) to the Air Force mission, while recognizing and leveraging their unique characteristics. As an example, right now the enduring relationship between the Airmen in the Air National Guard and Air Force Reserve and their community and political leaders is a strength of the reserve component. In the future, this needs to be well-understood as a strength of the Air Force as a whole. We are the US Air Force – making each of us strong makes all of us strong.



When we are functioning as one Air Force, the structure across Active, Guard, Reserve and civilian elements of the Air Force provides increased agility. When we seek to make optimal force structure choices between the active and reserve components, we make those decisions within a particular strategic context. As the context changes, so do the values of the elements of that force mix equation – access, cost, tempo, readiness, etc. We will continue to look to our innovative Airmen to develop creative ways to access the force structure and optimize it to meet changing mission demands. But we also need to work with OSD, the National Guard Bureau, state leaders, and the Congress to remove any legal or policy barriers to making common sense decisions on the best operational use of the reserve component in the future.

## AIR FORCE CULTURE

Strengthening the Air Force culture requires capitalizing on the diversity that has made our service so successful, and the attributes that have drawn Americans to serve. Diversity of thought, enabled by an organization of innovative Airmen who represent and are valued for differing backgrounds, cultures, experiences, and highly-specialized competencies contribute to the greater agility we seek.

The Air Force culture that embraces diversity will also fiercely protect character and leadership as its foundational attributes. They will keep us on course in an uncertain and dynamic environment. We will vigorously develop and reinforce these attributes, emphasizing our Core Values, the importance of dignity and respect in the workplace, and a true appreciation of the contributions of all Airmen to our mission. The Air Force must also clearly demonstrate its purpose and culture to a broader audience in American society. By telling the rich story of Air Force heritage, mission, and culture, more Americans will be drawn to serve as Airmen. One of the greatest sources of strength of this country is our diversity, and so it should be for our Air Force.

## PARTNERSHIPS

A strong and diverse Air Force can expand beyond its membership, creating a community of Airmen and supporters that spans the world. We can only leverage the wisdom and perspective outside of our own service if we actively engage in enduring and meaningful relationships. To that end, we will emphasize developing and sustaining partnerships in the following areas:





*Strengthen our relationship with Congress.* Congress has the authority and responsibility to provide the resources for our national security, and we have the responsibility to provide the coherent, consistent, and transparent rationale that underpins our strategic plans and resourcing requests. Confidence comes with trust, and trust and credibility are built through relationships. We will more conscientiously develop and sustain relationships with Congress, and integrate that philosophy into our human capital development.

*Expand relationships with think tanks and academia.* By teaming with think tanks and academia in a more robust manner, we can better collaborate on the leading edge of thought related to our profession, while providing them insight to guide their research paths. Exposure to these diverse perspectives will only enrich our understanding of threats and opportunities facing our Air Force.

*Develop a broader relationship with industry.* A habitual dialogue with industry – at every level – to improve understanding of requirements and enhance competition builds a better Air Force-industry team. Industry is, and will continue to be, fertile ground for cutting-edge technological development and organizational agility. A strong relationship will expose and remedy areas in which our processes and rule sets may unintentionally be inhibiting industry’s ability to provide us with more creative solutions. As we continue to strengthen existing industry partnerships, we will also seek out non-traditional teams who are leading in the areas of innovation and agility. Partnerships at the senior level should be based upon a shared commitment to solve challenges common to both the Air Force and our industry partners, supported by aggressive goals and tangible objectives.

*Strengthen the joint and interagency team.* Operations in Iraq and Afghanistan have created a level of combat-earned trust that we must sustain. As current combat operations wind down, training and exercise opportunities that enhance that trust across the joint force are critical. Our Battlefield Airmen have fought and died beside our sister service forces, and through that integration have developed both the enduring relationship and a perspective that is indispensable to our Air Force and the nation.

As a service, we have gained significant experience and learned valuable lessons on leading people and integrating capabilities across joint operations. Our steadfast goal will be to build upon these lessons and weave them into our DNA. This will ensure a more comprehensive understanding of the synergy attained through the integration of air, space, and cyberspace capabilities with those of our joint partners.

In addition, as we expect our operating domains to have increased strategic impact in the 21st-century, Airmen will be the most appropriate choice to lead many joint operations. Leveraging the lessons and experience of the current generation of Airmen will be instrumental to success in that joint leadership role.

The challenges the Air Force will face in a rapidly changing environment will be no less daunting for our interagency partners. Complex security issues will require more creative “whole of government” approaches and flexible partnerships. Remaining in step and aware of the evolving strengths and limitations of the varied agencies at all levels of government will be vital to ensure we advance our unique Air Force capabilities in a way that best provides for the nation’s defense.

*Sustain alliances and strengthen new partnerships.* We are a global Air Force with global responsibilities. Whether maintaining long-proven alliances and coalitions or seeking new partnerships, the Air Force must increasingly look internationally to effectively deliver *Global Vigilance—Global Reach—Global Power*. Partnerships enhance deterrence, build regional stability, offset costs, increase capability and capacity, and ensure access. Indeed, the most likely and most demanding scenarios involve the Air Force working in concert with, or leading, coalition Airmen. We must accordingly invigorate our commitment to international like-minded Airmen who can build and sustain global partnerships. The return on purposed, strategic partnering is a growing, more capable team of air forces better empowered to provide for their own security, and agile enough to integrate into an effective fighting force.





# STRATEGIC VECTORS FOR THE FUTURE

An agile and inclusive organization better positions our Air Force for success in the uncertain, rapidly changing environment of the future. However, we fully recognize that the pursuit of agility does not relieve us of the responsibility to make choices, or lay down investment “bets” on future capabilities. In fact, agility offers the opportunity to place more bets, because they are less costly at their inception and manageable throughout development and employment. As we determine the areas of strategic emphasis, enabled by an agile and inclusive institution, we will narrow our focus to those areas that address the more complex challenges and exploit the most promising opportunities we identify on – and perhaps foresee over – the horizon.



It is important to note that the following vectors are not intended to be a comprehensive representation of our Air Force. On the contrary, *Global Vigilance—Global Reach—Global Power* are three interdependent and mutually reinforcing pillars of our contribution to the nation – none more important than the others, and all requiring due attention. In addition, a myriad of support activities form the foundation for those pillars – not all referenced in the pages that follow. However, without a strong and dependable foundation, the pillars are of marginal value. The foundation consists of all our Airmen – each contributing in an important and powerful way. For the purpose of this document, the vectors below are intended not to exclude, but to help focus as we look to direct our investments, institutional changes, and employment concepts into the middle of the 21st-century.

## PROVIDE EFFECTIVE 21ST CENTURY DETERRENCE

One of the Air Force’s enduring contributions to national defense is maintaining credible and robust strategic deterrence. The sustainment and improvement of the individual nuclear weapons is critical to the success of this deterrent stance and warrants continued emphasis. Improvements in the weapons themselves may offer opportunities for better delivery capability, to include modernized bombers and missiles that will ensure our nuclear mission remains the bedrock of national security. The infrastructure that enables our nuclear mission is also a national treasure. It must be recapitalized where necessary and modernized when needed. The nuclear mission must remain the clear priority of Air Force leaders at all levels.

In the 21st-century, a credible nuclear deterrent is still absolutely necessary, but not always sufficient. The future deterrence landscape is exceedingly more difficult. At the very core of any deterrence analysis is the potential adversary’s perception of the risk versus the reward of a particular action. Recent global and technological trends have complicated this analysis in several ways. First, the diffusion of information and technology (nuclear, chemical, biological, cyber, etc.) has put capabilities with catastrophic consequences into the hands of many more actors. For many of these actors, the threat of a nuclear response is not credible, and thus does not enter into their risk/reward calculus. In addition, many of these potential adversaries are non-state actors. In the current geopolitical order in which nation states are sovereign, developing a credible response to these non-state actors that does not have an escalatory effect is challenging. Another complicating factor is that of attribution – especially in the cyber domain. The fact that virtually any computing device with access to the Internet is a potential weapon offers the perception of anonymity to those contemplating acts that can threaten US interests.





Though this is a broad national security challenge, the Air Force is well suited to significantly contribute to the solution. In the area of attribution, we must continue to pursue multi-domain ISR capabilities that can not only identify the weapon – be it kinetic or non-kinetic – but also the perpetrators and their support networks. Beyond attribution, a robust global ISR capability provides a situational awareness advantage, allowing US leadership more options in dealing with, and averting, potential crises. A modern, globally responsive conventional strike capability complements our nuclear arm and not only underwrites global deterrence, but assures our allies and partners around the world. Readiness of these forces enhances credibility as a deterrent, and thus

will continue to be a prominent priority. With these capabilities at the ready, we must also seek to develop a suite of response options that are as varied as the motivations of the would-be actors. These options will be characterized by precision and proportionality, and will leverage our capabilities in all three of our Air Force operating domains. Only when we have the recognized capability to attribute and appropriately respond can we truly change the risk/reward calculus of the broad range of prospective adversaries and deliver effective deterrence into the future.

One of the most successful deterrence strategies in history was that which ultimately delivered victory in the Cold War. Arguably, the decisive element was the US commitment to a cost-imposing strategy on the Soviet Union. As we seek to develop new capabilities for our Air Force, we will pursue the same strategy, but with a slight twist. Instead of committing vast amounts of national treasure to overwhelm any and all potential adversaries, we will develop innovative, lower-cost options that demand high-cost responses. If it costs markedly less for us to defeat a missile than it does for the adversary to build and launch it, the strategic calculus changes significantly.

## **MAINTAIN A ROBUST AND FLEXIBLE GLOBAL INTEGRATED ISR CAPABILITY**

Throughout the history of warfare, the value of information as both a deterrent and a combat advantage has been well documented. The possibilities made available through recent technological advances have elevated the stature of this element of national security, and drastically increased the demand for it. Maintaining the ability to provide an effective and vigilant stance through broad-area, global ISR and then rapidly transition to more focused warfighter collection requirements demands elasticity in ISR capability. ISR systems, Airmen, and the necessary intelligence community relationships all need to be developed in a way that makes ISR agile and responsive enough to support global and theater requirements in a seamless manner.

“ISR is much more than a support function. It is the foundation upon which every joint, interagency, and coalition operation achieves success.”

*-Global Vigilance, Global Reach, Global Power for America*

Expanding requirements and a growing threat to high cost air-breathing assets will also necessitate a shift from an architecture focused on dedicated ISR platforms to one based on a diverse network of sensors arrayed across the air, space, and cyber domains, placing a premium on the ability to draw data from any and all US systems. This data will originate from a myriad of sources – from multispectral imagery, to recorded and streaming video, to signals intelligence and others. Integration will begin within this automated multi-sensor network which absorbs massive volumes of data, zeroes in on critical elements, and fuses disparate pieces of information into readily exploitable products. This will free analysts to work on less intuitive and more complex higher-order analysis. A robust, survivable, and secure network linking all relevant intelligence sources and operators will be a crucial enabler. The end result will be a more timely, efficient,

flexible, and effective ISR enterprise over the full-spectrum of military operations.

The fusion, integration, and display of this data will be the true force multiplier in the ISR arena, and we must commit to the pursuit of an adaptive paradigm of human-system integration to reach its full potential. Historically, we have addressed information integration from the bottom up – linking stores of data together. If we start from the top down –





or more precisely the “head” down – and *first* determine the cognitive requirements of those at all levels who use the data, the result will be more targeted and precise decision-quality data in much less time. After all, the product of the entire ISR enterprise is actionable knowledge, and that knowledge is most useful if it aids decision-makers in deterring or winning conflicts.



## ENSURE A FULL-SPECTRUM CAPABLE, HIGH-END FOCUSED FORCE

Should deterrence fail, we must be able to fly, fight, and win across the spectrum of conflict. Our responsibility to the nation requires the successful application of our core missions across a broad range of contingencies – some of which do not directly require combat. However, our most challenging scenario is in increasingly contested environments where gaining and maintaining air and space superiority will be our toughest mission – and our highest priority. While success in this environment cannot be at the expense of all lower-end capabilities, our unique and indispensable contribution requires that we posture for the most demanding scenario, not necessarily the most likely. In the early years of our Air Force, a high-end focus left a force structure that was less effective and efficient in conducting combat operations at the lower end of the spectrum of conflict. Clearly, an Air Force with agile capability development and employment will seek to find common systems to deliver maximum effect and optimal efficiency along the spectrum of conflict. As the most significant integrator and enabler for joint operations, we are fully committed to continuing the support we provide the joint force across our core mission areas. Future acquisition programs, training and education must keep that focus clear.

“I’m not interested in a fair fight. And I don’t want to be capable of only fighting the last war.”

-Secretary of Defense  
Chuck Hagel

Our ability to effectively operate in contested environments will require a blended solution. Specifically, we will seek to *increase emphasis on stand-off capabilities while maintaining stand-in resilience*. Stand-off and long-range weapon systems that maximize the speed, range, and flexibility of airpower are increasing in importance. The ability to affect desired targets with enough persistence and precision from long range at low cost can fundamentally alter the equation for success in highly contested environments – and we will continue to develop these capabilities. Execution speed will play an increased role in long range capabilities, as it

not only offers increased survivability but also expands our decision time while reducing our adversaries’ opportunity to react.

Stand-off systems are not the sole solution to the expanding engagement zone of potential adversaries. Future operating bases, at home and abroad, will all be held at some level of risk, and we must not allow stand-off weapons to precipitate a complete withdrawal from important regional locations. To the extent we will conduct sustained operations from within contested environments, we will pursue effective resiliency measures. But we must also adjust our warfighting posture to minimize the force protection bill and lower the risk to critical systems.

Conversely, the work to strengthen resiliency in light of increased risk to basing cannot be at the expense of efforts to enhance our stand-off capabilities. Once again, agility will be critical to meeting the challenges anticipated in the future, and our ability to shift rapidly between “stand-off” and “stand-in” postures may well offer strategic advantage – as well as allowing us to capitalize on any game-changing technological developments that present strategic pivot points in our future plans.

Success in the combat environment of the future will still demand ingenuity and imagination as it has in the past—perhaps even more so. For example, we cannot allow the ever-increasing potential of enemy defensive systems to diminish our offensive capabilities. Our penetrating weapon systems must have high probability of success. However, weapon survivability cannot be restricted purely to munitions with global range; a spread of launch platforms and options must be retained. Similarly, we must explore alternative weapon effects that damage, disable, deceive or disrupt, as well as those that destroy. Complicating the adversary’s targeting processes and developing techniques







that disrupt their systems upstream of their weapon release point is essential. Importantly, temporary effects will be particularly critical for controlling escalation in future conflicts – and the Air Force is well placed to offer such options to our national decision-makers and joint force commanders.

Our concepts for Global Reach must develop in concert with those involving direct force application. Regardless of whether we are employing combat power from range or conducting sustained operations within a particular theater, our airlift and air refueling assets must be capable of operating in the anticipated environments. Additionally, as a full-spectrum force, we embrace the fact that the success of some operations will be less dependent upon the sustained application of combat power, and more closely linked to the speed of our global response. Whether the response is a timely precision strike on a hostile target, or pallets of food, water, and blankets delivered to families suffering from a large-scale disaster, our ability to rapidly span the globe will keep us relevant as a full-spectrum force.



## **PURSUE A MULTI-DOMAIN APPROACH TO OUR FIVE CORE MISSIONS**

Born as a force operating in the atmosphere, we have evolved to the point that we now conduct some of our original five core missions in, through, and from space and cyberspace. It is time now to take the next step – the “leap” perhaps – into full domain integration. This involves a new way of thinking, one in which we look holistically at the best way to integrate operations in all three domains to provide the most effective Air Force solution to any given scenario. For example, future air superiority challenges need not be solved solely by an air-breathing platform. Our missions are the same, but the challenges of the future and the opportunities that space and cyberspace offer demand that we approach every mission in new and innovative ways. Effectively leveraging the space and cyberspace domains as we have the air domain expands the menu of options for achieving desired effects, providing more flexibility in dealing with future global challenges. The need for this integration is even more compelling in the context of our foreseeable fiscal environment. Low-cost solutions made available through multi-domain approaches could free up precious resources for investments in capacity and capability.

A multi-domain approach also requires resiliency across and within each domain. Constant vigilance and awareness of emerging threats and opportunities in air, space, and cyberspace will allow the Air Force to transition more rapidly from one domain to another when any of them is exceedingly congested or contested. For example, once our almost exclusive sanctuary, space will become increasingly crowded and challenged. While building redundancy through unmanned air-breathing capabilities, we cannot cede our ability to maintain our national advantage in this vital domain. Instead, we must seek cost-effective measures that protect investments, maintain capabilities, and enable the advantage that comes from dominating the higher ground – employing counter-space measures where necessary.

“While cyber may be our nation’s greatest vulnerability, it also presents our military with a tremendous asymmetric advantage. The military that maintains the most agile and resilient networks will be the most effective in war.”

*-CJCS Gen Martin Dempsey*

The cyberspace domain is promising for a true breakthrough in our approach to Air Force core missions. Our professional Airmen do tremendous work in supporting the national cyber mission. That expertise, applied to the challenges that an air component commander faces in a joint force scenario, could revolutionize our employment concepts and directly influence other capabilities we may field. This is certainly not a panacea, but there are elements of non-kinetic effects such as speed and reversibility that may present more attractive options to warfighting commanders than those we currently offer.

As we seek to integrate across domains, we will continue to evolve our concepts for command and control in multi-domain operations. The complexity of these operations will likely increase, but the mandate for





clarity of direction and control of combat forces must always be met. Also, we must approach space and cyberspace capabilities with the same high standards for *precision* that we have spent decades perfecting in the air domain. We must gain and maintain a higher level of understanding of the persistence of effects, collateral damage, and reversibility. Only when we can make more informed decisions with confidence will we truly realize the flexibility we seek in exploiting all domains.

## CONTINUE THE PURSUIT OF GAME-CHANGING TECHNOLOGIES

Our Air Force has always sought to maintain a technological advantage over adversaries. We are in the midst of a period in which technological advances are abundant, so as we look to the future we will focus on those that amplify many of the enduring attributes of airpower – *speed, range, flexibility, and precision*. To be agile enough to maintain our advantage, the Air Force must reach for these game-changing technologies and evaluate their utility early in development. Some of the more promising include:

### HYPERSONICS

This technological pursuit is certainly not new, and though it still has not reached its long awaited goal of practical application, the advantage such a capability can yield warrants our continued investment and focus. Throughout aviation history, our advancements in operational speed have been steady, measuring progress in hundreds of miles per hour. This has produced a constant evolution in our operational concepts and tactics. The leap to effective hypersonic operational speed will have a profound impact that can revolutionize the way we approach our core missions in the future – from investments, to force posture, to tactics, techniques, and procedures. It is an often heard phrase in combat – “speed is life” – and though we may not always desire to operate at the fastest possible speed, the ability to do so creates a significant advantage.



### NANOTECHNOLOGY

The explosion of nanotechnology will open up new opportunities with respect to both material structures and size. By manipulating materials at the molecular level, we can create structures that are both stronger and lighter, contributing to both speed and range. Such a breakthrough will have significant implications for air-breathing and space platforms. The vexing problem of cost per pound when launching payloads into space becomes more manageable with lighter, stronger materials. Miniaturization aids in weight reduction, but also provides promise in the area of detectability. Innovative application of miniaturized systems can open the door to new concepts for sustained operations in highly contested environments.

### DIRECTED ENERGY

Exploiting directed energy technology will provide the opportunity to fundamentally alter operational concepts and support requirements. As we seek flexibility in our weapons effects and the ability to operate in contested environments, directed energy weapons with deep magazines can alleviate the need for acquiring and transporting large stockpiles of munitions into the theater, while providing precise, responsive, and persistent effects. In addition, classes of directed energy weapons can deliver temporary and reversible effects that offer more options to commanders in the field.





## UNMANNED SYSTEMS

Where unmanned aircraft once offered little more than a preferential risk profile, their utility is now growing exponentially, and must be embraced. The absence of an onboard human may not only reduce size, cost, and complexity – it can increase range, endurance, and performance. The imperative to protect the occupant can be replaced with an unemotional assessment of value versus effect, enabling us to take greater risks in highly contested environments. Future unmanned systems will be more autonomous and will place less demand on critical and vulnerable communications infrastructure. In high-intensity conflict, they will provide additional capacity or a level of redundancy for heavily-tasked space assets. In an offensive scenario, they will swarm, suppress, deceive or destroy. Their weapon effects might range from kinetic to non-kinetic; permanent to reversible; single-use to self-recharging. Better affordability will reduce the barriers to entry for smaller nations, increasing the potential for future coalitions, and wider security relationships. Affordability will also deliver quantity and mass.

## AUTONOMOUS SYSTEMS

The accelerated development of artificial intelligence and like technologies will revolutionize the concept of autonomy. Whereas we view autonomous systems as those able to execute a set of pre-programmed functions, future systems will be better able to react to their environment and perform more situational-dependent tasks as well as synchronized and integrated functions with other autonomous systems. This will provide tremendous flexibility in highly-contested environments. We must not allow technology to outpace legal, moral, and doctrinal considerations – these must all be pursued in parallel to maintain tempo and sustain the advantage.

This list is by no means exhaustive. In fact, it's just the beginning! The future will generate new combinations of technologies we cannot describe, or possibly even imagine, which will shape the way our service provides airpower. Maintaining awareness of advancing technology and harvesting the opportunities it creates is in our blood as innovative Airmen. The aircraft as an instrument of war was once considered “game changing” – pursuit of the next “game changing” technology is central to maintaining the asymmetric advantage our Air Force has always provided the nation.





# A CALL TO THE FUTURE... AND A CALL TO ACTION



One of the most important responsibilities of a military service is to prepare the force for the challenges of tomorrow, not just the realities of today. This requires a journey into the unknown, and Airmen have traditionally been very good at such endeavors. When Ira Eaker broke ground on New Year's morning 1929 to conduct the first aerial refueling, the mission's success was far from assured. Chuck Yeager had no certainty as to what was on the other side of Mach 1 when he and the X-1 were released from a B-29 on an October morning in 1947. Their drive to go farther and faster – to push into the future and see what was on the other side is at the core of what has made our Air Force truly great. General Bennie Schriever displayed the vision and perseverance

to deliver an enduring leg of our nuclear triad – the ICBM – as well as the foundation for our military space program. All this was accomplished during a period awash with uncertainty—technological, bureaucratic, and geopolitical. The attributes displayed by our Airmen forefathers have never been more important than today, given the geostrategic uncertainty we anticipate over the next 30 years. The future, with its myriad of challenges, is fast approaching, which means the consequence of inattention will be swift and severe. The intent of the strategic vectors in this document is to guide our human capital management, S&T, acquisition, and requirements disciplines toward the capabilities we believe will be most beneficial over the next three decades and beyond. However, we must be resolute and disciplined in our assessment of global trends, and prepared to reevaluate our assumptions and adjust our vectors accordingly.



This “long look” will necessarily become a more prominent part of our strategic planning. Our *Strategic Master Plan*, which will enumerate priorities, objectives, and goals associated with this strategy, must undergo the same rigorous assessment, as it will provide the resource-informed plan to guide our investments over the next 20 years. A constant eye toward rapidly emerging new threats and opportunities, combined with the agility to respond quickly, will enable us to identify strategic “pivot points” and adapt our concepts and capabilities – whether fielded or in development – to exploit them. The body of work in our current *Air Force 2023* effort provides us a sturdy foundation from which to launch this strategic effort. It is necessarily very attentive to the fiscal realities of today. By providing a thoughtful, balanced approach to absorbing the fiscal shock to the system and ensuring the viability of our contributions over the next 10 years, *Air Force 2023* allows us to more confidently cast our gaze further into the future.



Though the 30-year journey is a long one, in our pursuit of agility and inclusiveness we are not bound by the constraints of uncertainty. The need is clear and compelling. We must be fearless in our efforts to build agility into our processes, capabilities, concepts, and thinking – it will become our asymmetric advantage only if we are bold enough to take the steps necessary to achieve it. We can't say with certainty when we expect to arrive at the point at which we are sufficiently agile and inclusive, but we can – and will – start taking those steps today. Disruptive change is always difficult, and even more so in an enterprise as large as the United States Air Force. However, Airmen never shrink from a challenge – especially one as consequential as this. General “Hap” Arnold proclaimed that an Air Force “is always on the

verge of obsolescence” and must boldly seek to meet the challenges of the future. We will be bold, and commit to the change we know must occur. True to our heritage, we will shape our destiny and continue to deliver national security through the strength of our Airmen and the responsive and effective application of *Global Vigilance—Global Reach—Global Power* for America.





