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Lead Turning the Future:

The 2008 Strategy for United States Air Force Intelligence, Surveillance and Reconnaissance

Headquarters, United States Air Force Washington DC
4 July 2008

Fellow Airmen,

Since the inception of the Air Force, our Nation has asked us to create aerospace forces that no adversary could "out gun" under any circumstances. For over six decades we have answered that call. Now the Nation demands that we also create a set of capabilities that no adversary can "out smart" in the future. This strategy outlines our response in the realm of Intelligence, Surveillance and Reconnaissance (ISR).

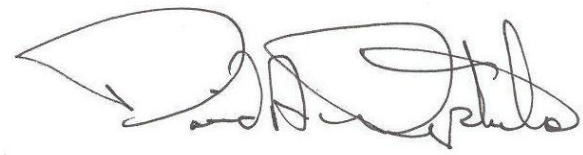
This is a new document that specifies why and how our Air Force will provide the capacity and capability for full spectrum ISR. It provides the foundation for enabling our air components to joint forces to "out smart" any adversary. This is our overarching plan for integrating people, equipment, processes, and investments to achieve Global Vigilance, Global Reach, and Global Power through cross domain integration of air, space and cyberspace ISR systems.

This strategy sets the conditions to achieve persistent surveillance and improves the integration of information to facilitate decision superiority. It advances Air Force ISR simultaneously as an enabler of tactical forces, as the provider of theater-wide operational level perspectives for joint commanders, and as a strategic lever for national decision makers. It combines our historical advantage of an elevated perspective with the means to achieve insight and foresight to yield a decisive advantage in National Security operations.

This strategy charts how USAF ISR can produce desired security effects today and in the future. Pulling the trigger is but one way to defeat our adversaries—USAF ISR, while enabling trigger pullers—also provides a multitude of additional ways to achieve National Security objectives.

The details of this strategy and their implications may be debated, but one thing is clear: we must move away from the notion of discrete ISR operations in separate domains and focus on integration of ISR capabilities to achieve Global Vigilance, Reach, and Power.

Our Nation demands that we combine our perspective and energy with the leading edge technologies of the information age to produce decisive effects wherever and whenever required. This strategy for Air Force intelligence, surveillance, and reconnaissance aims to answer our Nation's call.



David A. Deptula, Lieutenant General
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SECTION I: ENVISIONING THE FUTURE

Our strategy for the future intelligence, surveillance and reconnaissance (ISR) enterprise of the United States Air Force has a single, ambitious goal. We intend to achieve Global Vigilance, Global Reach, and Global Power through cross-domain integration of ISR—from, in, and through air, space and cyberspace. Achieving this goal is critical to the future success of American joint military operations and the achievement of long-range national objectives, but it is by no means assured or solely an Air Force mission. These national objectives not only include all phases of military operations, but diplomatic, information, and economic objectives as well. This goal requires large, long-term and integrated investments in equipment and people. Once achieved, however, the fusion of cross-domain knowledge and cross-domain exploitation offers our Nation the means to dominate the conflicts of our time.

For the last quarter-century, our global security environment has been defined by turmoil. The collapse of the Union of Soviet Socialist Republics (USSR), the breakup of Yugoslavia, Desert Storm, Operations Northern Watch and Southern Watch, 9/11, Afghanistan, and the terrorist actions in Iraq are but some examples.

This instability will almost certainly persist. We live in exponential times. As much as the world has changed, economically, socially and politically in the past two decades, it will change that much – possibly more – in the next two decades. Accelerating technologies continue to redefine how our world generates wealth and power. They create entirely new opportunities and social systems while disrupting existing institutions, rules, authorities and assumptions. Because old and emerging powers across our globalized world adapt at different speeds, they repeatedly run into and past each other. The inevitable result is friction on a global scale.

It is important to note that the underlying force behind this constant friction, and the reason we believe it will persist, is a continuing phenomena of historic scope – the disruptive technologies of the information age. They drive us to expect cycle after cycle of revolutionary change throughout our planning period.

Global spending on information and communications is now $3½ trillion a year, and climbing. It is on course to reach $4 trillion a year by 2010. Spending at this level generates tighter and tighter cycles of discovery and innovation.

For example, despite repeated predictions of its demise, Moore's Law endures. As it has for 40 years, computer processing continues to double every 18-24 months. Bandwidth is also doubling at the same logarithmic pace. If these rates continue as expected for another 15-20 years (our planning horizon), processing capacity and bandwidth will each be 1000 times greater than today. Systems we use now will seem quaint by comparison.

What knowledge will these machines and networks create? Clear-cut projections are impossible; forecasts consistently underestimate the pace and scope of the information age. However, we are certain that as discovery and innovation feed each other, they will spawn the next generation of machines and networks, creating the next generation of knowledge, which will produce even more advanced machines and networks, producing more knowledge, and so on.

Conflicts of the future will exploit these continuing cycles. The most dangerous adversaries will combine the latest information technologies with innovative tactics to produce unique capabilities. Whether nation states or insurgents, they will organize into small, networked cells of committed people. They will also incorporate legacy weapons and concepts, which still pose powerful challenges. This combination of emerging technologies, multiple types of enemies, new and legacy weapons, and innovative operational concepts – will merge to create a unique era in warfare.

Yet since the end of the Cold War, there has been one constant—the need for persistent ISR to find and understand the enemy. We cannot continue to conduct "business as usual" in the realm of ISR. We must change methods and connectivity to achieve persistence. While no single technology or enemy defines this age, it is the fusion of technology and ideas that forms the emerging character of modern war. Taken as a whole, they produce new means, methods and reasons for conflict.

Our challenge is to lead turn each cycle in this era of war. USAF ISR cannot wait until new technologies are in place before transforming our organizations, skills, and equipment. Hesitation is too risky a strategy. In today's competitive environment, where start-up companies accelerate into hundred billion dollar corporations in less than a decade, strategic threats to national security emerge just as quickly. To get out ahead of future opportunities and threats, USAF ISR must posture itself to exploit each generation of knowledge-driven capabilities as soon as they arrive. In the midst of continuous change, we need people, organizations and equipment that anticipate new technologies – that constantly build new skills and new concepts of operations – to realize the potential of new knowledge-driven capabilities. In essence, USAF ISR must prepare itself for where technologies will be, not just for where they presently are.

> *Persistent airborne ISR is a critical supporting element to USSOCOM's prosecution of the GWOT. ISR must not only be ever present, but must rapidly disseminate operational information to key elements on the battlefield.*
>
> -- General Doug Brown, USA, 2007[1]

The first *hard break* in our lead turn pursues "persistent surveillance." Next generation sensors and networks will let us monitor targets, on demand, near-continuously, to produce tailored effects. This potential capability is the product of trillions of dollars of investment and orders of magnitude advances in processing, storage and bandwidth. Persistent surveillance will, as stated in the 2006 QDR, "…establish an 'unblinking eye' over the battle-space…", including "…operations against any target, day or night, in any weather, and in denied or contested areas."

But "persistent surveillance" is only an interim objective. We want to *maneuver* toward "persistent ISR." USAF ISR must build – in parallel with our joint partners – next generation systems for sensing, processing, analysis, decision, dissemination and attack. We must *climb now* to turn tomorrow's persistent surveillance into actionable intelligence – in modes our air, space and cyberspace forces—plus the rest of the joint team and national leadership—can exploit.

> *In the post-9/11 era, intelligence is more crucial to the security of the republic than ever before. Now, that's, I recognize, a pretty sweeping assertion, so let me try to spell out what I mean with an historical analogy. I mentioned mutually assured destruction in the Cold War. If that war ever came, the Soviet Union's most deadly forces -- ICBMs, tank armies -- they were actually relatively easy to find, but they were very hard to kill. Intelligence was important, don't get me wrong, but intelligence was overshadowed by the need for raw, shear fire power. Today the situation is reversed. We're now in an age in which our primary adversary is easy to kill; he's just very hard to find. So you can understand why so much emphasis in the last five years has been placed on intelligence.*
>
> -- General Michael V. Hayden, USAF, 2007[2]

Persistent ISR is, admittedly, a challenging goal. It requires new tools and methods for data analysis, multi-level security and access to denied areas. It demands a net-centric architecture that connects sensors, processing, data storage, analysts and war-fighting platforms into a whole greater than the sum of its parts. We believe emerging technologies place these demands within reach. More to the point for military profes-

[1] Testimony of Commander, US Special Operations Command to House Armed Services Committee, 31 Jan 2007
[2] Discussion with the Council on Foreign Relations, 7 September 2007 (Federal News Service).

sionals, because persistent ISR is achievable, our competitive security environment demands we attain it.

As Airmen, we are well positioned to achieve and exploit persistent ISR. Our Air Force combines speed, range, flexibility, precision and lethality in all dimensions of warfare – land, sea, air, space and cyberspace – across the spectrum of time and operations. By combining persistent ISR with our competencies we can produce effects ideally suited for the emerging security environment. The result of our global vigilance can produce the global power needed to deter conflicts and win wars.

This *merge* requires considerable expertise. It requires ISR professionals who simultaneously understand the operational concepts, capabilities and vulnerabilities of USAF, joint, allied forces, and enemy forces. Our Airmen must combine the knowledge they create with the operational capabilities of the other elements of national power. We must be equally adept at working with surface units, bombers, fighters, cyberwarriors, national decision makers, joint forces, elements of the intelligence community, and our other partners.[3] All depend on us. They need our perspective and fusion. Exceeding their expectations is our goal.

We intend to produce thorough knowledge of every enemy that they will know – or immediately realize – that any conflict will be fought on *our* terms, to *their* detriment. Our enemies must understand that our comprehensive knowledge of them, combined with our kinetic and non-kinetic weapons, can turn their military, nation, or cell into a hollow force, with unreliable security, insufficient logistics, uncertain command, corrupt knowledge, and exposed maneuver. Our ISR professionals will exploit air, space, and cyberspace to learn how enemies operate (e.g., their networks, tactics, training and logistics), identify options to deter them and, if necessary, negate their means for making war.

Dominating capabilities, however, will not evolve from the skills, institutions and platforms of the past. They demand a uniquely trained, equipped, integrated, and empowered enterprise. They require networked organizational structures and leading edge capabilities that synchronize new and legacy systems across joint and national teams. Guiding the future development of the personnel, doctrine, operational art, organization and equipment necessary for this new strategic environment is the purpose of this ISR Strategy.

As we look forward, the strategic environment is going to be characterized by challenges. We have to understand that the world we will likely live in tomorrow will be equally complex, if not more challenging, than the world we live in today. With that as a baseline, looking out into the future, I believe we have an opportunity to redefine American air power to deal with those challenges across those three domains.

-- General T. Michael Moseley, USAF[4]

[3] For example, without the exquisite knowledge provided by cross-agency sensors and analytical skills, the US would not have been able to determine the need for and then carry out a mission to shoot down a crippled experimental satellite in February 2008, thus averting a potential hazard to populated areas while also demonstrating our ISR capabilities to the world.

[4] Address to the Air Force Association symposium, 21 February 2008.

SECTION II: BUILDING THE FUTURE

TRAIN FOR THE FUTURE

The United States Air Force is not, and has never been, a force that prefers defensive operations. From the start of any fight, our doctrine is to attack. We are convinced that "air and space power is best used as an offensive weapon."[5] This spirit has guided us to victory after victory since our birth: Mitchell over St Mihiel, Doolittle over Tokyo, Eaker over Germany, LeMay in the Cold War, Horner in Desert Storm. Prevailing over the enemy through offensive operations is core for understanding the United States Air Force of today, and envisioning the United States Air Force of the future.

How we take the offensive is not a constant; it changes over time. In different eras, as technologies and situations dictate, Airmen adjust the means and methods of offensive operations. Bombers led the force during World War II and the Cold War, fighters during the Vietnam and Korean Wars, and transports during the Berlin Airlift. Each stepped up to lead offensive operations at different times. Different generations of Airmen regularly swapped lead to match the character and technologies of the time.

Our generation of Airmen faces another lead change. In a world where we can hit anything-anywhere-anytime, finding the enemy has moved to the forefront of USAF operations. We now live in the information age. It is redefining the domain, size and location of offensive operations. We now fight in air, space and – an entirely new medium – cyberspace. Our enemies are not only the massed forces of the past, but also the demassified and hyper-empowered groups of the present. Modern technologies give even small military units and terrorist groups an array of kinetic and non-kinetic weapons capable of striking our Nation with strategic effect.

Even as their weapons grow more powerful, the signatures of these threats are shrinking. Enemies can hide deep within huge cities that multiply in density and number every day. They can also disperse among complex terrain while still remaining in constant contact.

These strategic conditions combine to require a basic shift in USAF operations. Our military imperative is no longer just to *hit* the enemy; today, we and the rest of the joint team, can kill whatever target we find. Our greatest challenge today is to *identify and understand* the enemy we need to affect, preferably before it has a chance to strike.

To maintain the initiative, we cannot wait until enemies announce themselves. Before they strike, we must know: who are they; where are they; and, what they want. With this knowledge we can strip emerging enemies of their anonymity. Our Air Force components of the appropriate joint organizations can then attack or deter while enemies are still in their planning stages – before they can attack the United States with strategic effect.

> *More recently, however, the nature of the threats and the way we choose to deter and fight those conflicts have changed. The United States is faced with adversaries who may seek to offset our technological superiority through asymmetric means, threatening the use of chemical, biological, or radiological weapons; information attacks; terrorism; urban warfare; or, anti-access strategies, either overseas or at home. Therefore, we must seize the initiative from the aggressor as soon as possible. Military capabilities that are vulnerable to preset time lines risk attack of those time lines. Delay in decisively and quickly halting an enemy may force a difficult and costly campaign to recover lost territory. Additionally, the asymmetric threats of lost coalition support, diminished credibility, and emerging incentives for other adversaries to begin conflict elsewhere are real. Thus, a new way of looking at conflict is emerging.* -- Air Force Basic Doctrine[6]

[5] AFDD 1, *Basic Doctrine*, p. 21.
[6] Ibid., p. 19.

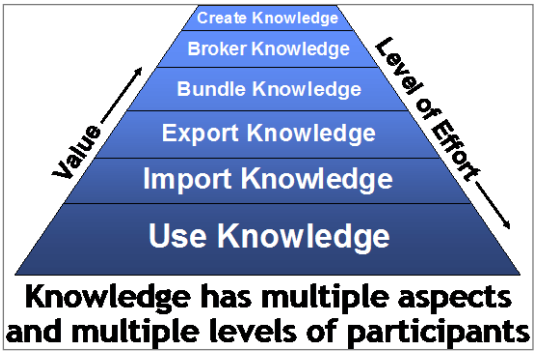
No military has ever fielded the knowledge capabilities we intend to deploy. This vision will require unique approaches to achieve.

It is telling that joint doctrine defines "data" and "information," but not knowledge. Data and information, however, are objects to discover and manipulate. They are important to offensive operations, but not sufficient. To get ahead of our enemies, we must know their goals, understand their strategies, anticipate their maneuvers, and then force our enemies to change their behavior consistent with our national security objectives. This level of knowledge is central to the art of modern war.

> *Once a commander gets a taste of what we can do with the kinds of support that intelligence, surveillance and reconnaissance provide, they can't get enough of it.*
>
> -- Admiral Michael Mullen, USN, 2008[7]

Knowledge of this quality is not available through simple observations or single reports. It is only created by well-developed professionals, exploiting multi-phenomena networks, over extended periods of time.

Our doctrine, training, and development paradigm must recognize the imperative to create knowledge. The information age has moved ISR to the forefront of USAF component offensive operations. Knowledge is now the "fuel," the fundamental prerequisite for success. We must instill in our Airmen that knowledge has priority among all USAF missions in the 21st Century.



Building knowledge requires a team. Airmen will combine different levels of knowledge. Some will focus on immediately using knowledge we produce. Other Airmen will import knowledge into the intelligence network. Still others will export knowledge for the rest of the joint team to exploit, bundle knowledge through fusion, or broker knowledge by delivering tailored assessments to specific consumers. Each aspect of building knowledge is critical to overall success. Each member of the team is necessary to achieve air, space and cyberspace effects in the information age.

It is the human element that creates knowledge. Machines help in extraordinary ways, but they only do what humans tell them to do. Regardless of the sophistication of our platforms, sensors, computers and bandwidth, in the final analysis we depend on teams of humans to produce actionable intelligence.

As we develop the USAF ISR enterprise of the future, our number one focus is on developing our 19,000 USAF ISR Airmen and civilians for a new era. In addition to all the basic principles we value in developing Airmen, we will add five principles to specifically guide the development of USAF ISR professionals:

- **Understand the enemy as a system.** Modern enemies are more than divisions of armies, flights of aircraft, or cells of terrorists. They are complex "organisms," dependent on leadership, people, resources, infrastructure, and defenses. Lose one of these key essentials and an enemy is crippled. Lose all of them and the enemy is eliminated. USAF ISR has the opportunity to affect these losses by combining information age tools with the perspective granted by air, space and cyberspace. This combination has the potential to allow our ISR professionals to understand our enemies to a degree not otherwise achievable; where they are, what they are, what they want to be, and what they fear.

[7] Speech by the Chairman, Joint Chiefs of Staff, at Nellis AFB NV, 18 June 2008, as reported by American Forces Press Service.

Once we understand our enemies' key essentials as best we can—understanding that complete knowledge is not achievable given current technological means—we can select the most effective means of attack and accurately assess the success or failure of our actions. Taken as a whole, this approach is ideally suited to the spectrum of 21st Century conflict.

> *For defense intelligence professionals, this means our missions will be diverse and multidimensional, punctuated by persistent regional engagements requiring a range of military, humanitarian, and diplomatic capabilities and assets to be used simultaneously. Cultural awareness, social modeling, and language proficiency will be as important as new intelligence systems and technologies. We will need to develop a sizeable cadre of immediately deployable experts with disparate skills. And as the Director of National Intelligence, Michael McConnell, has stated, diversity must be treated as a strategic mission imperative if we are to operate well in this environment.*
>
> -- James Clapper, Undersecretary of Defense for Intelligence, 2008[8]

- **Understand the environment.** Ours is an effects-based enterprise. The effects we impose can cascade far beyond a specific target. We must strive to understand and anticipate these effects in advance. To project possible effects on foreign cultures we must first understand those cultures. Admittedly, this imperative is easier to assert than to achieve. However, we have little choice; failure to do so can result in tactical successes but strategic failures. In today's information age, the gap between strategic impact and tactical events can be small. We must be masters at manipulating this space. With appropriate understandings of foreign cultures we can assess – in advance – the impacts of various tactical options on our strategic intent.
- **Learn continually.** The future brings with it ever tighter cycles of technological, social, political and economic change. To produce actionable intelligence our personnel development system needs equally tight cycles of education and training. Our people must learn to exploit each set of new technologies as they arrive; and test and experiment with current sensors to develop new and advanced ISR capabilities. This is one of the main charters of our ISR Center of Excellence. Our Airmen must understand new enemies as they emerge and old enemies as they evolve. These cycles of learning must be continuous throughout the careers of our ISR professionals. As Alvin Toffler wrote a quarter century ago, "The illiterate of the 21st Century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn."
- **Share knowledge.** It takes a network to kill a network. We will build the world's finest network of knowledge distribution. Airmen will not just encourage the cross-organizational sharing of information, we will incentivize it. We will demand USAF ISR professionals communicate across hierarchies whenever they see potential value. Our people must demonstrate good judgment when sharing information (e.g., multi-level security), and we will hold them accountable for their judgment, but our risk-reward balance will favor sharing *too much* information as opposed to sharing *too little*.

> *Machines don't fight wars. Terrain doesn't fight wars. Humans fight wars. You must get into the mind of humans. That's where the battles are won.*
>
> -- Colonel John Boyd, USAF[9]

- **Foster Multidimensional Leaders.** We will reserve our leadership positions for those who demonstrate the ability to lead teams to create knowledge. Our mission is too big for any single person to master it all. We must simultaneously operate in air, space and cyberspace; defeat enemies across the spectrum of operations (from small terrorist groups to nuclear-equipped nations); use multiple methods of ISR (the "INTs"); partner with the entire Intelligence Community plus allies; manage data through collection, processing, analysis and dissemination; and, meet the demands of customers who range

[8] Defense Intelligence Strategy.
[9] Quoted by Henry Eason, "New Theory Shoots Down Old War Ideas," *Atlanta Constitution*, March 22, 1981.

from the cockpit to the White House. Mastery is only possible through the actions of high performing teams. Only teams can produce actionable knowledge by fusing multiple media, tools, perspectives, and customers – and teams require insightful leadership. Our most valuable people are those who successfully lead cross-domain, cross-discipline teams to create actionable knowledge.

Our goal is to create knowledge that will persuade, dissuade, shape, and change the behavior of our Nation's enemies.[10] Each of these five principles is critical to achieving this goal. They are fundamental to the ways Airmen can seize the initiative through air, space and cyberspace in the 21st Century.

[10] Immediately following the May 2008 natural disasters in Burma and China, USPACOM offered humanitarian assistance to include providing geospatial information to help with relief operations.

ORGANIZE FOR THE FUTURE

As missions and technologies change, so will the structure of the intelligence, surveillance and reconnaissance enterprise of the United States Air Force. Therefore, we need organizational structures that continuously adapt to the information age capabilities and objectives of our nation, and those of our enemies.

Today's leading institutions organize for continual adaptation. Especially in the information and communications sector, top corporations organize in ways that allow continuous synchronization of change across the entire operation. From central campuses, inventive and responsive firms continually form and reform teams to seize opportunities and meet new competitors, and then rapidly synchronize new approaches and products across global components. With products that rarely remain leading-edge beyond five or ten years, the best information age firms organize to actively promote change – not just react to it.

Air Force operations also capitalize on centralized approaches where they provide joint force advantages. We run an air war spanning all of Southwest Asia from a single Combined Air Operations Center (CAOC) in Qatar. We control all global mobility missions from the 618th Tanker Airlift Control Center in Illinois. We control worldwide sorties of Predators and Reapers from Creech AFB, Nevada, and Global Hawks from Beale AFB in California, and then exploit their data at multiple locations around the globe. Centralized control allows Airmen to synchronize complex operations across the globe, and adjust tasking as operational situations dictate—projecting power without projecting vulnerability. Correspondingly, the Air Force tenet of decentralized execution allows Airmen to innovate and execute with initiative that only comes from empowering personnel to apply guidance at the lowest possible level.

We are bringing this same concept to ISR resource management. As directed by the Chief of Staff, United States Air Force, AF/A2 has the "authority and responsibility to organize, plan and manage the Air Force National (strategic) and Service (operational) intelligence, surveillance and reconnaissance capabilities."[11] The intent is to specify a single focal-point to minimize seams between ISR processes and strengthen advocacy for ISR inside the USAF.

To achieve integration and advocate effectively, AF/A2 will develop positions for all joint, service and interagency resource management decisions affecting USAF ISR.[12] It will exercise end-to-end leadership of USAF ISR regarding doctrine, personnel, guidance documents, long-range plans, program objective memoranda and supporting analyses & estimates. The A2 at each of our major commands should have parallel responsibilities for ISR capabilities within their commands.

This single USAF ISR "voice" will synchronize USAF perspectives to create an Air Force ISR "enterprise" to ensure AF ISR meets national objectives. Integration at this level will ensure our air, space and cyberspace ISR capabilities align *internally* with the rest of the USAF, and *externally* with the rest of the intelligence community and the joint team.

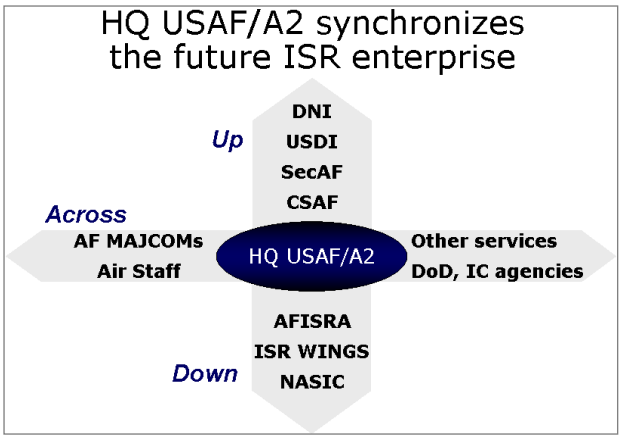
AF/A2 will build the perspective, data, and vision to make informed modernization decisions, and then guide USAF recommendations through multiple, complex and overlapping bureaucracies. This single ISR focal point can rationalize programming and policy decisions from *above* (e.g., the Undersecretary of Defense for Intelligence and the Director of National Intelligence), *across* (e.g., USAF programming, acquisition and personnel), and *below* (e.g.,

[11] HQ USAF PAD 07-09, 7 May 07, *Air Force Intelligence Transformation.*
[12] Current examples of such bodies include the Deputy Advisory Working Group and the Joint Chiefs of Staff Requirements Oversight Council.

all elements of USAF ISR). It can provide consistent and comprehensive guidance for the thousands of daily decisions that strategically affect our ISR enterprise.

Our partners (who have increasing weight in our investment decisions) deserve a single focal point to help prioritize and integrate future USAF ISR capabilities. With our dynamic technological environment, it is simply too difficult for multiple *external* partners to synchronize priorities with multiple *internal* decision makers. They deserve a single entry point on USAF ISR resource decisions—a focal point that AF/A2 provides.

As a first principle, AF/A2 will use this organizational construct to evolve ISR as an integrated whole. We will not build stovepiped ISR systems. We will not arbitrarily reserve certain ISR missions solely for space platforms and others solely for atmospheric systems. Each element of USAF ISR collection, processing, analysis and dissemination (CPAD) depends on the other elements so we will develop the entire process as a single entity. We will synchronize advances in each area (such as collection) as we advance all the other CPAD elements across our responsibilities (intelligence, surveillance and reconnaissance) and our domains (air, space and cyberspace). We will pay special attention to integrating non-traditional ISR[13] (such as ELINT sensors on F-22) into the total architecture. Sensors on non-traditional ISR platforms can provide our ISR enterprise huge returns not attainable elsewhere. We will also work with other services, joint and departmental agencies to achieve national objectives. In tandem with our partners in the joint team and the intelligence community, we will develop an integrated set of ISR capabilities, with its associated command and control, to ensure comprehensive coverage within fiscal guidance and prudent management of risk.



For similar reasons, AF/A2 will also act as the service focal point for specific joint and national capabilities. At the present time, specific Service Cryptologic Element (SCE) authority resides with the AF ISR Agency commander, but is coordinated through the AF/A2. Should other aspects of ISR (such as HUMINT, GEOINT and MASINT) require supporting service elements, AF/A2 will also assume a similar role. As the senior intelligence officer of the Air Force for these specific capabilities, AF/A2 can exercise its unique position to promote interdependence, foster interoperability and minimize "stovepipes." AF/A2 will integrate resource decisions in each service ISR element with all the other ISR elements in the enterprise.

In terms of systems, we subscribe to the concept of interdependence. We have neither the need nor the funds to field every possible ISR capability suitable for USAF component operations. We are part of a national ISR infrastructure; we will leverage the core competencies of other intelligence agencies and the rest of the joint team to perform not only air, space and cyberspace missions, but to also include the performance of current and future national missions.

> *(O)ur ultimate focus must recognize that jointness isn't a pejorative term, nor is it a notion that diminishes our Air Force… (T)he Joint Force is more sophisticated, interdependent, and capable than any single service, agency, or discipline.*
>
> -- General Norton Schwartz, USAF, 2007[14]

[13] Exploitation of data collected by sensors on non-ISR platforms; also called non-traditional ISR.
[14] *Letters*, Air Force Magazine, May 2007

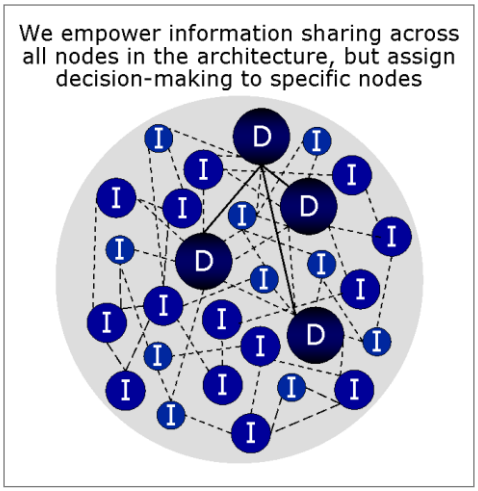
Finally, the AF/A2's charter to "manage and present integrated AF ISR capabilities"[15] is an evolutionary step. Striking the right USAF ISR investment balance among multiple missions, users and technologies, plus integrating these decisions with personnel and CONOPS development, and then presenting capabilities to combatant commanders through their air components, are immense tasks. Our increasing ability to rapidly gather, analyze, and disseminate all-source intelligence will make ISR means, products, and personnel more valuable to warfighters and strategists, from senior leaders at the National level to the Airman on the line. As such, there may be tremendous synergy in bringing together all ISR capabilities in an end-to-end ISR Numbered Air Force (NAF) or ISR Major Command (MAJCOM). It's not just about ISR aircraft any longer—it's about the global ISR enterprise, including ties to the Combat Support Agencies; ISR from and in space and cyberspace; Distributed Common Ground System (DCGS); National Tactical Integration (NTI); HUMINT, SIGINT, MASINT, GEOINT; ISR Groups and NAF-C needs; SOF ISR requirements; Processing, Exploitation, and Dissemination (PAD); Targeting; and much more.

> *The Air Force began its Intelligence, Surveillance and Reconnaissance transformation about two years ago and is blazing a trail by creating a new ISR focus by empowering personnel, establishing globalized ISR organizations, and implementing a cross-domain portfolio of capabilities. Bold thoughts span from the possible creation of an ISR MAJCOM to a future with more unmanned than manned ISR systems.*
>
> -- James Clapper, Undersecretary of Defense for Intelligence, 2008

ISR is currently spread out among various commands in various domains—where it is not often a priority—and it will never realize its potential as long as it remains disaggregated. Organizing AF ISR as an enterprise integrating air, space, and cyberspace ISR functions into a NAF or MAJCOM is a step that can actualize the construct of cross-domain dominance.

As an evolutionary and appropriate step into the future establishing an ISR NAF, or MAJCOM will ensure appropriate presentation of all source, cross-domain ISR end to end capabilities—the ISR platforms in air, space, and cyberspace, and the associated PAD systems and architectures—in a world of ever growing ISR demand. This will be a critical step as part of a long-term approach to building a cross-domain, cross-discipline ISR enterprise; one that is capable of lead turning our constantly changing security and technological environments—not simply to report changes, but to anticipate them and then capitalize on that knowledge.

As we *centralize* leadership for the USAF ISR enterprise, we will continue to advocate for *decentralized* execution. We will implement centralized command of the overall ISR enterprise to achieve synergies in organizing, training, and equipping, while entrusting the decentralized execution of ISR operations to operational leaders to achieve timely and appropriate actions.



In our era of conflict, targets are increasingly unpredictable. They emerge suddenly, strike quickly, and then meld into surrounding terrain. The resulting demands of time compression require pushing ISR operational planning and execution down to the lowest possible levels. The necessity for tighter decision cycles than any enemy drives us to rely on decentralized execution.

At each level within our decentralized chain, our people need to know the "why" behind their tasking. With this perspective they can bring the art of war to ISR mission planning

[15] HQ USAF PAD 07-09.

and execution. Our Airmen can stay ahead of innovative and dynamic enemies by adapting the knowledge we create to the new opportunities and threats that suddenly emerge.

Our model is to *inform generally and empower specifically*. While empowering the broadest distribution of information, we will specify various levels of decision authority. Through multi-level access, our entire enterprise will work to discover new knowledge while still holding specific authorities responsible for the ultimate decisions.

The Air Force Distributed Common Ground System (AF DCGS) is the heart of a global cross-domain integrated knowledge dissemination approach. AF DCGS is the Nation's premier network of ISR professionals in air, space and cyberspace operations. It provides an open, net-enabled information architecture, fully joined with the DCGS of the other services. We spiral AF DCGS development to integrate new capabilities as they deploy. Our overall goal for the AF DCGS network is to integrate global sensor data of all types, turn them into decision-quality intelligence in near-real-time, and send this intelligence directly to those in need at the Joint Task Force level and below.

This architecture can bring the global capabilities of USAF ISR to bear on any challenge. For example, with the recent change in organizing the DCGS structure as a global organization, the commander of any Air Force Major Command (MAJCOM) can access the entire AF DCGS system in a crisis. MAJCOMs are now not limited to only using those DCGS elements assigned to them, but can exploit the AF DCGS architecture around the world—around the clock as circumstances require. If need be, we can focus our entire global network of expertise (including the all-source analysis strengths at the National Air and Space Intelligence Center) on a particular MAJCOM air component mission.

This virtual global network has a series of operational advantages. It decreases our deployment footprint by accessing analysis and command and control functions far from the fight.[16] The virtual global network also cuts deployment and sustainment requirements, lessens our exposure to casualties (an American strategic center of gravity), makes more personnel available from the first day of any crisis, allows us to task global networks of experts throughout an operation, and gives our people well-exercised and secure links with the rest of the intelligence community. These operational advantages allow us to bring overwhelming focus to any problem across the globe on a moment's notice. It is key to our long term goal of achieving persistent ISR.

This approach parallels trends in collection platforms. More of our collection capabilities are being hosted on unmanned aircraft (e.g., UAS, aerostats). Processed data from these platforms must move on global networks to multiple analysis sites for exploitation and further dissemination. So when we task one element of this architecture (such as a UAS), we must concurrently assign responsibility for the subsequent analysis within our global network of Distributed Ground Stations. We must also identify the distribution links (such as specific satellite transponders). Each of these assignments is necessary to turn collected data into actionable intelligence. Our global AF DCGS architecture allows us to designate each link in the ISR chain (sensors, platforms, paths, and analysis) to the highest priority tasks at hand.

> *If we have to fight, prepare to do so from the neck up instead of from the neck down.*
> -- General Jimmy Doolittle, USAFR[17]

[16] Personnel and equipment needed to launch, recover and maintain platforms will deploy wherever needed.
[17] www.pacaf.af.mil/library/pacafheritage/jimmydoolittle/doolittle/index.asp.

At the same time, we recognize the face-to-face imperatives of our craft. We will deploy elements of AF DCGS forward to interface directly with operational decision makers. Wherever key decisions are made, we will position a cadre of leaders to personally advise and direct ISR operations. These leaders will have instant access to our global ISR enterprise.

We have neither the money nor the time to put an eardrum and eyeball on everything 24/7. Therefore, we will use centralized control of our global capabilities to optimize and rapidly present tailored USAF ISR forces whenever and wherever needed. We will then use decentralized execution to focus USAF ISR capabilities on targets that at particular points in time have the highest operational priorities across all service, joint, and national requirements. Only through an optimization approach that capitalizes on service interdependency, can the nation more effectively achieve persistent ISR capabilities and increase our ability to penetrate sanctuaries created by our enemies.

AF ISR, enhanced by the recently established AF ISR Center of Excellence, AF Analysis Center of Excellence, and AF Targeting Center of Excellence will produce tactics, techniques, and procedures that will not only keep pace with the rest of the operational and intelligence communities, but will also prepare us to lead operational offensives. We will operate as either supporting or supported elements of national power, depending on the security situation.

> *I would tell you that in the 21st Century intelligence is operations. By way of example, when we took out Abu Musab al-Zarqawi in Iraq last June, that operation consisted of countless analyst hours, over 600 hours of Predator time, followed by about 10 minutes of F-16 time. The find, fix, track and target part of the equation in this case took far longer, and was much more complex than the engage part.*
>
> -- Lt General David Deptula, USAF, 2007[18]

The Air Force joint ISR vision is an implementation of the DoD's net-centric information sharing vision in which *all* ISR assets—space, cyber, air-breathing, and even those organic to small units—could be managed as a single constellation. Tasking would be posted to the network and be persistently available and accessed by sensing platforms according to procedures that are adjusted as circumstances require. Sensed products would be instantly exposed to authorized users who would have the ability to select raw or processed products, or both. Applying this holistic view of the battlespace to those with the imagination and initiative to capitalize on it will provide agility and produce capabilities as yet unthought-of much more quickly and at less cost than the industrial age perspectives of the past.

As a necessary step toward accomplishing this vision, and to ensure ISR effects are synchronized with other kinetic and non kinetic operations, we will move forward to integrate collection management processes with the tasking of all other assets inside joint and combined air operation centers (AOCs). ISR tasking processes have been treated as a staff function under the direction of theater J2s vice being employed by a designated component commander as a part of operational execution. As we have advanced platforms to conduct mutli-role missions with longer sortie duration times, the distinction between ISR and any other air, space and cyber mission can no longer be separated by sortie exclusivity, but rather must address the phases of a sortie paired with specific missions. We must continually evolve all aspects of air, space and cyber power and advance our AOC command and control/tasking processes to keep pace with the flexibility, agility and employment these options bring us. As we move into a world where every sensor is a shooter, and every shooter is a sensor, we must adjust our planning, tasking, and command and control processes accordingly.

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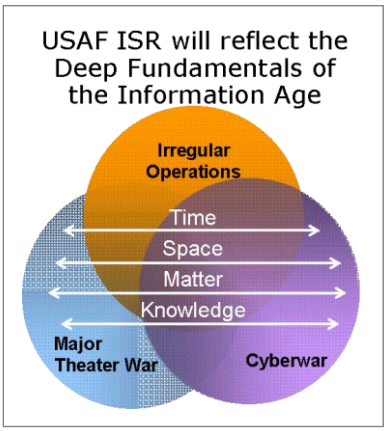
[18] *Remarks to a Defense Strategy Seminar, 27 April 2007.*

EQUIP FOR THE FUTURE



Over the next two decades, the United States Air Force will dramatically reshape our entire ISR force. We will procure new technologies, retire aging systems, modernize current platforms, and integrate future joint and national capabilities. We will make far-reaching capability and equipment decisions that reflect today's perceptions of the future security environment, to include developments in technology, threat and fiscal guidance.

Future Airmen will have to live with our decisions. The USAF ISR enterprise we build *today* will be the one our successors employ *tomorrow*. We owe future Airmen a total portfolio of ISR capabilities that will meet whatever security challenge they face.

We do not have the option of building multiple future portfolios. We cannot build one ISR force for future wars with peer competitors and a different ISR force for future wars with insurgents. We cannot build three separate sets of ISR capabilities for operations in air, space and cyberspace. All our systems must work together to give national, joint and component commanders decisive effects regardless of the type of conflict. Our decisions to retire, sustain, or modernize individual systems must produce a single and integrated portfolio of capabilities, ready to achieve future decision superiority in any conflict across air, space and cyberspace.

A guiding principle as we look to equip our AF for the future is that every sensor platform will be a shooter and every shooter platform will be a sensor. Our goal is that what today we label "non-traditional ISR" will become simply "ISR" In the future.

Measuring the value of future systems in future operations is both art and science. We have no data on the future, so we cannot assign exact values to future systems across all future operations. However, we can project the *relative values* of alternative future systems within a total portfolio of capabilities. Because all must contribute in the emerging knowledge-based environment, we can project value relative to each other by comparing how each exploits the "deep fundamentals" of the time, space, matter, and knowledge in the information age. These deep fundamentals affect all human activities, from the way humankind cooperates and innovates to the way we make war.

- ***Time***. *The temporal domain of the battlespace.* While speed in battle has increased throughout history, modern conflict has accelerated combat to the speed of light. We must develop operational concepts that exploit the potential of speed-of-light weapons (such as directed energy, electronic warfare and cyber) plus integrate them with the proven performance of less-than-speed-of-light weapons (such as missiles and traditional surface forces). Through new man-machine relationships, we must integrate our air, space and cyberspace ISR systems to produce actionable knowledge for joint commanders faster than any enemy.
- ***Space***. *The distance between objects in the operational area.* Boundaries in 21st Century warfare are increasingly arbitrary and decreasingly relevant. Commanders must consider previously unimaginable distances that extend tactical events globally (such as controlling UAS over Afghanistan remotely from Nevada). Cyberspace further blurs boundaries between regional conflicts and the homeland, while satellites totally ignore regional and other spatial lines between combatant commanders.

- ***Matter***. *The amount or volume of resources required to produce a specific effect.* Individuals and small groups can now exert strategic effects that were once reserved for large nation-states. On the battlefield, effects that once required massed formations of soldiers and fleets of bombers are now achieved by a few precision weapons. The emergence of cyberwar illustrates how the amount of matter needed to produce significant effects is now measured at the particle level.
- ***Knowledge***. *The awareness of what is operationally relevant in the conflict space.* No military organization can survive for long in the face of enemy knowledge superiority. When the information age makes unprecedented quantities of data available to practically any group, knowledge superiority depends on *qualitative* differentials: identifying the specific target and directing the right matter to the right space at the right time within the opponent's observe-orient-decide-act (OODA) loop.

By appreciating the key components of these fundamentals, we position ourselves for long-term success. Therefore, we will assess the relative values of individual technologies and systems, and alternative portfolios of technologies and systems, in terms of criteria that map to these fundamentals.

Fundamental	Component	Definition
Time	Time-to-Think	*Amount of time a decision maker has for "orienting" in the OODA loop.* As the complexity of conflict increases, decision makers need more time to absorb the immense amounts of information available. ISR systems that provide decision makers with added decision time have high value.
	Adaptability	*Speed and ease that an ISR system can adjust to new conditions and requirements*. We need ISR systems with the ability to quickly adapt to unforeseen operations. As the predictability of new threats diminish, so too does the value of "one-of-a-kind" ISR systems.
	Time-on-Station	*Amount of time an ISR system can collect (observe) on an area of interest.* Long dwell times over target increase the opportunity for persistent surveillance, allow for change detection against low-signature targets and decrease the number of platforms required.
	Responsiveness	*Time to target area*. In our unpredictable world, the faster an ISR system can deploy to a target area, the better. Satellites with continuous dwell over specific areas have great value; however, the expense of adjusting a satellite's orbit may decrease this value.
Space	Spectrum of Operations	*Utility of a mix of ISR systems to specific operations (i.e., humanitarian response, major theater war, irregular warfare, cyber war).* Because multiple types of operations regularly occur in the same space, ISR systems applicable across the full spectrum of operations have high value.
	Coverage	*Total area surveilled at any specific time.* Systems that can collect over large areas (of land, spectrum, etc.) are more valuable than systems that can only view small areas.
	Discrimination	*Accurately discern legitimate targets among many similar objects, especially mobile targets.* Systems with the capability to distinguish hostile targets from innocent civilians – for example in urban terrain, and in less than ideal conditions (e.g. night, precipitation, decoys, cloud cover, blowing sand) are increasingly valuable.
	Accuracy	*Precisely geo-locate a target or object of interest.* The ability of munitions to provide tailored effects and precise damage, plus the advantage in exposing fewer strikers to combat, heightens the value of ISR systems that provide the accurate geo-location of targets.
	Survivability	*Cover any area of interest without suffering loss of collection, processing, analysis or dissemination capabilities.* ISR systems that perform in high threat environments with low risk of disruption have higher value.
	Penetration	*Able to sense the enemy even when the enemy takes action to prevent our access.* For example, the use of stealth technology to access an op-

		posed environment without the enemy's awareness of our presence.
Fundamental	**Component**	**Definition**
Matter	Sustainment	*Degree of support required (e.g., personnel, training, maintenance and resupply) over time.* The more autonomy a system allows, the greater value it has for operational commanders.
	Replacement	*Ease of fielding additional or replacement ISR capabilities.* Systems we can quickly field (to offset attrition or meet unexpected threats) have higher value than systems (such as satellites) that require years to develop and check-out. Logistics and training tails needed to realize operational capability are added factors.
	Surge	*Deploy and support additional systems within operationally-significant timelines.* Against innovative enemies, commanders may need unexpected levels of additional force. Systems able to rapidly add force structure in time to meet commanders' needs (e.g., they have a robust industrial base) have high value.
Knowledge	Multi-Phenomenology	*Number and types of different "INTs" a system can employ.* Few targets reveal their secrets via a single phenomenology. The ability to employ multiple phenomena simultaneously can produce insights unobtainable through single sensors.
	Interoperability	*Degree of sharing across different types of sensors and information systems*. Systems optimize for rapid and wide information distribution (e.g., Distributed Common Ground System) have high value due to improved information fusion across multiple collection methods.
	Uniqueness	*Whether a system is the only means to collect against an area of interest under certain conditions*. When the phenomenology related to an object/target is so specialized that only single system is capable of providing that information.
	Correlation	*How well disparate data can be synthesized to provide understanding which creates knowledge.* The entire system, human and machine, needs the ability to combine seemingly unrelated data to create understanding. Superior training in the art of intelligence can greatly increase the ability to synthesize data and find meaning.

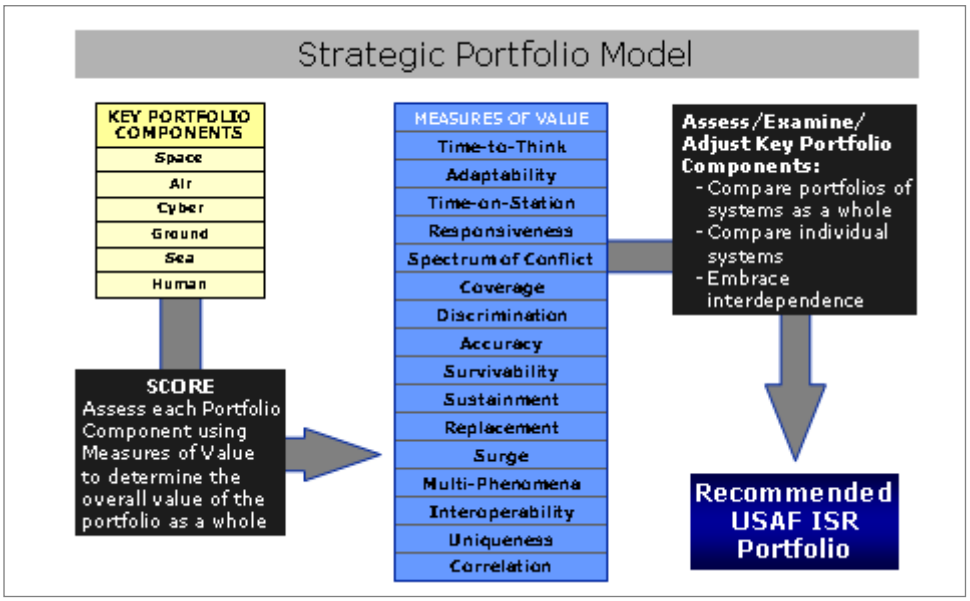
As an information-based enterprise, USAF ISR will use these seventeen components to guide investment priorities. Taken as a whole, they capture the future value of individual systems and portfolios of systems across the four fundamentals in the information age. Using a set of values that reflect our best understanding of the future, we can weigh the unique strengths and weaknesses of each ISR system (or portfolio of systems) that we decide to procure, modernize, replace or divest *directly* against its alternatives. By using these seventeen criteria as a guide to investment decision alternatives, we can capture their future value in a way that allows direct comparisons while considering risk. Risk includes the potential loss of lives, time or investment and needs to be weighed carefully against each investment decision.

These measures of future value can be applied to our investment decisions in three general ways:

- ***Compare portfolios of systems as a whole***. Against complex, lethal and innovative enemies, each of our ISR systems must work with other systems to achieve a joint force commander's desired effects. By assigning values to each system's contributions to these seventeen components, we can better assess the future value of entire portfolios relative to alternative portfolios. Also, we may be able to assess the value of changing a single system within a portfolio by how much it changes the future value of the portfolio as a whole.
- ***Compare individual systems.*** We can compare scores of similar systems to assess value relative to each other. For example, while the U-2 and Global Hawk perform simi-

lar missions, they (and their supporting elements) have distinct strengths and weaknesses vis-à-vis each other. These measures of future value are another option to evaluate those differences.

- ***Embrace interdependence.*** This future value assessment enables examination and analysis of USAF ISR systems in the context of the Nation's total ISR enterprise. We recognize that fiscal realities and partner competencies argue for an interdependent approach to USAF ISR investment decisions. This construct gives us a means to weigh the future value of alternative interdependent portfolios.



This strategic portfolio model can guide investment decisions, but it can't make them. Decision makers will still need to add assessments of affordability, and of various other forms of risk to our measures of future value.

Every investment decision also includes tough calls on future risk. Decision makers must balance budget risk (will the contractor deliver within budget?), schedule risk (will the contractor deliver on time?), political risk (will the program produce allies or antibodies in the administration and Congress?), technical risk (will the program perform as advertised?), competitor risk (will an adversary quickly field a countermeasure), bureaucratic risk (will "institutional inertia" frustrate development), and transition risk (can we tolerate a gap between a new system and its predecessor?).

Assessments over uncertain budget projections and multiple forms of risk are judgment calls that like many others are outside our control. However, we can and will give decision makers our best military advice on the future value of alternative systems and portfolios. By understanding how individual systems contribute across the fundamentals of the information age (time, space, matter and knowledge), we can compare alternative systems in terms relevant to multiple future environments. We can also assess their overall contributions within portfolios of systems, to include interdependent systems across the intelligence community. Decision makers can then insert their estimates of risk and affordability to produce the ultimate verdict.

Our strategic portfolio model, incorporating our assessments of future budgets and levels of acceptable risks, produces the following recommended USAF ISR portfolio guidance.

	Category	Inv Trend	Investment Guidance
Space	Complex, High Resolution (Tier I) Space Systems	⇔	Continue to leverage investments in national architecture, while advocating movement to a unified National space acquisition organization. Focus investments on integrating National data into AF DCGS. Continue to support with AF manpower at current levels. Leverage commercial capabilities for augmentation. Leverage investments in national and commercial systems and focus Service investments on Tier II systems.
	Medium Resolution (Tier II) Space Systems	⇑	Pursue a new paradigm for future satellite capability investment: small satellites, less expensive, larger quantities (compared to Tier I systems), and medium resolution. Seek capabilities that are more responsive to COCOM tasking and requirements and follow the Operationally Responsive Space (ORS) concept of launching replacements as needed.
	Overall Space Systems	⇑	Raise overall reliance on space systems to provide persistent surveillance over permissive and denied airspace and areas of interest. All space capabilities to include ISR, SSA, Weather, and Integrated threat Warning will provide ISR data to net-centric, Service Oriented Architectures (Joint and National) in near-real-time.
Air	High Altitude – Manned Systems	⇓	Reduce reliance on manned, high-altitude ISR aircraft systems. Leverage non-traditional ISR capabilities of stealthy high-altitude manned aircraft (e.g., F-22, F-35, next generation bomber), and adapt current planning and tasking processes (e.g., Air Tasking Order) to accommodate ISR assignments for multi-dimensional aircraft.
	Theater Capable Unmanned Systems	⇑	Continue increasing investment trend in R&D and technology development for long-endurance / ultra long-endurance, multi-mission capable ISR and non-traditional ISR capable UAS, to include stealthy UAS and untethered airships.
	Medium Altitude – Manned Systems	⇑	Continue investments in manned ISR and non-traditional ISR aircraft as a bridge to the recapitalization of the aircraft with ISR/secondary ISR UAS. Increase development of non-traditional ISR capabilities for manned fighter and all mobility aircraft.
	Local Unmanned Systems	⇑	Increase investments in long endurance / ultra long-endurance, multi-mission capable ISR and secondary ISR capable UAS, to include stealthy UAS and untethered airships.
	Small Unmanned Systems	⇔	This is primarily a surface service, small unit focused investment area. Leverage interdependencies of sister services to insure that small units receive the ISR they need to optimize their capabilities.
	Overall Air Systems	⇑	Future overall ISR air capabilities will migrate towards greater numbers and capabilities in unmanned air sys-

			tems (using reachback) than in manned systems. All ISR aircraft and non-traditional ISR aircraft systems must be capable of providing ISR data to net-centric, Service Oriented Architectures[19] (Joint and National) in near-real-time. UAS will provide greater persistence and reduce risks to crews, especially in non-permissive airspace. Use of stealthy, non-traditional ISR aircraft will increase the overall collection capability and coverage without additional ISR force structure. Integrated self-healing networks of airborne ISR systems have the potential to offer solutions to threats to space-based ISR systems.
Cyber	Equipment	⇑	Increase investment trend in offensive and defensive network capabilities. Leverage commercial R&D and capabilities.
	Software	⇑	Increase investment trend in R&D and capabilities to provide data to net-centric, Service Oriented Architectures (Joint and National) in near-real-time.
	Connectivity	⇑	Increase investment trend in R&D and capabilities to provide data to net-centric, Service Oriented Architectures (Joint and National) in near-real-time.
	Overall Cyber Systems	⇑	Increase the investment trend in R&D and capabilities that support full spectrum operations and provide multi-purpose users access to data in near-real-time. This will increase overall persistence, capability and capacity of the ISR enterprise and potentially reduce the reliance on LD/HD airborne/space systems for required data.
Ground	Unmanned Ground Systems	⇔	Maintain investment in unattended ground sensors with emphasis on CBRNE and WMD characterization/attribution, particularly for domestic events.
	Manned Ground Systems	⇑	Increase investment in ground human collectors (HUMINT) and capability to provide data to net-centric, Service Oriented Architectures (Joint and National) in near-real-time.
	Service Oriented Architecture	⇑	Increase investment in R&D and capabilities to provide data among net-centric, Service Oriented Architectures (Joint and National) in near-real-time and integrate traditional and non-traditional ISR data across the joint and national communities.
	Overall Ground Systems	⇑	Increase investment and R&D to achieve capability to provide data to net-centric, Service Oriented Architectures (Joint and National) in near-real-time. This will allow multiple user access to ISR data in near-real-time for all source analysis and knowledge dominance. This will increase overall persistence, capability, and capacity and potentially allow reductions in other collection areas.

[19] An integrated architecture of ISR sensors, processing, analysis and dissemination.

Human	Training	⇔	Refocus investment in human capital to include development of military and civilian work forces of the future. Provide analysts additional training to increase cultural and cognitive situational awareness analytic skills.
	Education	⇑	Increase investments and R&D in technologically intensive educational tools. Refocus and revitalize skills education throughout a career to enhance cognitive situational awareness expertise and improve overall analytical speed and quality.
	Analysis	⇑	Increase investments in technologically intensive tools to aid humans to affect orders of magnitude increases in efficiencies in processing (to include machine-to-machine processing), analysis development, and exploitation of increasing volumes of ISR data. Increase investments in tools for language translators, change detection alerts, key word recognition, and massive data storage/recall capabilities.
	Overall Human Capital Systems	⇑	Increase investments in career-wide education and training. By improving workforce analysis skills, quality, advanced tools, education and training, the overall workforce numbers may be optimized and potentially reduced in the long term. This will allow more effective analysis of increasing amount of ISR data and greater flexibility to respond to changes in the global environment/nature of warfare.

The overall theme of our recommended ISR portfolio guidance is twofold: evolve to a force of more unmanned capabilities than manned capabilities; and, build a Service Oriented Architecture (SOA) where cross-domain knowledge enables decision superiority across the spectrum of operations. To increase the value of human decision-making, this portfolio continues to shift human location from sensor platforms to the global architecture.

This portfolio mitigates risk through diversification. It moves away from the notion of discrete operations in individual domains and focuses on achieving desired effects to create Global Vigilance, Global Reach, and Global Power. It retains the advantages of both manned and unmanned systems, exploits multiple domains (air, space and cyberspace), leverages the capabilities of national and joint partners, and integrates nontraditional ISR systems. This portfolio is relevant to the full spectrum of present and future conflict, regardless of location, duration or intensity.

Most importantly, this recommended USAF ISR portfolio positions future Airmen to lead turn adversary capabilities. It reflects our best judgment on the technologies, threats and fiscal guidance of the future security environment. By reflecting the deep fundamentals of the information age, we believe this portfolio gives future Airmen the tools to dominate whatever security challenges they face. More analysis and discussion will be required to develop these recommendations, and more needs to be done to improve the acquisition system to adapt faster to meet the changing security environment. This is a start.

Because ISR capabilities are at the core of finding, fixing and engaging targets, ISR has never been more important during our 60 years as an independent Service. In fact, ISR has become the foundation of Global Vigilance, Reach, and Power. Yet ISR assets and Airmen are often "low density" compared to their high demand. We are wearing them out at rates that must be reversed.

-- General John Corley, USAF, 2007[20]

[20] Prepared testimony as VCSAF to the HASC/Readiness Subcommittee, 13 March 2007.

CONCLUSION

The end game for the Intelligence, Surveillance and Reconnaissance capabilities of the United States Air Force is to achieve Global Vigilance, Global Reach, and Global Power through cross domain integration of ISR in air, space and cyberspace. Our goal is to build a total system that combines persistent surveillance with a decision system that creates and exploits knowledge faster than any enemy can react. This total system is ambitious yet attainable. It is up to our generation of Airmen to lay its foundations so that future generations will have the tools to dominate 21st Century adversaries. The Department of Defense is ready to turn the corner on ISR. The strategy outlined in this document sets the course for the US Air Force's part in lead turning the changes required to accomplish this goal.