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AIR FORCE MODERNIZATION:

NEW INVESTMENT PROCESSES AND PRIORITIES FOR A 2020 AEROSPACE FORCE

by

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Abstract

There is a growing disconnect in DoD between resources and requirements and it is becoming increasingly evident in the USAF. This paper starts with an overview of the disconnect and a general discussion of the current "Revolution in Military Affairs"—is it reality or hype and how does it impact any current or future Air Force investment strategies? Against this backdrop of technological innovation, the paper presents an appraisal of the DoD's Planning, Programming, and Budgeting System (PPBS) and then more specifically, the Air Force's own planning processes—are they functioning as originally intended? The paper then moves into an assessment of the current Air Force modernization plan, suggests a new model for integrated Air Force investment planning, and proposes several options for reprioritizing the current baseline investment strategy. The central focus of this section is an analysis of a recent joint AF/XP and SAF/AQ briefing on Future Modernization Priorities and Processes. Finally, any discussion of modernization cannot avoid the inescapable debate on affordability, which is covered in the last section—continuing to serve as the world's only remaining military superpower is not cheap, but relatively affordable in our current, robust economy.

Chapter 1

Introduction

In 1991, during Operation Desert Storm, and again over Serbia in 1999 during Operation Allied Force, and in many smaller-scale contingencies in between, the U.S. Air Force continues to demonstrate that well-trained and well-equipped aerospace forces can dominate most aspects of operations on the modern battlefield. Within a few days of the commencement of combat operations, coalition and allied forces were able to gain the freedom to operate with near impunity over enemy territory while denying the enemy the ability to operate at all over friendly territory. During these conflicts, allied forces reduced enemy combat capabilities and war-making potential to such a degree that the coalition accomplished its objectives in minimal time and with very few casualties.

In short, the world witnessed the fruits of decades of investment in intensive training and in new capabilities for battlefield surveillance, battle management, stealth, precision weapons, and several other cutting edge aerospace technologies. The result was a dramatic—some would argue revolutionary—improvement in the capabilities of aerospace forces to locate, identify, engage, and attack a wide range of enemy assets and forces. These developments will have profound implications for the conduct of future joint military operations. Yet, more the ten years after Desert Storm, one finds little evidence of fundamental change in joint/service planning, force assessment, force

structure, or resource allocation within the U.S. Department of Defense. This suggests that, despite the evidence of recent history, many in the defense and civilian community lack a clear appreciation of aerospace power's capabilities and potential.

One possible contributing factor for this would be the Air Force's own unmitigated success—by making it look so easy over the last decade, others have simply overlooked or dismissed the significance of the growth in aerospace power's capabilities. Commenting on his tour as commander of the 31st Expeditionary Wing at Aviano during Operation Allied Force, Brigadier General Dan Leaf agreed: "The risk is not defined by the results. Our airmen, they made it look easy, but it wasn't."[1] While it is hard to find an operator in the Air Force who is not highly skilled at his or her craft, it has almost been as hard to find Air Force documents that reflect in simple terms the true advantages of modern aerospace power. In short, the Air Force has not told the story of modern aerospace power in a clear, compelling way to the larger defense and civilian community--but that is beginning to change. More or more advocates are jumping on board the aerospace power wagon, making it important now more than ever, that the Air Force properly lay out a cost effective and compelling plan for a modernized 21st century aerospace force.

This research paper was partly borne of frustration and curiosity. First, during a recent Pentagon tour, frustration with a Planning, Programming, and Budgeting System (PPBS) that seemed to hinder, rather than support, the exemplary efforts of many hard-working and visionary colleagues. Curiosity naturally followed, questioning whether or not a better process, or enhancements to the current process, were possible. If not possible or practical, a few follow-on questions became evident and form the thesis for

this paper: Despite the limitations of the current PPBS and Air Force planning processes, how should the U.S. Air Force prepare itself for the future? With so many burgeoning technologies on the horizon driven by a potential Revolution in Military Affairs (RMA), what are the most compelling modernization and force structure options available for a 2020 aerospace force?

The story begins with an overview of our current predicament--a strategy versus resources mismatch. The U.S. Air Force, overwhelming the force of choice since the end of the Cold War, is overly committed, stretched thin, suffering readiness and personnel tempo problems, and not resourced properly for our current national security strategy. Next, a brief discussion of the alleged RMA--is it reality or hype? Since some argue an RMA has the potential to fundamentally change the character of warfare as we know it, its validity and impact on a new force modernization plan are important. Following that, appraisals of the DoD PPBS and, more specifically, the Air Force corporate planning process are undertaken--are they functioning as originally intended? While this part of the discussion was never meant to offer solutions (many people much smarter have been trying for years), an appreciation of the current processes and some of their shortcomings is critical in understanding the planning framework for a USAF modernization plan.

Against this backdrop, the paper moves into an assessment of the current Air Force modernization plan, suggests a new model for integrated Air Force investment planning, and proposes several possible options for reprioritizing the current plan. The centerpiece of this analysis comes from an excellent briefing on Future Modernization Priorities and Processes presented by SAF/AQ and AF/XP at the Fall 1999 CORONA meeting.[2] Finally, any discussion of modernization and restructuring cannot avoid the inescapable

debate on affordability, which is covered in the last section--continuing as the lone, remaining world superpower is not cheap, but relatively affordable in our current, robust economy.

Notes

[1] Bruce Rolfsen, "Aviano Commander's Best Memory: Everyone Returning Safely," *Air Force Times*, 24 April 2000: 20.

[2] Gen Gregory Martin and Gen Roger DeKok, "Future Modernization Priorities and Processes," Briefing given at Corona Fall 1999.

Chapter 2

What if the Strategy Doesn't Match the Resources?

> *Pentagon planners remain wedded to the old Industrial Age priorities of mass and numbers, and political leaders have been reluctant to second-guess the uniformed experts. In the meantime, however, the United States has engaged in a series of military operations, from Somalia to the Balkans, that called for more agile, expeditionary and quickly decisive forces. The next administration must take on the politically difficult but essential task of trading Cold War mass for military modernization. Even in an era of surplus, we will not be able to sustain the force we have . . . We must choose, and the choices will be wrenching.*
>
> --Admiral (Ret) William Owens

The United States Air Force enters the new millennium with undoubtedly the world's most capable aerospace fighting force. Although it is nearly 40 percent smaller in size than at the end of the Cold War, today's U.S. Air Force is capable of global power projection and precision engagement that is the hallmark of a true superpower nation. The 1990's, in particular, produced several operational airpower successes and demonstrated a number of technical achievements—most notably during Operations Desert Storm and Allied Force.

Unfortunately, this new millennium may also represent the high point of post-Cold War military might unless the current substantial mismatch between strategy and resources is mitigated. There is growing evidence that future budget levels currently projected by DoD will not be nearly large enough to pay for upgrading and maintaining

the current planned force, while still conducting the wide range of military activities and operations necessitated by America's national security strategy, national interests, and global relationships.

One does not have to go back too far in history to note a similar "strategy versus resources mismatch" that resulted in substantial and dramatic foreign policy and force sizing changes for one of our closest allies. In 1968, Prime Minister Harold Wilson announced Britain would withdraw all of her forces worldwide "east of Suez" by the end of 1971. That withdrawal was the unfortunate culmination of a process of strategic realignment forced on the British government by ever-increasing security commitments and inadequate budget levels to maintain these commitments. This mismatch between strategy, forces, and resources could only be corrected by an immediate retrenchment of Britain's global commitments. While an orderly and planned withdrawal by the British government would have been preferable, the hasty retreat resulted in political vacuums in regions of interest to both the United States and Britain, and has resulted in problems for Western security to this day.

The United States should draw a cautionary lesson from our friend and the experience of what had been the world's greatest empire through the end of World War II. Our current combination of excessive ambition in foreign affairs, over stretching of U.S. military commitments, and an unwillingness to provide sufficient resources to maintain an adequate defense capability, threatens to confront the United States with the same problems faced by Britain only 30 years ago.

No one can foresee what events might precipitate a defense crisis of a similar scope to Britain's that, in effect, terminated their status as a great power. Already, tension

exists in the U.S. between surging non-defense discretionary spending and the demands of a high maintenance, high technology military. The trend during the post-Cold War period has been to use the "peace dividend" to fund the non-defense budget accounts, and has resulted in a military that has shrunk substantially in size and whose Reagan-era equipment buys are aging—even as commitments and overseas deployments have increased exponentially.

The U.S. Air Force may be approaching a point of no return, i.e., the "peace dividend" has been spent many times over and the "procurement holiday" is over. As will be discussed later, virtually our entire stock of military hardware will have to be repurchased over the next 30 years, yet few government officials are seriously contemplating the level of expenditures that would be necessary to upgrade and modernize the current force; not only along the lines of a Quadrennial Defense Review (QDR) directed force structure but, above and beyond that, a force that could integrate the cutting edge technologies of a potential Revolution in Military Affairs.

Although a notable aerospace power success story, Operation Allied Force also revealed the telltale signs of declining readiness that result from aging equipment, falling personnel retention, and underfunded operations and maintenance (O&M) and acquisition accounts. Ultimately, the prosecution and recovery from that war effort revealed a military that is stretched too thin around the globe and hard pressed to fight one major theatre war, let alone two as outlined in the QDR. Over the entire duration of the Cold War, the United States engaged in only 16 smaller-scale contingencies (SSC). By contrast, the U.S. engaged in 48 such operations in the 1990's alone, costing over $30 billion to date, and increasingly requiring a long-term commitment of money, personnel,

and equipment, with no end date in sight. This total includes 10 "contingencies" against Iraq for $8 billion so far, and 15 operations in the Balkans for $18 billion to date.[1] Spreading this substantial increase in commitments over a much smaller force has accelerated the operations and personnel tempo dramatically. At the end of FY98, 26 percent of the total active force was involved in deployments overseas.[2]

Despite these growing commitments and the promise of advanced weapon system technologies driven by a projected RMA, the U.S. has sharply reduced defense spending as a share of Gross Domestic Product (currently at the lowest level since before World War II and continuing to decline through the FYDP[3]--more on this subject later). Consequently, the military has been unable to invest in sufficient training, maintenance, new equipment, and retention of key personnel to maintain a modern force, or even the current readiness of an aging and increasingly less capable force.

Underfunding national defense is not new. What makes today's situation different is the fact that the equipment of the current force is running out of useful life—nearly all at once. Almost 25 years have passed since the start of the most recent major procurement cycle.[4] It goes without saying that military might is a temporary condition, since military hardware has a finite lifespan and must eventually be replaced.

Current Under Secretary of Defense for Acquisition and Technology, Jacques Gansler, summarized the current predicament DoD finds itself in:

> We are trapped in a death spiral. The requirement to maintain our aging equipment is costing us more each year: in repair costs, down time, and maintenance tempo. But we must keep this equipment in repair to maintain readiness. It drains our resources—resources we should be applying to modernization of the traditional systems and development and deployment of new systems. So, we stretch out our replacement schedules to ridiculous lengths and reduce the quantities of the new equipment we purchase—raising their costs and still further delaying modernization.

> Compounding this problem is the increased operational tempo required by our worldwide role as the sole remaining superpower, which more rapidly wears out the old equipment.[5]

The United States obviously cannot continue to play the global leadership role envisioned by the current national security strategy without a modest increase in defense spending or an unfortunate decision to significantly retrench foreign policy commitments and obligations worldwide. If we want to avoid a fate similar to that which befell Great Britain just a few decade ago, we must start now to achieve a proper balance between international commitments, force levels, and realistic budgets. These deliberations lead to a critical question for examination next: Do we fully fund the current programmed force structure or do we step up to the next level—funding the yet unproven promises of an American Revolution in Military Affairs?

Notes

[1] Rowan Scarborough, "Record Deployments Take Toll on Military," *Washington Times*, 28 Mar 00, 6.

[2] Daniel Goure and Jeffrey M. Ranney, *Averting the Defense Train Wreck in the New Millennium* (Washington DC: The CSIS Press, 1999), xi.

[3] Ibid., xii.

[4] Ibid., xv

[5] Jacques S. Gansler, "Remarks at the Defense Science Board: Summer Study Outbrief," 13 Aug 98, 3.

Chapter 3

The Revolution in Military Affairs: Reality or Hype?

> *We've now been living in an era for some 10 years for which we don't have a name. We don't know quite where we are and we certainly don't know where we are going. The one thing I do know with high confidence is that, if we extrapolate the present into the future, we will be wrong.*
>
> —Former Deputy Secretary of Defense John P. White

Should DoD be concerned that history may repeat itself? The U.S. military is no longer the upstart power of the 1920's and 1930's that could experiment at will, confident that Great Britain would police the planet and keep peace and order. Now America has inherited Britain's place and its problem: how do we keep the peace today while preparing for tomorrow's wars. In addition, this new age puts DoD under additional pressure. We are the lone superpower in an age where technological change is almost incomprehensibly fast, as a new generation of faster microchips emerges every 18 months. Many believe the microchip will change the face of war and the military must transform itself to keep up. This technological transformation even has a popular, if overused, name—the Revolution in Military Affairs.

Are we really in the midst of a revolution? If so, how does one manage it? How does the world's foremost military power harness the new technologies and adapt them for a new way of fighting, while maintaining the day-to-day military strength it needs to prevail in two nearly simultaneous major theatre wars and hosts of lesser commitments in

every corner of the world? Dr. Gansler put it another way: "We might have a war tomorrow. You can't just say, 'Well, we'll scrap all the old equipment and wait for the new stuff to come in.' Balancing these two needs—to protect the present and transform the armed forces for the future—poses a very real resource problem."[1]

Part of the problem is simply explaining to lawmakers and the general public what the "revolution in military affairs" is, and what it is not. For example, while Defense Secretary Cohen extols the new V-22 as "the revolution in military affairs in action," Congressman Mac Thornberry disagrees: "It's assembled in my district and I'm a very strong supporter, but it's not a revolution." He added that no single weapon makes a revolution and "my fear is, the search for that silver bullet encumbers the need to change the culture and the organization."[2] "I think the tougher battle is going to be over strategy and organization. If you look at some of the past revolutions in military affairs, what a lot of the scholars find is that the technology was the easy part. The new ideas, the changing of structures, the changing of culture was much more difficult."[3]

Andrew Richter, in his paper, "The American Revolution?," agrees: "Technology alone will not drive the RMA, for there needs to be a clear understanding of the military's tasks and corresponding changes in doctrine, tactics, and strategy."[4] Senator Joseph Lieberman is more optimistic on the synergistic effects of an RMA on the American way of war:

> The dizzying pace of global change means our military will have to confront very different challenges in the future, such as large-scale urban warfare, space warfare, electronic/information warfare, and chemical, nuclear, and biological warfare. But this rapidly-changing world also brings great opportunities. The eye-popping advances in technology we are engineering today are paving a path not just to a revolution in military affairs, but to a complete paradigm shift in the American way of war, a shift that will make us stronger and safer in the new century ahead.[5]

Andrew Krepinevich writes that there have been ten military revolutions since the fourteenth century: the revolutions in infantry, artillery, sail and shot, fortress, gunpowder, manpower, land warfare, naval warfare, mechanization, and nuclear weapons.[6] He also offers a widely accepted definition of an RMA: "When the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of a conflict."[7] Michael O'Hanlon in his book, *Technological Change and the Future of Warfare*, sees four specific technological premises in DoD's Joint Vision 2010 RMA hypothesis and similar schools of thought. First, improvements in computers and electronics will make possible major advances in weapons and warfare—most notably in areas such as information processing and information networks but also in communications, robotics, advanced munitions, and other technologies. Second, sensors will become radically more capable, in effect, making the battlefield "transparent." Third, land vehicles, ships, rockets, and aircraft will become drastically lighter, more fuel efficient, faster, and more stealthy, making combat forces more rapidly deployable and lethal once deployed. Fourth, new types of weaponry—such as space weapons, directed energy beams, and advanced biological agents—will be developed and widely deployed. While he contends the first technological premise is essentially correct, the second and third are badly overstated and the fourth is not easily evaluated at this point.[8]

More fundamentally, the RMA has several parts that can be categorized into two broad areas: "smarter" weapons and information technology. The first one is very

familiar to the public from Pentagon-supplied videos of pinpoint accurate laser- and GPS-guided bombs and cruise missiles flying hundreds of miles with final target errors of only a few feet. Microchip technology makes these weapons possible and is making them better every year. The old paradigms of volume and size for weapons saturation are being replaced by smaller, stealthier, and more precise.

The more fundamental and exciting change from the RMA is in the second category--information technology. Simply put, new technologies allow us to collect more information about the enemy and our own operations, and disseminate it more quickly than ever before. This RMA is about "information dominance" and is based on technological advances that have increased the ability to collect vast quantities of data; to convert that data into intelligible information; and to rapidly transmit that data anywhere on the globe. Sensors, satellites, and computers can now collect vast amounts of information, and the promise and challenge lies in managing all that information so that it helps the warfighters without overwhelming them. The fact that the computing power of yesterday's room-sized mainframes can now fit in the nose of a weapon or in a soldier's hand, makes possible entirely new ways of waging war.

The most dramatic possible advance in information technology, coined by DoD as Dominant Battlefield Knowledge, would be to link everyone, from infantryman to fighter pilot—the Army, Air Force, Marines, and Navy would all share information over one common network and would be able to promptly find and continuously track virtually all important enemy assets within a combat zone.[9] Retired Admiral William Owens adds: "We now have a pretty good idea that the American RMA stems from the way several particular technologies will interact. Most senior military and civilian leaders agree that

the specific technologies are those that allow us to gather, process, and fuse information on a large geographical area in real time, all the time; that allow us to transfer that information—call it knowledge—to our forces with accuracy and speed; and that provide us the capacity to use force with speed, accuracy, precision, and great effect over long distances."[10] Theoretically, everyone would know where every other friendly unit was, and when anyone spotted the enemy, the joint force or coalition commander could unleash an immediate and lethal symphony of attacks from air, land, sea, and space. In one 1998 joint experiment utilizing such a network in a South Korean exercise, Navy Aegis radars aboard ships spotted enemy artillery that were attacking the Army on land, while Army helicopters were at sea sinking small enemy patrol boats.[11] The beauty of the information part of the RMA, and the crux of O'Hanlon's argument, is that no new wonder weapons or "silver bullets" are necessary for this revolution. Instead, the all-encompassing network provides the battlefield knowledge necessary to use our existing weapons much more effectively.

O'Hanlon concludes his investigation of the RMA with a mixed, but generally skeptical, verdict on the contemporary RMA hypothesis:

> New technology and associated tactical and operational innovations clearly have considerable potential to make important contributions to warfare by 2020. But it is equally clear that many fundamental limitations will be hard or impossible to overcome. That means combat will, in many ways, be similar in 2020 to its current nature. It also casts doubt on the hypothesis that a revolution in military affairs is under way and that a major transformation of the U.S. military is now required—or even prudent.[12]

In the end, preparing for the wars of tomorrow is necessary, but expensive—in terms of money, time, and intellectual energy. And so too is defending American interests abroad today. As Admiral Owens commented: "The problem with deep, fast, and

rampant innovation is not getting people to accept the new, but to surrender the old. Most will flirt with the future, but few want to embrace it at the expense of a comfortable present."[13] The tough question is how to strike the right balance. "Revolutionary is the appropriate word for the change that has to happen", said Gansler, but "we're going through that, of necessity, in an evolutionary fashion."[14] O'Hanlon highlights the fiscal reality of the RMA and sets the stage for further prioritization discussions in this paper: ". . . the Pentagon needs to find ways to prioritize, and keep its appetite for new weaponry in check, given the unlikelihood that defense budgets will increase enough to fund its entire modernization agenda. If the RMA movement does not help the Pentagon to prioritize, it will have made the fiscal problem worse rather than better."[15] No one can definitely prove or disprove the RMA hypothesis, but the extensive nature of the debate has been valuable—especially for the Air Force--arguably the service to benefit most from cutting edge, revolutionary technologies, as it embarks on serious deliberations over future force structure and modernization priorities. Against this backdrop of technological innovation, it's time to enter the more mundane, but equally important business of processes, specifically the Pentagon's PPBS process--the overarching DoD framework that any revamped Air Force modernization plan would have to be developed and operate under.

Notes

[1] Sydney J. Freedberg Jr., "Future-Shock Troops," *National Journal*, 11 Dec 99, 3525.

[2] Ibid., 3520.

[3] "One on One," *Defense News*, 25 Oct 99, 30.

[4] Andrew Richter, "The American Revolution? How Advanced Western States Are Responding to the Revolution in Military Affairs," *National Security Studies Quarterly*, Autumn 1999, 6.

Notes

[5] Senator Joseph Lieberman, "Transforming National Defense for the 21st Century," Opening Address Before the U.S. Army Conference on Strategic Responsiveness, 2 Nov 99, 2.

[6] Andrew Krepinevich, "Cavalry to Computer: The Pattern of Military Revolution," *The National Interest*, vol. 2 (Fall 1994), 31-36.

[7] Ibid.

[8] Michael O'Hanlon, *Technological Change and the Future of Warfare* (Washington DC: Brookings Institution Press, 2000), 2.

[9] Ibid., 13.

[10] Adm (ret) William A. Owens, "The Revolution in Military Affairs," *Joint Forces Quarterly* (Winter 95-96), 37.

[11] Freedberg, 3522.

[12] O'Hanlon, 139.

[13] Owens, 37.

[14] Freedberg, 3525.

[15] O'Hanlon, 170.

Chapter 4

What's Wrong with PPBS?

> *Decisions about which weapons to buy, and how many of them, are made by the independent services –almost as if they were going to fight separate wars.*
>
> —Jacques Gansler

Every organization, from the smallest privately owned business to the largest corporation, has a strategic planning process. For the small firm, this process may be no more elaborate than the owner's thoughts at the end of the day on what to do tomorrow to increase revenues, reduce costs, or beat the competition. For the largest corporations, the CEO and other corporate officers provide similar advice on these same topics, but detailed planning, analysis, and the development of options and strategies are commonly left with a dedicated strategic planning staff. Despite these differences in scale and formality, the necessity of planning for the future is widely accepted.

Harvard Business Professor Henry Mintzberg describes a strategic planning process as, "a formalized procedure to produce an articulated result, in the form of an integrated system of decisions."[1] This definition accurately describes the aspirations of DoD's strategic planning process, known as the Planning, Programming, and Budgeting System (PPBS). Professor Mintzberg further identifies several motivations for establishing and maintaining strategic planning processes, including: (1) coordinating activities; (2) ensuring the future is taken into account; (3) being rational; and (4) establishing control.

Of these considerations, the second is the most significant for all organizations, especially those in highly competitive and dynamic markets, who want to ensure they are preparing for inevitable changes, preempting those that are undesirable, and controlling those that are controllable.[2]

Since first installed in 1961 by Defense Secretary Robert McNamara, PPBS has endured without fundamental change for over 38 years and through 8 administrations, both Democrat and Republican.[3] What Secretary McNamara hoped for was a fully integrated process producing a true defense budget, reflecting the requirements of the Defense Department as a whole, rather than the separate, often differing, perspectives of the individual military services. Unfortunately, as will be seen later even within the Air Force, a stovepiped approach with little horizontal integration, is prevalent.

On an initial positive note, PPBS has grown in size and complexity while continuing to provide the fundamental structure under which military strategy is developed and translated into the annual defense budget. Although many believe that PPBS is simply the Pentagon's budget formulation and accounting mechanism, in concept it is supposed to serve a much broader role. In practice, unfortunately, it has become increasingly focused on just the budget function and allowed the planning function to disconnect and become somewhat disjointed from the total process. Similarly, the programming function has become increasingly less integrated in the services and between services. These trends, which have accelerated since the end of the Cold War, have resulted in a process that is not well integrated and a budget that is becoming less and less connected to a joint military strategy and future threat response. To some, PPBS is a marvel of

management; to others, a classic case of bureaucratic excess. Professor Mintzberg described PPBS as one of the "greatest planning efforts, and failures, of all times . . ."[4]

While the PPBS is centrally directed and controlled, its execution is de-centralized--budgets are actually prepared by the services and submitted for review and approval to OSD. The services have their own processes and organizations for performing this function (which will be discussed in more detail later for the Air Force) and coordinate extensively with their own internal commands and, to a lesser extent, with the regional CINCs. This bottoms-up approach gives the services considerable leverage, as they not only have the power of the first draft, but are recipients of the funds once they are appropriated by Congress. Although program and budget reviews by OSD can last over six months, and the congressional appropriations process takes nearly a year, recent experience indicates the services receive over 90% of exactly what they originally request.[5] While the nation expects the services to go to war together, the extent of their cooperation in arming for war is surprisingly limited. Each service operates according to its own interpretation of the requirements needed to execute DoD's overall military strategy. They budget, plan for, develop and procure weapons largely on their own, with each service controlling about one-third of the budget. While OSD oversees and approves the service budgets, in practice, its control is limited.[6]

So, does PPBS have problems? The opinions vary. Although there is a widely held view among many who have worked in the Defense Department preparing plans, balancing programs, and formulating budgets, that PPBS is an inefficient, laborious, wasteful, and outdated process, many others in and outside DoD have a much more favorable view. A senior official at another major executive branch department stated

that "when it comes to planning and long range decision making, the Pentagon really does that well. All we have to deal with are people and buildings. The Defense Department deals with a vast array of resources through its PPBS process in a remarkably effective manner."[7]

The opinion of PPBS on Capitol Hill is more mixed. In general, Congressional staffers feel PPBS provides them the essential information and supporting data needed to carry out their responsibilities. This view is primarily focused on the budgeting function of PPBS. Their principal interest is the presentation of a defense budget in a timely manner to initiate the annual authorization and appropriation process, which is detailed enough to allow for often microscopic examination. Clearly the Pentagon is fully capable of generating this enormous detail, and the Congressional staff's appetite for exact budget data at the lowest levels encourages this behavior. Members and staff have little interest in just seeing macro-level, top-line figures, such as you would see in a British defense budget. Nonetheless, a growing contingent in Congress have expressed concerns that the defense budgets they receive do not clearly relate to strategic demands, nor fully reflect integrated, rational decision-making. Senator Charles Robb (D-VA) warned that the more the Pentagon fails to establish a "framework linking objectives to programs," the more it invites congressional interference in trying to understand the logic and make that linkage for them.[8] In fact, in the 1998 Defense Authorization Bill, Congress expressed its concern by directing the Pentagon to review the "adequacy of the Program, Plans, and Budgeting System in fulfilling current and future acquisition needs of the Department."[9]

Given such a wide dispersion of opinion on PPBS, maybe the best approach for an evaluation is to compare the current process with the original intentions of those who developed it. The original concept of a PPBS was built around six basic beliefs:

1. Decision-making Based Upon Explicit Criteria of National Interest

Although Secretary McNamara felt that OSD provided clear guidance to the services, over time, specific guidance regarding actions, outcome expectations, and priorities has greatly diminished.[10] The planning part of the process produces few such explicit, detailed criteria, and when it does--such as the case of the two MTW strategy--they are rarely met. When the Defense Science Board was asked to evaluate readiness in 1993, an unexpected answer came back: "A major challenge has been to answer the question--'Ready to do what?' This is due to the absence of a current National Security Strategy and its follow-on National Military Strategy."[11] In the absence of explicit criteria on what readiness was, how it was measured, and what parts were uniformly important across all services, there was little possibility that resources could be systematically allocated by the PPBS process to either enhance or repair it. Although this is just one example, in general, planning guidance that starts at the National Security Strategy level and works its way down to the services through various other planning documents, is of little use in providing guidance and priorities to the services for preparing programs and budgets.

2. The Simultaneous Consideration of Military Costs and Needs

The services have had some more success in this area, but in the absence of clear guidance on strategy or priorities, as outlined above, it is difficult to make meaningful decisions on the tradeoff of costs and needs. In particular, the tendency to focus on near-

term procurement costs at the expense of long-term total life cycle costs is prevalent. Critical shortages in ISR platforms, electronic warfare assets, and precision munitions, despite their success in recent contingencies, suggest the disconnect between current force structure and operational demands is caused in part by the lack of a robust tradeoff between both short-term and long-term costs and current and future needs. In his book, *Lifting the Fog of War*, retired Admiral William Owens suggests a possible solution for this disconnect by forming a new Joint Requirements Committee that "would become the center of the Pentagon's primary responsibility to analyze and define the shape of the future U.S. force structure, and to determine what military capabilities the force would require."[12]

3. The Identification and Consideration of Viable Alternatives to Current Programs

While extensive analyses of alternatives to specific programs do occur, rarely do activities that generate alternatives across major program areas take place. Despite the frequent rhetoric to "think outside the box," service cultures and parochial interests prevent a true alternative process from occurring. Consequently, a common challenge in DoD strategic planning efforts is the limited ability of those involved to step beyond existing organizational structures and explore options residing outside their current confines. Henry Kissinger, while addressing government planning efforts, commented on this constraint: "What passes for planning is frequently the projection of the familiar into the future."[13] James Brian Quinn noted that annual planning processes were rarely "the source of new key issues or radical departures into entirely different realms. These almost always come from precipitating events . . ."[14] For example, despite extensive

experimentation and evaluation during the inter-war period, the Navy never firmly decided between the battleship and the aircraft carrier as its primary offensive platform until the "precipitating event" of Pearl Harbor decided it for them. A clear objective of PPBS is to identify alternatives before such tragedies occur. Another clear intention of PPBS is to use it as a mechanism for shaping alternatives to service programs and integrating them by making trade-offs between services for a better overall DoD product. By focusing on defense outputs instead of service inputs, the expectation has been that OSD would formulate major program alternatives to service proposals. Theoretically, the OSD staff, having full visibility across services and little career loyalty to them (certainly not true for active duty staff members), would identify major trade-offs between them and form a better, integrated defense program. Early in McNamara's tenure, the OSD staff was fairly successful in doing just that with the strategic forces program, by developing detailed program objectives and non-service-specific performance measures for strategic weapons systems. More recent experience, however, has produced less successful results. With few detailed objectives out of the planning phase, there is little criteria to measure the potential success and impact of service programs, and therefore little basis for developing alternatives. As a result, service programs submitted to OSD during the programming phase of PPBS are little changed during OSD review. In an attempt by Congress to stimulate more alternatives, the Goldwater-Nichols Act gave authority to the Chairman of the Joint Chiefs to develop "alternative program recommendations and budget proposals within projected resource levels and guidance."[15] Unfortunately, the results of these "Chairman's Program Assessments" have been just as disappointing in terms of producing major program alternatives.

4. The Creation of an Analytical Staff Directly Supporting the Defense Secretary

Robert McNamara clearly perceived the need to have staff expertise that offered perspectives unrelated to service preferences and directly responsive to him. Therefore, the Office of Systems Analysis was established with about 20 analysts, and provided the Secretary the original, non-parochial analysis he desired. Unfortunately, since then, the planning and analytical staffs at the joint level and in the services have grown significantly. Even the functions of the Joint Staff, which used to concentrate primarily on planning and operational issues, now include programmatic and budgetary matters as part of their growing number of responsibilities. With so many players, each presenting different alternatives, the process is more likely to confuse than clarify understanding of the real issues and options available. As one senior official noted, "We seem to have developed a bureaucratic process designed to not let anything bad happen too quickly. Of course, it doesn't allow anything good to happen too quickly either."[16]

5. The Projection of Foreseeable Forces and Costs in the Future

Yearly fiscal guidance from OMB forces services to make decisions on which programs to fit under their budget ceilings (topline) in the Future Years Defense Plan (FYDP). Projected costs beyond the FYDP (outside six years), however, are largely uncontrolled and based on best case assumptions, resulting in a understated "bow wave" type effect. So, in effect, PPBS can only force near and mid-term decisions on costs with relatively short-lived fidelity. This failure to project realistic, total life-cycle costs and budgets is believed to equate to a shortfall of $50-60 billion per year, and fosters constant churning of program plans when the reality of true costs become apparent. Dan Goure of

CSIS figures DoD has already deferred into the future $426 billion in procurement purchases during 1993-2000. Adding another $389 billion for deferred purchases in 2001-2005 rolls over a total of $815 billion into the procurement bow wave for 2006 and out. Funding the deferred procurement items alone would add another 23 percent to the annual Defense budget in 2006-2020.[17] If the trend continues, the accumulation of prior-year unfunded purchases will result in a procurement due bill that can never be paid. Force structure, equipment inventories, and munitions stockpiles therefore would have to shrink at the rate military equipment is finally retired because of physical obsolescence or prohibitive costs.[18]

6. Decision-making Founded Upon Open Analysis and Debate

In general, a lot of debate occurs during the PPBS process, but there are recent disturbing trends in the subsequent analysis and decision-making. The Deep Attack Weapons Mix Studies, produced prior to the 1997 QDR, is one example. After 20 months of study and $12 million in analytical costs, the Pentagon was unable to develop recommendations to significantly realign its plans to spend $10 billion over the next decade on long-range attack systems. When cold-war era computer models favored Army systems, the Navy and Air Force challenged the outcome. In addition, senior OSD officials informed the Army that even if more munitions for them were warranted, they would have to resource them from within their own budget allocation, instead of receiving funds from the other services as their corresponding systems were reduced or eliminated.[19] This statement, as discussed earlier, is totally at odds with the intent of PPBS--to reallocate funds across services in the best interests of a stronger defense program. The alternative is to continue to give each of the services their standard share

of the defense budget without discussion—in essence "making defense strategy in the comptroller's office."[20] More recently, Army Secretary Louis Caldera voiced his desire for financial redistribution, in light of the Army's new transformation strategy: "It is important and healthy for the nation, from time to time, to look at how it is distributing its dollars within the Department of Defense. No company would sit there and say, 'I'm going to operate next year . . . using exactly the same funding formula I did last year, and I'm going to do it purely on a historical basis and not on the basis of . . . where the best return is for investment for the future.'"[21]

So, where does PPBS stand today in terms of what it was initially intended to provide? Despite the best intentions of many smart people who have tried to modify and enhance the process, PPBS has not been totally effective in integrating service programs and allocating resources according to established top-level national security priorities. Former Army Chief of Staff Maxwell Taylor lamented on the lack of allocation flexibility: "The maintenance of the rigid percentage distribution by service of the budgets since 1953 is clear proof of the absence of flexibility in our military preparations. This frozen pattern could only be justified if the world had stood still since 1953 and I doubt that anyone would say that it has."[22] When Secretary of Defense Les Aspin published his Bottom-Up Review (BUR) in 1993, it stated right up front: "We cannot, as we did for the past several decades, premise this year's forces, programs, and budgets on incremental shifts from last year's efforts."[23] This encouraging comment was consistent with the initial concepts of PPBS and the intent of the BUR to restructure the armed forces from the bottom-up. At the end of the exercise, however, the percentages of the defense program allocated to each service were essentially unchanged. By nearly every

measure, the BUR reductions were uniform and proportional across the services. Another telling example: following the 1997 QDR, the changes directed by OSD and the Joint Staff to the service programs and budgets amounted to about 0.5% of the total dollar value of the programs being reviewed.[24] Does this mean the services, working in isolation, got it over 99% correct in terms of an integrated defense program? Or does it highlight a growing tendency for OSD to work the minor issues and avoid confrontation over the major ones?

The concern remains over the continuing consistency of the services' resource percentages and the inability of the current PPBS process to significantly reshape the defense program across well-defined service stovepipes. Instead of charting a path to the future, it produces results similar to those of the past, even during a period of significant strategic and technological change. If the RMA is really here, it would seem DoD lacks the tools to take advantage of it.

Despite the problems and frustrations cited above, it would be unfair to leave this discussion on a completely negative note. The many successes American forces achieved during the Cold War and subsequently on numerous battlefields around the world since then, culminating today as the world's one remaining military superpower, offers evidence that DoD must be doing something right. On balance, it's hard to disagree with the fact that the PPBS process has played a more positive than negative role during this ascendancy. However, the question remains: How can we make it even better for the future? In the next section, we'll follow this trail of predictable resource allocation and stovepiping to the next lower organizational level--within the U.S. Air Force.

Notes

[1] Henry Mintzberg, *The Rise and Fall of Strategic Planning* (New York: The Free Press, 1994), 12.

[2] Ibid., 16-21.

[3] "Framing the Problem of PPBS," *BENS Special Report* (January 2000), 2.

[4] Mintzberg, 19.

[5] "Framing the Problem," 7.

[6] Katherine McIntire Peters, "The Right Stuff," *Government Executive* (Dec 99), 6.

[7] "Framing the Problem," 8.

[8] Charles S. Robb, "Rebuilding a Consensus on Defense," *Parameters* 26, No. 4 (Winter 1996-97), 8.

[9] National Defense Authorization Act for Fiscal Year 1998, Section 912, "Defense Authorization Workforce," subsection (d)(11).

[10] "Framing the Problem," 10.

[11] Edward C. Meyer, *Defense Science Board Task Force on Readiness, Final Report*, U.S. Department of Defense, 21 Jun 94, 3.

[12] Robert Holzer, "U.S. Military Chiefs Seek to Strengthen JROC," *Defense News*, Vol. 2, No. 2 (10 Apr 00), 20.

[13] Mintzberg, 179.

[14] Ibid., 108.

[15] Title 10, Section 153, U.S. Code, Committee on Armed Services of the House of Representatives (Washington DC, U.S. Government Printing Office, April 1993), 52.

[16] "Framing the Problem," 13.

[17] Goure, 100.

[18] Ibid., 101.

[19] Jason Sherman, "Bombed: A 20-month, $12 Million Pentagon Deep Attack Study Yields No Explosive Recommendations on Munitions," *Armed Forces Journal International*, June 1997, 14.

[20] O'Hanlon, 15.

[21] *Inside the Pentagon*, 2 Mar 00.

[22] Maxwell D. Taylor, *The Uncertain Trumpet*, (New York: Harper and Brothers, 1959), 129.

[23] Les Aspin, *Report of the Bottom-Up Review* (Washington, DC: U.S. Department of Defense, Oct 1993), 1.

[24] "Framing the Problem, 20.

Chapter 5

What About Air Force Planning?

To govern, as they say, is to choose. To choose requires the assertion of priorities, which often provokes conflicts

--Brookings President Michael Armacost

Given a rather mixed review of DoD's PPBS, how well does the Air Force plan, program, and budget within its own service organizations? Again, going right to the punch line, the results vary depending on where you sit.

First of all, Air Force leadership continues to struggle with the issue of who really has the lead role for corporate Air Force planning. Should it be handled primarily by the Major Commands (MAJCOMs) with some overarching, generic, headquarters' guidance? Or should the process be highly centralized with headquarters establishing guidance for the MAJCOMs, who in turn develop and implement initiatives based on this guidance?

The truth is, current Air Force planning is a highly decentralized process that is conducted primarily within the individual MAJCOMs away from the Air Staff. The current MAJCOM processes have a common thread in that they are all based on a strategy-to-task (STT) concept, in which tasks and their associated capabilities are theoretically derived from the national military strategy and support CINC missions. Although all the MAJCOMs use some variety of this STT framework, no single, common

framework exists throughout the Air Force. The current planning process is built around each MAJCOM developing its own STT documents, based on the missions for which it provides Air Force capabilities. These sets of capabilities are aligned under Air Force-identified core competencies. For example, Air Combat Command (ACC) oversees all requirements and provides resourcing for tasks associated with the Air and Space Superiority core competency.

As a consequence of this decentralization to the MAJCOM level, the number of similar and parallel MAJCOM planning documents has grown, fueled primarily by MAJCOMs acting in isolation. Where responsibility for a program area was not clear cut or the function cut across multiple commands, the MAJCOM developed their own Mission Area Plan (MAP) for the applicable capability or function. Although there is usually only one master plan in the Air Force for what are perceived as core MAJCOM missions (e.g., Air and Space Superiority), the number of supporting or functional plans grew in some cases to one for each command. As a result, there is no vantage point from which to make Air Force-wide corporate strategic decisions. For example, Information Operations (IO) is treated as a separate activity by several MAJCOMs, each with their own distinct MAP and resourcing strategy. The IO MAPs are rarely coordinated outside the authoring command with other MAJCOM IO MAPs, although the Air Force Information Warfare Center provides some informal integration of the plans it reviews.

The current MAJCOM STT process focuses primarily on program planning, with an emphasis on modernization. Often, critical institutional functions, such as non-operational training, leadership development, and quality-of-life issues, are not given full visibility at the MAJCOM level in the resourcing process. There is also little consistency

in terminology between MAJCOMs--what may be a mission area to one might be a function to another.

MAJCOM requirements and resourcing strategies are adjudicated within their own assigned resourcing stovepipes, which are aligned primarily along core competencies. Although Air Force core competencies are useful in shaping vision and planning initiatives, they are too broad to establish meaningful priorities and cannot be used independently to determine resource requirements.[1] This stovepiped MAJCOM approach hinders the development of corporate Air Force options and affects total Air Force resourcing since there is little horizontal integration across MAJCOMs. The next chapter will clearly illustrate this problem. In addition, the most powerful MAJCOMs drive the resourcing priorities. Because the resourcing requirements and recommended allocations are developed within the MAJCOMs prior to corporate Air Force review, the Air Staff has few mechanisms for early viewing of all Air Force requirements and setting institutional priorities. This approach also inhibits the identification and achievement of long-term institutional goals, and hinders the ability to make strategic trades across separate MAJCOM functional areas.

One would be remiss to think the Air Force is the only service with these problems—both the Army and Navy also wrestle with issue of what the right balance is between corporate and field involvement in their service planning functions. In fact, a recent RAND study evaluated how the Army, Navy/Marine Corps, and Air Force operated their planning and programming functions.[2] The study found that although each service suffers some unique issues with their own internal processes, to their credit, both the Army and Navy practice a much more centralized approach to corporate decision-making

and guidance, i.e., compared to the Air Force, initial corporate direction for investment planning is significantly stronger in their services.

Since horizontal Air Force integration does not usually occur before MAJCOM MAPs are formalized, MAJCOM capability plans focus primarily on solutions within the command's stovepipe functional areas. Consequently, little is done to look Air Force-wide across other MAJCOMs for new, complementary, or possibly more cost-effective capabilities. An improved process is needed to identify areas where cross-cutting innovative solutions and strategic trade-offs can be made before entering the more structured and less flexible Air Force corporate programming and budgeting process, and that is the path we embark on next.

Notes

[1] Clark Murdock, "Strategic Planning in the Air Force: An Update (briefing)," Washington DC, 28 Apr 98.

[2] RAND Corporation, "Service Responses to the Emergence of Joint Decision-making (briefing)," 6 Aug 99.

Chapter 6

Air Force Modernization: Current Assessment

> *. . .it is not really necessary to look too far into the future; we see enough already to be certain it will be magnificent. Only let us hurry and open the roads.*
>
> --Wilbur Wright
>
> *Man will not fly for 1000 years.*
>
> --Orville Wright

As discussed earlier, there is a growing disconnect in DoD between strategy and resources, and it is especially evident in the USAF. While high operations tempo (OPSTEMPO) is shortening the service life of our current force structure, unified CINCs continue to add to their list of desires and needs to better meet the requirements in their theater of operations. Air Expeditionary Forces (AEF) have been introduced in the Air Force to improve the operational management of forces and that should help reduce the personnel tempo (PERSTEMPO) problem. Unfortunately, the AEF construct further highlights the growing disconnect--not enough force structure with the right capabilities to meet the demands of our current national military strategy. Meanwhile, the Air Force vision calls for an evolution towards a combined space and air force--a force with the capability to project power at long-range with lethal and non-lethal means; with abilities to find, fix, assess, track, target, and engage anything that moves on the earth; abilities to orchestrate operations through a real-time command and control network; and the ability

to rapidly deploy within 3 days to fight anywhere. Obviously, it is impossible to meet all of these demands, along with the growing Operations and Maintenance (O&M), personnel, and readiness demands, and still live within the bounds of the current and projected Air Force budget.

The heart of the analysis in this section is built around a recent AF Task Force effort undertaken to investigate the question: "What are the appropriate force structure mixes/capabilities and modernization priorities and processes for our 21st century Expeditionary Air Force (EAF)?" The work was excellent and deserves further elaboration and discussion. The underlying theme of the study was that we are not currently structured in the USAF to effectively make tradeoffs between resources and requirements, especially at the Air Force corporate level, as pointed out in the previous chapter. In addition, given the realities of current budget constraints, the AF will have to make very difficult choices at all levels in order to meet current mission demands, while at the same time making progress toward the vision for a 21st century aerospace force. Therefore, a new integrated process that balances the demands of near-term operations with future capability requirements, is a must.

Consider figure 1, a graph showing two divergent lines.

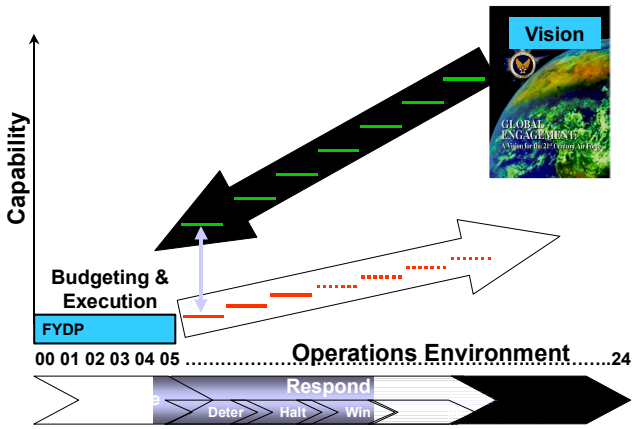

Figure 1. Vision vs. Reality

One line, starting with our current FYDP and extending into the future, represents our current baseline modernization plan--a relatively shallow incline constrained by budget realities and the costly expenses associated with maintaining our current, aging force structure. The second line starts at a higher point, representing a vision of where we would like to be in 20 years, and works backwards towards the same staring point. That line, of course, represents a much steeper change in capability required with costs unconstrained. The challenge the AF faces today is how to link those two diverging slopes into a single coherent path--ready to respond to today's conflicts, while also evolving toward a future vision.

The answer to the challenge it to build an investment strategy that is founded on "capability assessments" of today's and tomorrow's aerospace forces, while establishing specific "capability objectives" to pursue for the modernization efforts (see figure 2). Tying the two together is an "aerospace tradespace" where robust tradeoff debates can occur based on valid data and quantifiable metrics. Theoretically, this new investment strategy can now more effectively build a smooth transition that links the present and the

future, rather than last-minute drastic shifts in focus and resources that the current diverging slopes would tend to indicate.

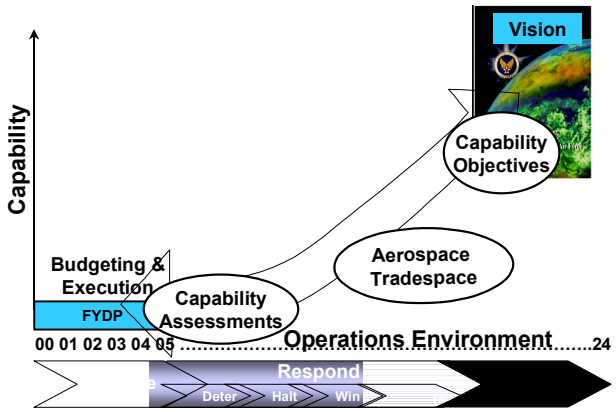

Figure 2. Aerospace Tradespace

With the current approach to mission area capability assessments, the individual MAJCOMs have primary responsibility for their various Mission Area Plans (MAPs), as discussed earlier. However, because of the growing diversity of force capabilities that contribute to more than one mission area, the total capability within any one mission area can only be found by searching and cross-referencing through multiple MAPs and multiple commands (see figure 3 & 4). Compounding this confusing issue is the increasingly complex relationship between Joint Taskings and Air Force Taskings (see figure 5).

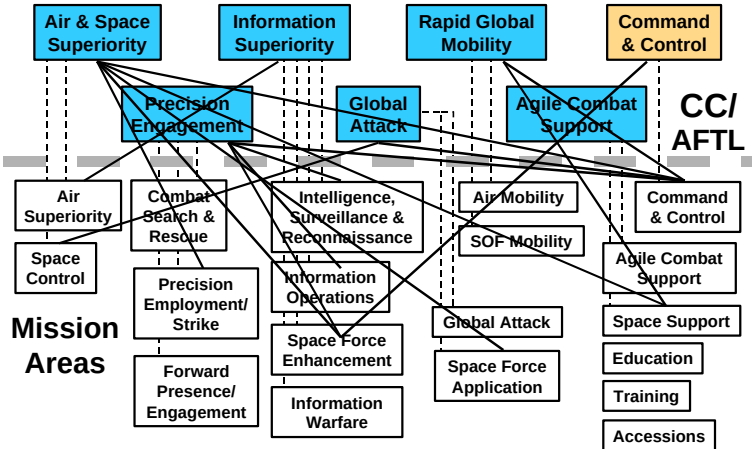

Figure 3. Complex Relationships: AF Core Competencies and Mission Areas

Mission Area Plans

P - Primary (Owns MAP)
S - Support (Functional Area)
✓ - Support (Specific Issues)

	Global Attack	Precision Employment/Strike	Space Force Application	Information Warfare	Information Operations	Air Superiority	Space Control	Forward Presence/Engagement	Intelligence, Surveillance & Recon	Space Force Enhancement	Air Mobility	SOF Mobility	Command & Control	Agile Combat Support	Space Support	Combat Search & Rescue	Accessions	Education	Training
ACC (& PACAF, USAFE)	P	S	S		S	P	S	S	S	S			S	P		P		S	✓
AETC														✓	S		P	P	P
AC2ISRC				P	S		S		P	S			P	✓					✓
AFSOC		P		S	P			P			S	P	S	✓		S			✓
AFSPC	S	S	P	S	S	✓	P	✓	S	P			S	✓	P	✓		✓	✓
AMC	S	S						S			P	S	S	✓		S			✓
ANG	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
AFRC	S	✓		✓	✓	✓	✓	✓	✓	S	S	✓	✓	✓	✓	S		✓	✓

Figure 4. Complex Relationships: Mission Area Plans and MAJCOMs

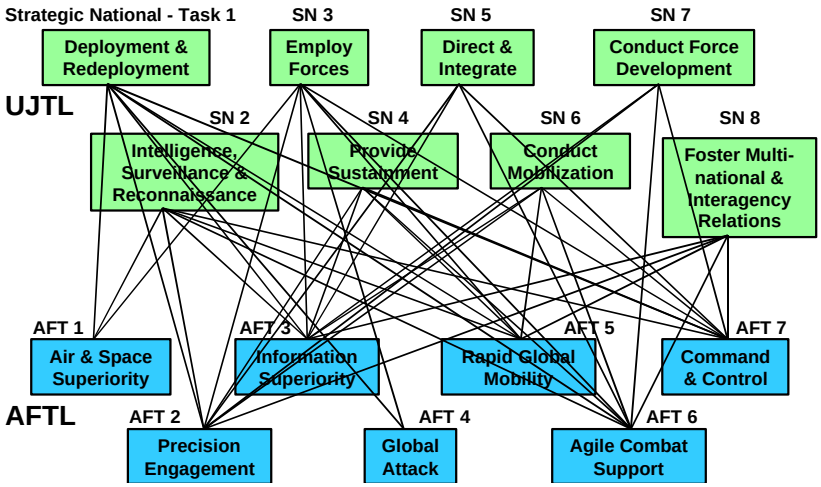

Figure 5. Complex Relationships: Joint Taskings and Air Force Taskings

Given these confusing and complex crosslinks, any further effort at the corporate AF level to integrate all of these cross-cutting and sometimes duplicative relationships becomes almost impossible. In fact, the first AF-wide attempt at force structure and system trade-offs occurs at the senior leadership level (AF Group, Board, Council) late in the programming cycle, and even that effort is focused primarily on balancing the bottom line budget numbers in the FYDP, as opposed to tradeoffs toward a strategic vision (see figure 6).

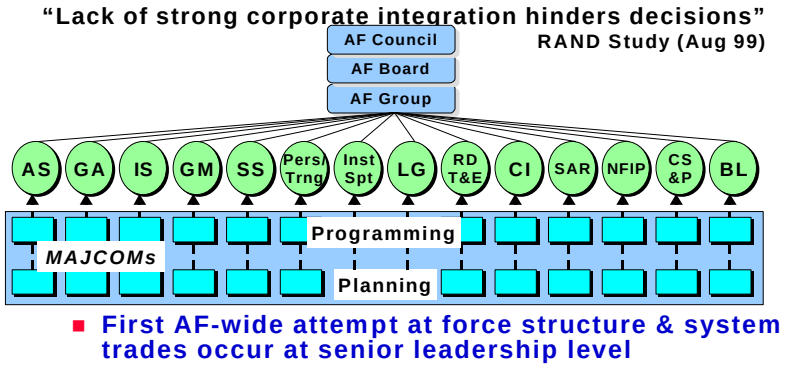

Figure 6: HAF Resource Allocation and Bottoms-up Planning and Programming

The previously cited RAND study highlighted this problem for the Air Force by noting: "a lack of strong corporate integration hinders decisions," "Air Force processes are stove-piped," "panels consider only their missions or functions with no integration across missions/functions nor across panels," "all planning and programming is decentralized down to the MAJCOMs with no centralized integration analyses or substantive tradeoffs at the corporate Air Force level."[1]

This lack of an early integration and tradeoff effort to assess and field new capabilities puts the Air Force in a difficult position as it evolves AEF packages to address the sometimes rapidly changing operational environment we face today and project for the future. A decade ago, our worldwide commitments were fairly steady and predictable, so we were able to respond to Desert Storm reasonably well with the forces on hand. Since that time, however, the OPSTEMPO has increased dramatically and the number of deployed aircraft overseas on a daily basis has increased from 20 a decade ago to well over 200 for the past seven years (see figure 7).

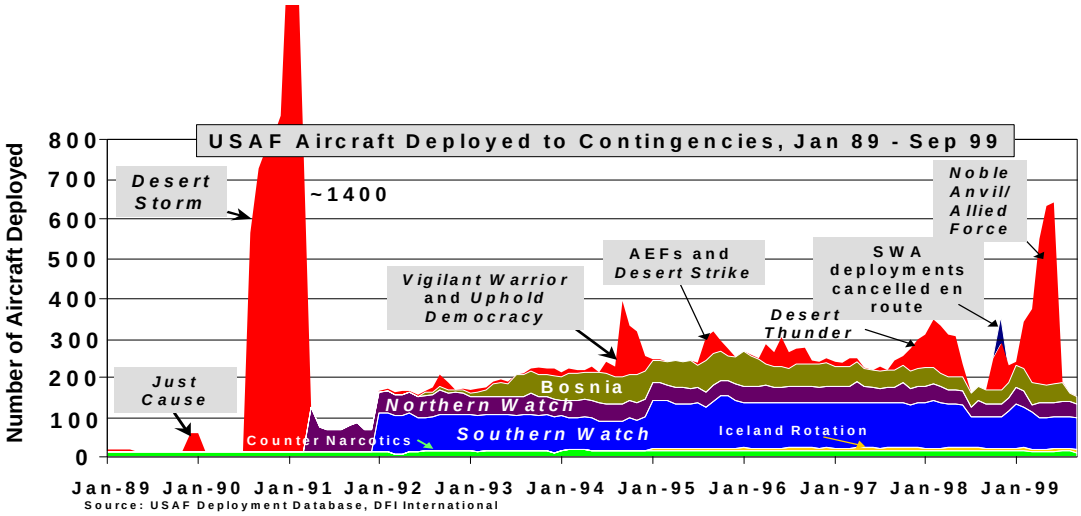

Figure 7. Increasing Operations Tempo

In light of this assessment, the need for a new and improved investment planning model becomes clearly evident.

Notes

[1]RAND Study, "Service Responses to the Emergence of Joint Decision-making."

Chapter 7

A New AF Integrated Model for Investment Planning

You design military strategy by thinking about it from the top down, projecting what the country is going to encounter and how that translates into potential need for military force, and then what kind of technologies and equipment you require.

--Leon Furth (National Security Advisor for the Vice President)

To build a credible set of options for future force structuring and modernization, a methodical method is needed to ensure consistent logic. The new model should be based on integration--integration across missions, integration across MAJCOMs, integration across related processes, and integration across timelines. The first step, an assessment of near-term environmental factors, is necessary to determine current force needs to continue to meet daily CINC requirements, and then an assessment of long-term environmental factors is needed to frame our vision for future operations. It is against these environments that "capability assessments" would be conducted. Assessments would include a comparison of needs that are responsive to today's CINC priorities, as well as the needs of the 2020 EAF. Figure 8 presents a notional set of six capability areas that could be assessed at this point (Support the Forces, Move Forces, Provide Information, Control Battlespace, Command the Forces, Engage Targets) with their related functional tasks.

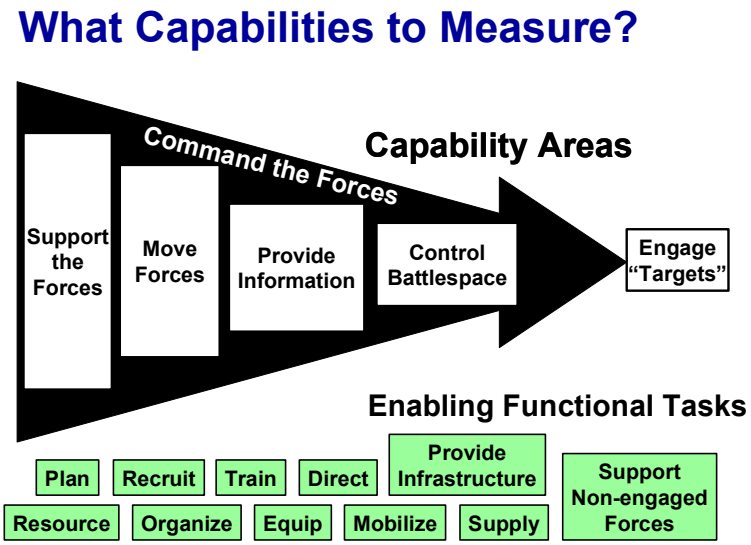

Figure 8. Capability Areas and their Enabling Functional Tasks

Figure 9 provides another look at some notional factors the area assessments would have to consider for each capability area.

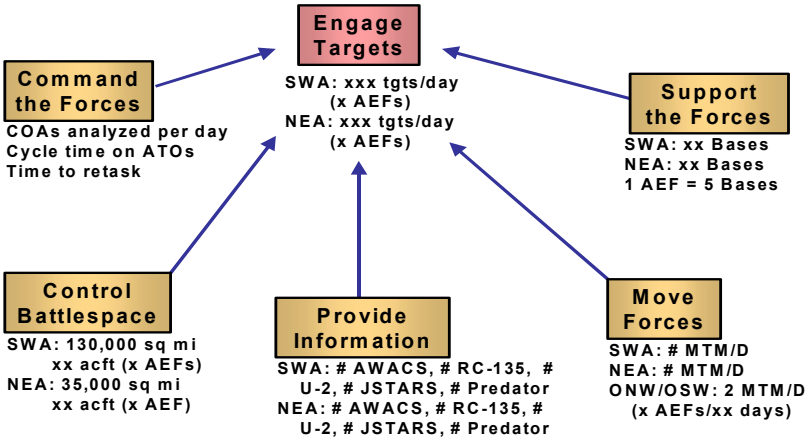

Figure 9. Considerations for Capability Area Assessments

From these assessments would flow a set of prioritized capability objectives. These objectives would first identify specific targets for improving current forces to meet real-time operational CINC requirements. In addition, they would address longer-term needs

to grow capabilities to meet future projected threats and demands. The combination of near-term and long-term needs would define a capability objective that provides definite, quantifiable guidance for investment and capability tradeoffs (see figure 10).

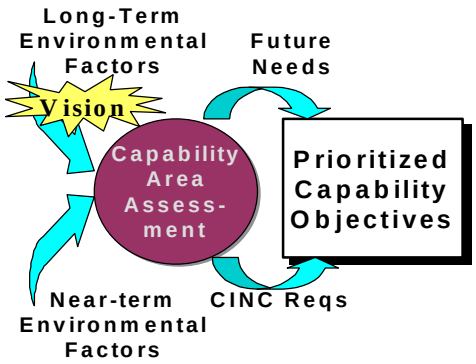

Figure 10. Prioritized Capability Objectives Based on Future Needs and Current CINC Requirements

A number of these competing modernization options and current force structure demands would compose an aerospace trade-space, breaking through the usual MAJCOM stovepipes, that would allow tradeoffs across all AF missions. Integrated assessments across the tradespace that consider military utility, cost, schedule, and risk would provide critical insights on AF priorities. This activity would lead to an investment strategy that identifies specific prioritized capabilities to guide modernization efforts. This investment strategy, along with the details of the capability objectives, would also provide guidance for the generation of formal requirements. The investment strategy would also include cost-constrained options and cost-benefit analyses that demonstrate the value of different paths. Additionally, since we don't live in a perfect world, the strategy could anticipate what-if scenarios, driven by outside actors such as Congress,

changing threats, technology innovations (RMA), and the performance of current programs/systems (see figure 11).

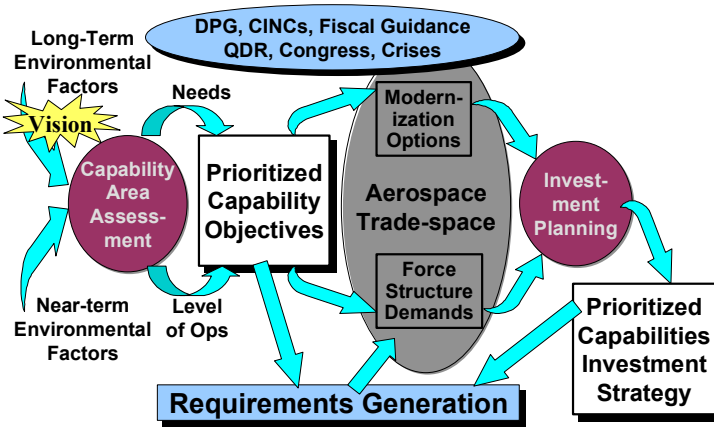

Figure 11. A New Air Force Integrated Investment Planning Model

One of the criticisms of the current Air Force modernization process is the tendency to focus only on the end-state with little attention on how to make the tough choices in the near and mid-term to reach those end-states, i.e., once a program begins, it is rarely canceled, even though the initial assumptions and capabilities required have changed, sometimes dramatically. This new model would marry the near, mid, and long-range plans over a 20-year roadmap--showing how current needs are met, which future capabilities will be achieved and when, and what sacrifices (e.g., divestiture) and risks should be accepted to fulfill the needs of the CINCs and joint force commanders.

In order to execute such a robust integration effort, greater participation by the Headquarters Air Force (HAF), especially in the initial stages, is required. MAJCOMs will continue to provide the detailed insights on operational impacts, unit performance, and system capabilities, however, the HAF must now first provide the common framework and overarching guidance that drives the MAJCOMs mission area plans and

budget formulation. The HAF must now also facilitate up front cross-MAJCOM dialogue and help make those tough calls for new investment priorities and divestiture, as well as resolving cross-cutting issues between MAJCOMs. In the end, increased HAF involvement will foster insights on future strategies, overall operational capabilities, needs, and technologies early in the process, prior to submission of MAJCOM Program Objective Memorandum (POM) inputs. This should significantly improve the corporate review process after POM submission, by providing a view of the total Air Force program that has already been thoroughly reviewed and integrated prior to the formal programming and budgeting phases. Figure 12 depicts the proposed process. As shown, the Prioritized Capabilities Investment Strategy is now a new, major input to the start of the formal programming phase.

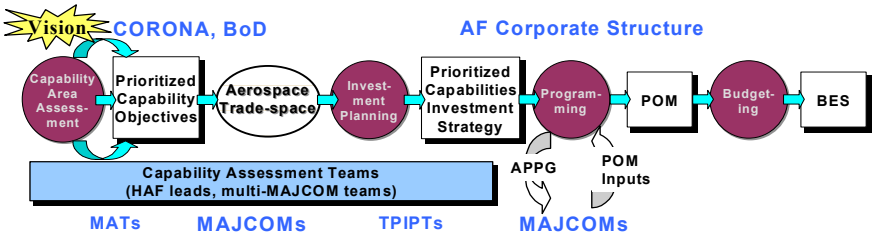

Figure 12. New Investment Model Input to Existing Programming and Budgeting Cycles

The Task Force also proposed that appropriate corporate reviews could consist of the AF Board of Directors or CORONA meetings for assessing and approving capability objectives before formally documenting them in the AF Strategic Plan. In addition, the AF Corporate Structure (Panels, Group, Board, and Council) could now perform an early review the Investment Strategy, providing important guidance before beginning the formal programming activities of PPBS. Reviews of the investment strategy and the POM would be continually compared to the capability objectives, with formal tracking of the connection between programs and requirements conducted through Capability Area Program Reviews (CAPRs). Guiding the development of the integrated investment strategy elements would be Capability Assessment Teams, each HAF-led with MAJCOM participation. Thus, MAJCOM MAP activities (e.g., MATs, TPIPTs) would still be required, but conducted under a common planning framework led by the HAF with senior leadership guidance (see figure 13).

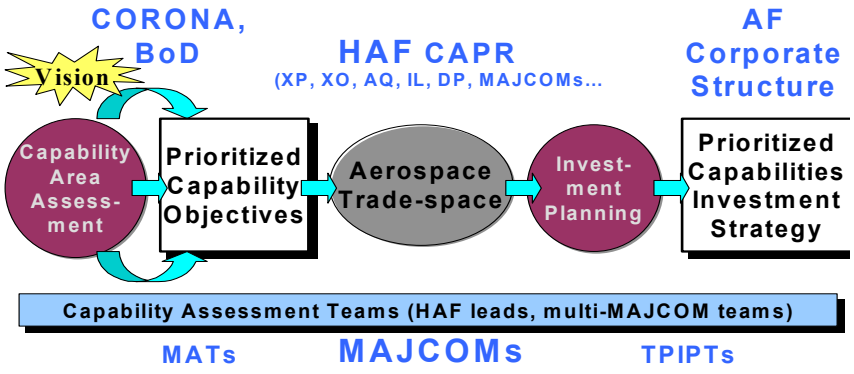

Figure 13. Corporate and MAJCOM Participation in the New Process

One of the greatest frustrations of the current PPBS cycle, especially in the latter stages of the programming/budgeting phases, is the difficulty senior leaders have in making worthwhile cost-benefit tradeoffs amongst a vast assortment of varied programs, while under the gun of tight deadlines and overstressed budgets. By including periodic reviews at each step of the new process as an integrated investment picture is developed, senior leadership should be much better equipped to make the tough choices on overall Air Force investment strategy. This new model provides a methodical method to ensure consistent logic and valid data is applied to help build a credible set of options for force structure and modernization. It is based on a capabilities focus, early and continued integration across all mission areas, and up front, capability-based direction from AF senior leadership. The culture change to implement this process will not be easy, but it is absolutely required. The current force structure is not optimized to meet current needs or future challenges, and the growing mismatch between requirements and resources paints a grim picture of the problem getting worse before it gets better, unless changes are made soon.

Next, we'll move from process to product--what kind of future force structure options could this process conceivably produce and what are the tradeoffs required to make them a reality?

Chapter 8

A Look At the Future

I never think of the future; it comes soon enough.

--Albert Einstein

Although recently praised as "Man of the Century," Albert Einstein would probably not make a good Air Force planner, since a clearly articulated view of the future is critical for strategic planning.

First, let's assume the Task Force's new investment planning model works and it lets our senior leadership make the right choices and build a balanced, efficient, and truly capable aerospace force for the 21st century. What will that aerospace force look like? Do we foresee appropriated budgets that will fund such a force, or should we expect flat budget toplines? What are the tough tradeoffs we'll have to make to remain within the budget and still meet our vision for 2020? What are some of the force structure options we have, given our known deficiencies today and projection of the future threat? All good questions that deserve further study.

First, let's take a look at some of our known key near-term deficiencies, based on inputs from CINCs, MAJCOM MAPs, Kosovo Lessons Learned reports, etc., lined up against the new proposed Capability Areas (see figure 14).

Capability Area	Deficiency	
Engage Targets	Killing Mobile Targets Killing Targets in Weather Increasing Stand-off Range	Quantity of Precision Tgts Feeding Isolated "Friendlies"
Control Battlespace	Protecting the Force Defending from Missiles	Increasing Self-Protection Space Control
Provide Information	Finding Mobile Targets Exploiting RF Spectrum Detecting LCS Targets Communicating Beyond LOS	Finding Concealed Targets Assuring Target Recognition Making Precision Landings Sustained ISR Ops
Move Forces	Achieving Rapid Closure	Refueling Capacity
Support the Forces	Providing Spares Accessing Bandwidth	Increasing Training Thruput RTOC Improvements
Command the Forces	Retasking Dynamically Providing Common Operating Picture	Projecting COA and Consequences Assessing Effectiveness

Sources: MAJCOM MAPs, CINC IPLs, Kosovo Lessons Learned, JEFX, Wargames

Figure 14. Key Near-Term Deficiencies

In addition to these specific operational deficiencies, one must not forget the continual pressures put on the AF budget by:

Personnel Tempo	Operations Tempo
Retention	O&M Costs
Budget Toplines	Average Fleet Age
Acquisition Cycle Time	Life Cycle Costs
Etc.	

Considering these near-term problems with a vision for the future, what should be the priorities and strategic direction for a 2020 Aerospace Force? The Task Force built a simple model (see figure 15) that lays out four possible broad themes for a future aerospace force, with each theme driving key investment decisions that need to be made now.

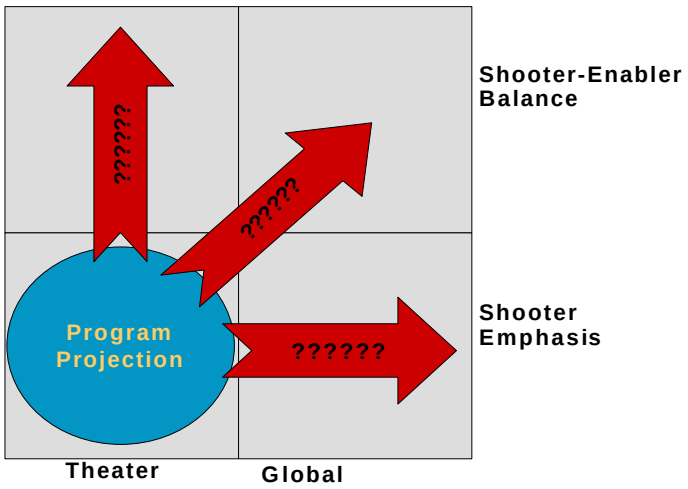

Figure 15. Broad Themes for the Future of the Aerospace Force

The lower left box represents the status quo—the current program projection--where we will end up if we carry on with the current decisions we have on the books now. It will also be referred to as the 2020 Baseline Force, and represents primarily a theater-shooter emphasis (to be explained shortly). The other three boxes represent changes in direction, based on a force structure rebalance of weapon systems capabilities (shooter vs. enabler) and dimensions of power projection (theater vs. global). A shooter emphasis would favor a continuing force structure of fighters, bombers, future space strike platforms, etc. An enabler emphasis would favor the supporting assets, currently in short supply and overused, such as airlift, battle management (BM), Intelligence/Surveillance/Reconnaissance (ISR) platforms, etc. For a simple portrayal of this shooter-enabler imbalance, in this case in terms of personnel tempo, refer to figure 16.

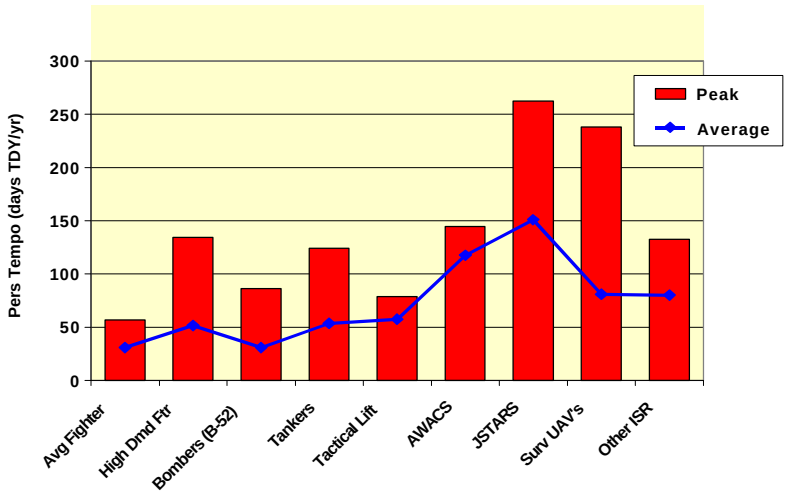

Figure 16. Shooter-Enabler Imbalance

Depicted here is the average number of deployed days personnel in each of the weapons systems shown, served annually during the period 1995-1999. With shooters primarily on the left side of the graph and enablers on the right, the imbalance between the two becomes clear—not enough enabling systems is driving the current force we have to unacceptable levels of overuse.

For power projection (theater vs. global), a theater emphasis would continue with a "projection of forces" type strategy, using bases located far forward in the theater of operations. Obviously, circumstances such as access denial to forward bases, due to political or enemy attack considerations for example, could undercut this kind of approach. In light of that, do we want to reorient our force structure more towards a global capability, that requires deep, sustained, long-range strikes from our own CONUS or friendly allied bases?

Given these definitions of possible new strategic directions, what are some of the modernization options possible for the USAF, and what are the broad implications for cost, resources required, ability to carry out the national security strategy, OPSTEMPO, PERSTEMPO, infrastructure, training, equipment age, etc? In addition, how do the options change under a fixed topline budget or a projection of increased toplines?

Chapter 9

New Directions for the Air Force

There is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things.

--Nicolo Machiavelli

In this section, we'll take a look at a few of the Task Force proposed modernization and force structure changes based on the broad themes discussed in the last chapter. As you will see, credit should be given right up front to the Task Force for an outstanding effort that breaks through many of the stovepipes and parochial biases that prevented such an integrated and honest assessment in the past. Basing their approach on a comprehensive assessment that leads naturally to prioritized capability objectives, the team built future force options from a top-down view of where we want the 2020 aerospace force to be (as opposed to the historical, MAJCOM-driven approach of changes on the margin at the corporate level, driven primarily by the virtually untouchable allocations of MAJCOM budgets, with little regard for an overall AF strategic vision or integration between major mission areas). Figure 17 presents the six most likely options for reprioritizing the direction of current Air Force modernization efforts, that could flow out of the new investment model. In addition, the 2020 Baseline Force (Option 1) is presented for comparison.

Stay the Course

Option 1: 2020 Baseline

Adjust Priorities

Option 2A: Balance Within Fixed Top Line

Option 2B: Balance With Increased Top Line

Transition

Option 3A: Long-Range EAF/Standoff Warfare

Option 3B: Joint Support Force

Recapitalize

Option 4A: Recapitalize Within Fixed Top Line

Option 4B: Recapitalize With Increased Top Line

Figure 17. Possible Options for Reprioritizing Modernization Efforts

Option 2 balances the current force by adjusting priorities and placing less emphasis on shooters (fighters, bombers) and more emphasis on enablers (lift, BM/ISR). Munitions, although categorized with the shooters, really acts like an enabler, as will be shown in subsequent discussions. The balance is produced under two different resource assumptions. First, a fixed topline projected budget is assumed, so funding the buildup in enablers is done by cutting or reducing the shooter force (Option 2A). The second variant under this option assumes increased funding for enablers through an increase in the Air Force budget (Option 2B). Option 3 presents a transition plan that takes the Air Force in a couple of new directions. Option 3A represents a transition to a long-range standoff force, emphasizing global power projection. Option 3B assumes the USAF provides primarily an "air service" to the other services; acting in a support role for joint operations. Option 4 addresses the serious problem of the aging fleet and attempts to

recapitalize the force with newer equipment. In addition, as in Option 2, two variants based on a fixed budget and an increased topline, are presented.

Option 1: 2020 Baseline Force

First, let's take a look at the 2020 baseline force, which will be used for comparison for all options presented, and some of the assumptions used to generate it (see figure 18).

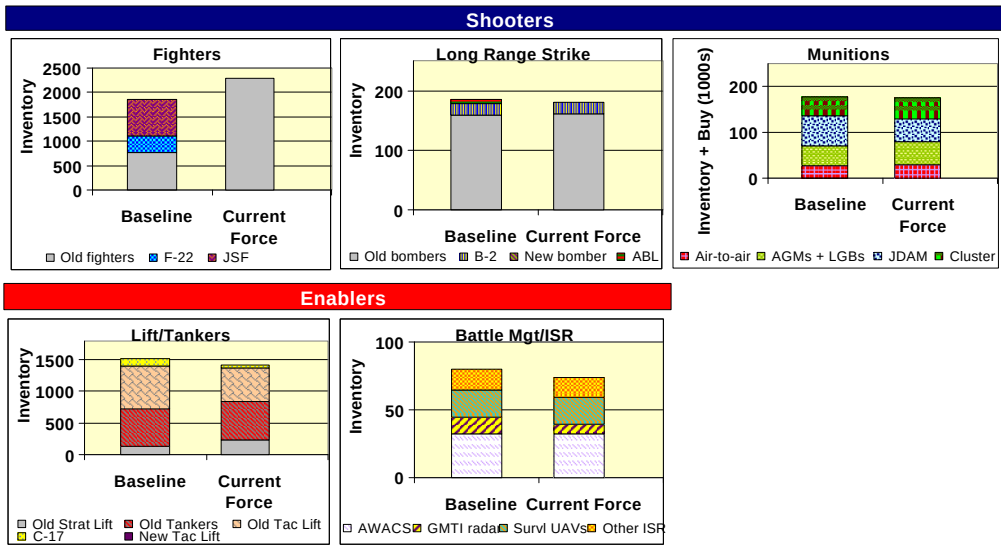

Figure 18. Option 1: 2020 Baseline Force Compared to Current Force

2020 was chosen as the end-year for the baseline and all other options because it provides an adequate timeframe to consider new systems that are not currently represented in funded programs. The baseline force was derived from the current Air Force Program Projection (AFPP), since it extends out to 2017 and it is a corporately approved document that provides the most accurate existing position for comparison and departure. The AFPP, however, optimistically assumes a 1.5% annual real growth rate in

the Air Force modernization budget. The 2020 baseline force presented here, on the other hand, is a fiscally constrained (and more realistic) variant of the AFPP, and assumes Air Force modernization budget levels will remain at current levels, i.e., 0% real growth through 2020. The decrease in funding presented by this conservative approach would be accounted for primarily through a smaller fighter force—1193 F-16s would be replaced with 762 JSFs. The lift force would also be slightly smaller, reflecting in part, less lift required to support smaller fighter deployments. The rest of the force structure is essentially the same as the current AFPP.

The overarching problem of resources not matching requirements, both today and in the future, has already been discussed in general terms. A few more specific deficiencies now become evident with the 2020 Baseline Force:

1. The high use rate of Precision Guided Munitions (PGM) in Kosovo, due to political and other constraints, exacerbated an already short supply—estimated on the order of 20% short and growing shorter at current deployment rates.

2. The aging of the fleet, even with current modernization efforts (F-22, JSF, C-17, etc.), continues to worsen through 2020. Previous assumptions on the costs to support an aging fleet assumed a flat growth rate in maintenance costs—however, recent studies based on fleet data show the costs to actually increase exponentially with age.[1] General Krulak, facing similar problems in the Marine Corps testified: "Even within our O&M accounts themselves, money which would normally be dedicated to training and training support functions is currently being spent to maintain this aging equipment. It is a vicious cycle, and one that becomes increasingly expensive to stop with time. As the commercial says, 'You can pay me

now, or you can pay me later.'"[2] Average ages for Air Force aircraft in 2020, by mission area, include:

Fighters – 19 years
Bombers – 42 years
Airlift – 29 years
Tankers – 55 years
ICBMs – 44 years
BM/ISR – 31 years

In every case, this is well above nominal service lives and historical trends.

3. The Baseline Force sets priorities on shooter modernization—60% of the fighter force will be modernized through the acquisition of F-22 and JSF. A smaller, less lift-dependent fighter force (F-22 and JSF require 1/3 as much lift as current fighters) would increase substantially how many could deploy in the first 20 days of a Major Theater War (MTW) scenario, but still misses the requirement by about 35%.

4. As confirmed during recent contingencies, 13 Joint Stars aircraft will be inadequate for MTW scenarios.

5. As stated earlier, the Baseline Force reduces the fighter force by 20%, thus reducing both the size and flexibility of response options.

6. Long range, stand-off strike platforms are limited. The Baseline Force continues to rely on theater versus global attack power projection, making it particularly vulnerable to enemies practicing anti-access and asymmetric strategies.

7. Absent a reduction in demand for Air Force High Demand/Low Density (HD/LD) assets (e.g., AWACs, U2, Rivet Joint), which doesn't seem likely based on usage

rates in recent contingencies, the Baseline Force modernization plans will not alleviate the shortages by 2020.

8. Imbalance between enablers and shooters continues, with BM/ISR assets averaging twice the PERSTEMPO of fighters/bombers. Overall, current and projected BM/ISR, mobility, and munitions levels are not capable of fully supporting fighter and bomber delivery platforms.

In general, staying this course may not be sufficient to meet future CINC demands for aerospace power. During the last decade, aerospace power has become the force of choice to deal with a wide range of contingency operations. As a result, operational demands have increased OPSTEMPO and PERSTEMPO close to the breaking point. This will be alleviated somewhat with the transition to an AEF structure, but will likely remain a serious problem for most of the enablers, especially HD/LD assets. From a modernization perspective, the baseline force will also result in a more rapidly aging fleet and accelerate the timeline for replacements at current usage rates.

Option 2: Balanced Force

The first excursion from the baseline proposes changes to rebalance the force between shooters and enablers (see figure 19).

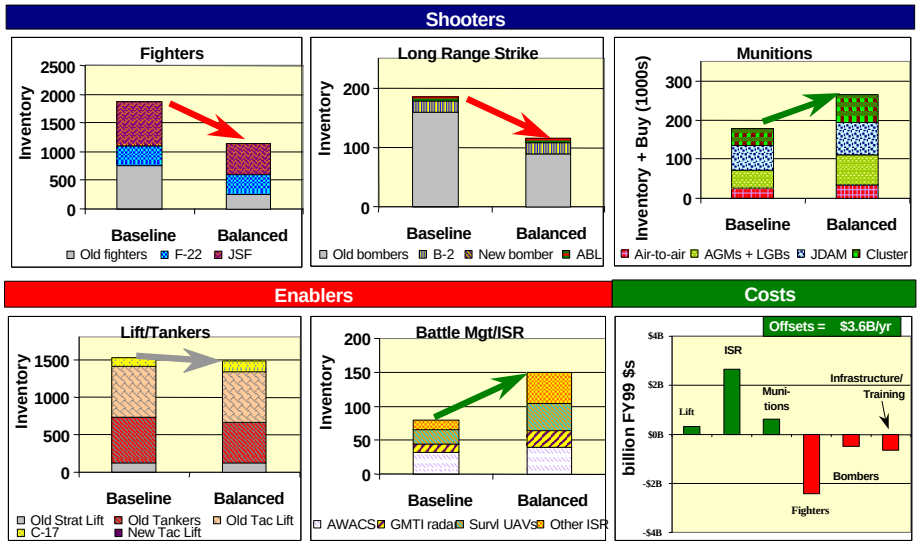

Figure 19. Option 2A: Balanced Force with Fixed Topline

A fully supported shooter force will become much more effective by increasing the accuracy of each shot through better BM/ISR support and smart munitions. This balance will also help solve PERSTEMPO issues for current HD/LD assets. As shown in the bottom right graph above, this option under a fixed budget is paid for primarily through fighter and bomber force structure cuts and modernization reductions, as well as the corresponding reductions in infrastructure/training. Under this plan, fighter inventories decrease by 38%, while BM/ISR inventories increase by 49%. Also of note:

1. Ground Moving Target Indicator (GMTI) capability is provided with a combination of JSTARS aircraft and space-based GMTI radar (assumes a successful outcome of the Discover II development program and follow-on engineering and production programs). As space-based radar assets are deployed, JSTARS aircraft are phased out. Basing GMTI radars in space would have strong advantages in

global coverage capability and timely response, and would be less susceptible to terrain masking.

2. Munitions increases cover the current 20% deficit of the baseline force and are funded at a level necessary to meet MTW requirements plus those estimated for SSCs.

3. Some additional C-17s are added as older systems phase out, but overall lift/refueling inventories decrease slightly since a smaller fighter and bomber force requires less lift and tanker support.

4. The fighter force average age improves significantly from 19 to 13 years as older systems in the baseline force are phased out. BM/ISR average age also decreases from 31 to 19 years. Average age of the rest of the platforms remains well above nominal service lives.

5. This option provides only limited stand-off global power projection.

6. Responsiveness improves—with a less lift-intensive modern fighter force, the number of fighters that can respond in the first 20 critical days increases. However, due to the fewer number of tails available, flexibility decreases and risk in MTW operations increases.

The next excursion under the same option, assumes the force balance will be paid for with increased funding levels, on the order of $7.1B annually as shown on figure 20.

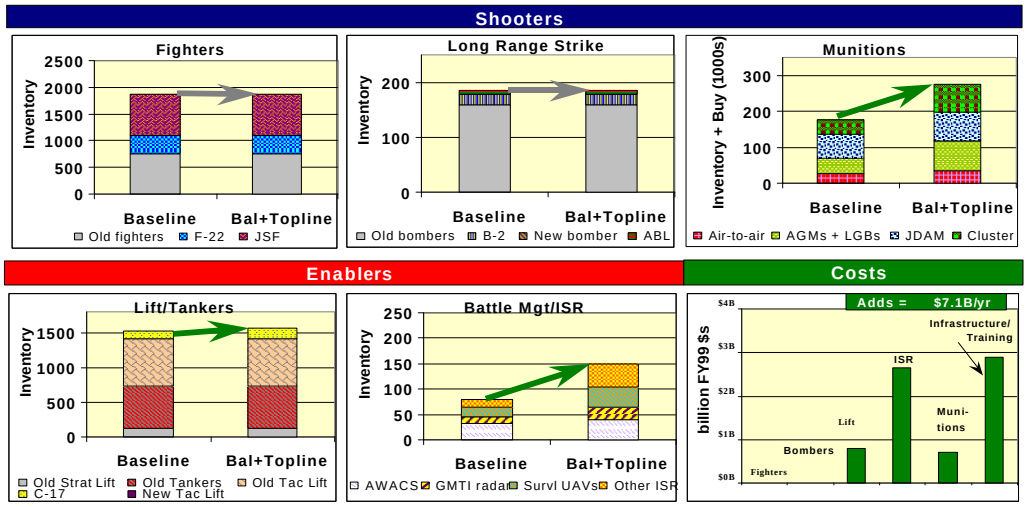

Figure 20. Option 2B: Balanced Force with Increased Top Line Budget

Obviously, this funded option eases many of the tough tradeoffs and inherent risks present in the previous option with a fixed topline. This excursion preserves the shooter force structure at the levels of the baseline force and more appropriately represents an aerospace force matched to our current strategy, i.e., able to respond adequately to MTW scenarios as well as SSC operations. This required response capability is one that will likely continue in its basic foundations absent a radical turn in the global security environment. This option does provide some relief for BM/ISR fleet aging, but the rest of the inventory remains at unacceptable levels. Also, by modernizing fighters and not bombers, this option perpetuates the theater focus at the expense of global power projection.

Option 3: Transition Forces

The next alternative (see figure 21) presents a significant departure from the 2020 baseline force.

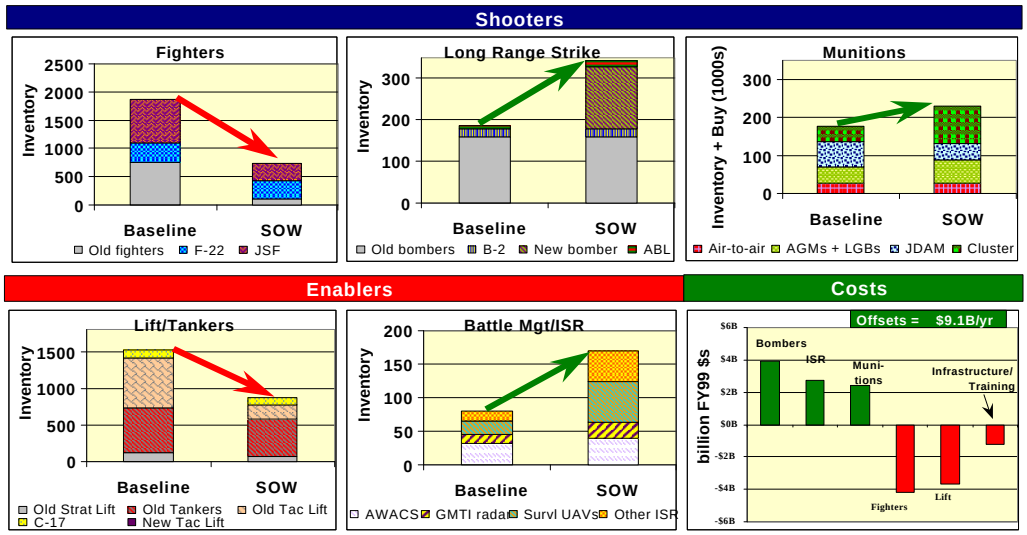

Figure 21. Option 3A: Long Range/Standoff Warfare with Fixed Top Line

While the current Air Force vision clearly addresses our desire to become a global force, reality suggests that our baseline focus remains theater oriented. In a seminal 1996 speech, General Ronald Fogleman, then AF Chief of Staff, observed that the United States was "on the verge of introducing a new American way of war."[3] This new approach to warfare was based on the emergence of modern weapon systems with extended range and increased lethality, as well as new means of surveillance, assessment, and battle management.

Aside from providing some more balance on the enabler side as Option 2 did, this option also acquires 150 new, long-range strike aircraft. Technology and proliferation

trends indicate that an adversary with a robust anti-access capability will become an increasingly more likely future foe to a theater-oriented force. If the future Air Force wants to meet this challenge, it must consider efforts to achieve a capability responsive to asymmetric access denial strategies. Funding for strike aircraft is found primarily through steep reductions in the fighter and corresponding lift force. In addition, the new strike aircraft would provide a standoff capability, so the corresponding development and acquisition of standoff weapons (SOW) and target-quality, deep-look ISR would be required, as shown. This type of force would rely on information dominance and net-centered warfare where the aircraft ferry the long-range stand-off weapons to launch points and depend upon the net to guide them to their targets. Also of note:

1. Aircraft aging improves significantly for the fighter, bomber, and BM/ISR inventories.

2. As in option 2, surveillance and tracking of mobile ground targets is accomplished primarily with a space-based radar in lieu of JSTARS.

3. Response and flexibility in anti-access scenarios (forward base denial) increases, and deployment capability to forward theaters decreases. The fundamental trade is to increase global power projection at the expense of theater power projection.

4. Space-based strike assets would also be compatible with this option, but are unlikely to be available by 2020.

The next excursion under this option, which will be discussed briefly, is a Joint Support Force—designed to respond primarily to a potential Army need for added airlift to support emerging Army After Next concepts. Given more recent alternatives surfaced by the Army Chief of Staff, this option may prove to be moot until the final Army force

structure deliberations are complete and lift requirements are determined. Nonetheless, it is presented here as food for thought (see figure 22).

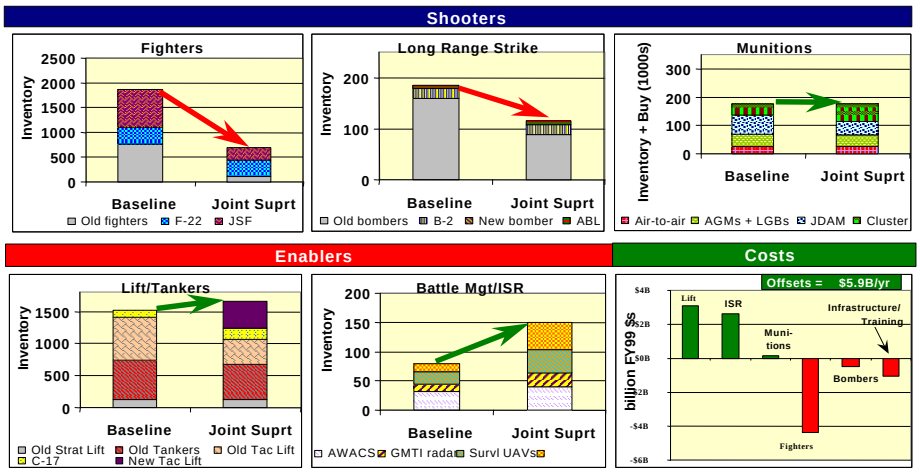

Figure 22. Option 3B: Joint Support Force with Fixed Top Line

As shown, the increase in tactical airlift required to transport the Army's air-deployable forces would be funded through shooter cuts. An obvious outcome of this option would be a significant decrease in the Air Force's ability to respond to both MTW and SSC scenarios. Accordingly, another obvious undesirable outcome is the possibility that an earlier arriving and more robust Army ground force could face a much stronger threat of enemy air attack. Jeffrey Cooper also argues against this concept, stating: ". . .the traditional roles of ground and air power are reversed—making ground the supporting element and air the now decisive force."[4] Richard Hallion agrees: "Air power has evolved beyond being a supporting arm of the surface forces . . ."[5] Yet, despite the case against this "joint air service" proposal, the Air Force may be its own worst enemy: "Yet, in its basic doctrine, the Air Force seems content to accept a minor

or supporting role for airpower in countering the enemy's operations on land and sea."[6] If pursued, this joint enabling force would result in a greatly altered force structure incompatible with other Air Force objectives.

Option 4: Recapitalize

Option 4 focuses on the growing problems of inventory aging by replacing the majority of the older platforms. Given the increasing requirement to respond to numerous SSCs and the additional wear and tear it imposes on the fleet, it is likely the service lives of the current force structure will continue to shorten. One option then is to focus on recapitalization.

Extensive and significant aging of the force took place in the 1990s and is expected to continue with the baseline force well into the 21st century. In the history of the Air Force, the breadth and depth of this current fleet aging predicament is unprecedented. For example, the average age of all Air Force aircraft, active and reserve, in 2000 is 20 years, up from 13 years in 1990. The average age will rise to 28 years in 2010 and 30 years in 2020 under the current modernization plan, assuming optimistically that baseline procurement plans will be fully funded.[7] This is well above the steady state average age of 15 years that was projected for the QDR force.[8] This increase in average age is even more telling given that aircraft inventory levels decreased from 8959 in 1990 to 6228 in 1998, by mothballing or retiring the oldest aircraft.[9] The implications of equipment aging are not easy to quantify, but they are expected to be significant. Two senior Air Force acquisition officials testified before the Subcommittee on Military Procurement of the House Armed Services Committee in February 1999: "While it is difficult to quantify the exact impact aging has on Air Force readiness, we are confident it has significantly

contributed to the declining mission-capability rates and increasing Operations and Support costs. This alone is cause for concern over implications of maintaining fleets for longer and longer periods of time."[10]

The first excursion, option 4A, recapitalizes within a fixed top line budget (see figure 23).

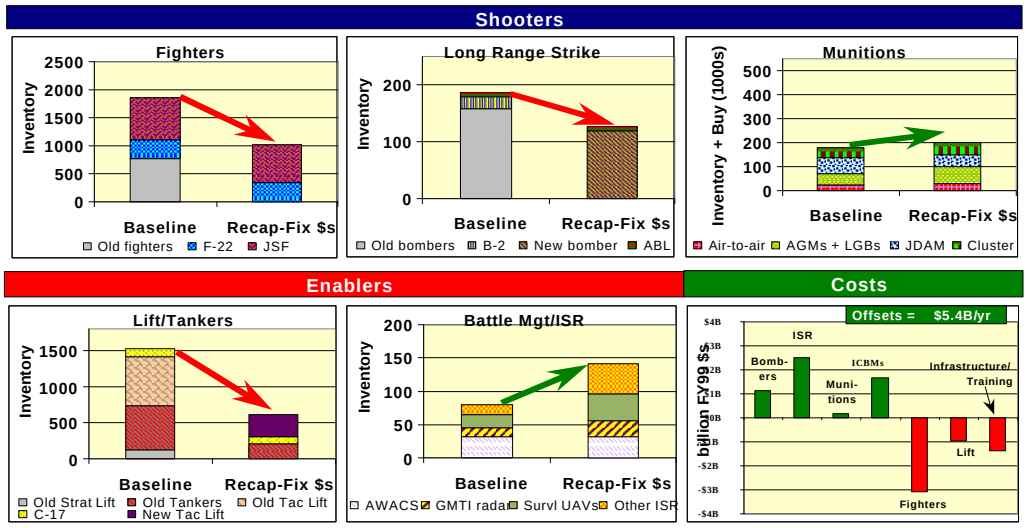

Figure 23. Option 4A: Recapitalization within Fixed Top Line Budget

By 2020, it modernizes the fighter and long-range strike force, and replaces older tactical airlift platforms with modern tactical lift. Although not shown, the ICBM legacy force is also replaced with a new system. Funding is provided by retiring the older fighter, bomber, and lift systems along with a corresponding cut in infrastructure and training. The fundamental trade here is quantity for quality—full recapitalization will result in a smaller, but younger, force. Force aging is largely arrested (Average ages in 2020: fighter-8 yrs, bombers-5 yrs, BM/ISR-20 yrs, strategic lift-18 yrs, tactical lift-3

yrs, ICBMs-3 yrs), with the exception of tankers (average age-35 yrs), since this would have driven the bill to extremes. Accordingly, tanker aging problems remain an issue with this option. Also of note, as previously discussed under option 3, 150 new stand-off strike platforms acquired with this option provide an enhanced global strike capability. Unfortunately, given current SSC demands, the smaller inventories associated with this option would increase PERSTEMPO to unacceptably high levels across many more platforms. In addition, the resultant smaller inventory would effect the ability to respond effectively to MTWs.

Finally, Option 4B similarly recapitalizes the force, but assumes budget plus-ups on the order of $12B/year to fund it (see figure 24).

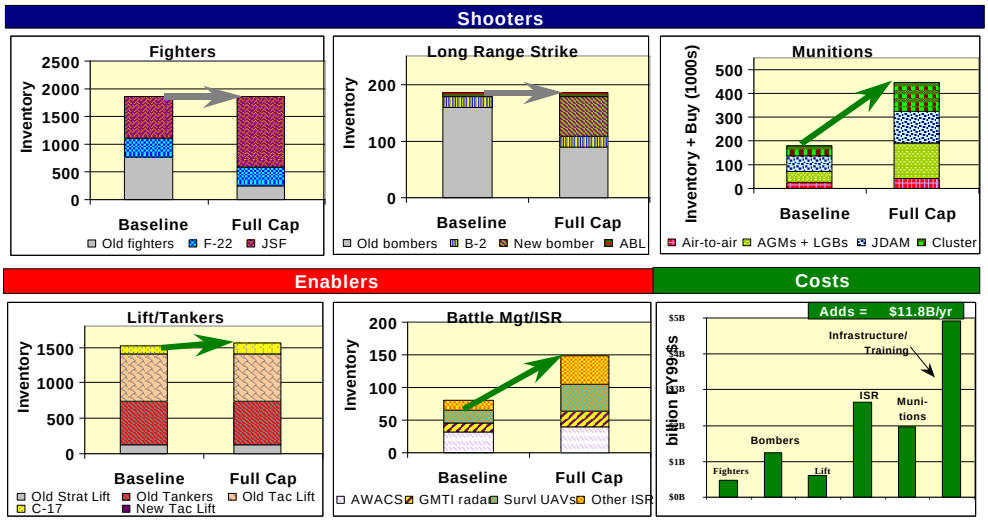

Figure 24. Option 4B: Recapitalized Force with Increased Top Line

Like option 2B, this fully funded option reduces the number of difficult choices required under a fixed budget. Given the likely increased requirements for aerospace

power, it is not unreasonable to make a case for increased budget authority, in reality however, requesting increased service budget levels is always an uphill, parochial battle. Of note, $5B of the proposed annual increase is for infrastructure and training, including $1.7B additional needed for technical training and $1.6B for depots/logistics. Costs in those areas traditionally grow when new, more sophisticated equipment replaces legacy systems—however, overall life cycle costs are significantly reduced since mandatory Life Cycle Cost improvements are designed into modern weapon systems. The training costs are critical, especially in light of a recent Senate Report: "Given the inadequate material support and the diminished time routinely available to give pilots complete combat-ready skills, we are producing a combat pilot cohort that, while not second-rate, compares poorly to what the Navy and Air Force have produced in the past."[11]

Overall, this option provides: full-scale modernization for fighters, bombers, and strategic airlift; balanced enablers; and retains the force structure for complete capability across the full spectrum of operations, both in-theater and globally. In addition, all required Air Expeditionary Forces for an MTW could deploy within 20 days from a cold start. Once again, however, in order to keep the total bill reasonable, tankers are not replaced under this option, but could be at additional expense.

Key Insights on the Options:

1. The 2020 Baseline Force is unbalanced, lacking sufficient munitions, lift, and BM/ISR assets to effectively carry out the current national security strategy. In effect, the 2020 Air Force with the current programs on the books, looks much like the Air Force of today.

2. The Baseline Force is theater focused, when anti-access strategies may require long range, standoff capabilities.

3. Force balance, to respond across the full spectrum of MTW and SSC scenarios, can be achieved at the expense of fighter/bomber force structure or an increase in Air Force top line budget.

4. In general, trading legacy systems for new acquisitions is very costly in terms of dollars gained (O&M savings only) and capability lost. Topline increase is much more effective in terms of directly yielding forces, but of course, politically challenging.

Notes

[1] Raymond Pyles, "Statement before the House Armed Services Committee Subcommittee on Military Procurement, Hearing on Aging Military Equipment," 24 Feb 99.

[2] Gen Charles C. Krulak, "Statement of General Charles C. Krulak before the Senate Armed Services Committee," 1998, 3-4.

[3] Gen Ronald R. Fogleman, "Airpower and the American Way of War," speech presented to the Air Force Association's Air Warfare Symposium, Orlando, Florida, 15 Feb 96.

[4] Daniel Goure and Christopher M. Szara, *Air and Space Power in the New Millennium* (Washington DC: CSIS , 1997), 49-50.

[5] Ibid., 90.

[6] Glenn A. Kent and David A. Ochmanek, *Defining the Role of Airpower in Joint Missions* (Washington DC: RAND, 1998), 4.

[7] Gen Michael Ryan, "Letter to Senator John McCain," 25 Sep 98.

[8] Goure and Ranney, *Averting the Defense Train Wreck*, 31.

[9] "Air Force Almanac," *Air Force Magazine* 74, No. 5 (May 1991): 52-54; and "Air Force Almanac," *Air Force Magazine* 82, No. 5 (May 1999): 64-66.

[10] Lt Gen John Handy and Lt Gen Gregory S. Martin, "Statement Before the House Armed Services Committee Subcommittee on Military Procurement, Hearing on Aging Military Equipment," 24 Feb 99.

[11] Rowan Scarborough, "Record Deployments Take Toll on Military," *Washington Times*, 28 Mar 00, 6.

Chapter 10

Tying It All Together

Obviously, there are an infinite number of combinations of the force structure options shown, but the ones discussed here encompass the most likely end states the current aerospace force could evolve to. Given the four broad options discussed above, let's go back and take another look at the program projection graphic shown earlier. If we were to plot all of the options discussed in their appropriate quadrant, the layout would look something like figure 25.

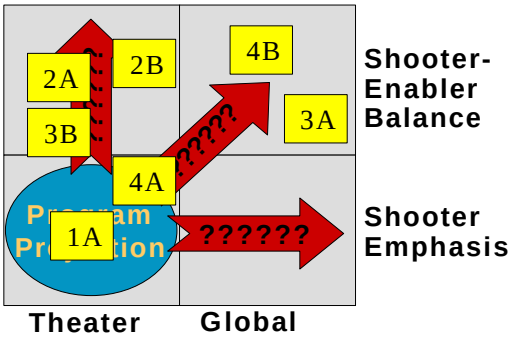

Figure 25. Modernization Options Plotted Against Broad Themes For Future Direction

A fully effective aerospace force for 2020 would have to respond across the full spectrum of operations, with a balance of both combat (shooter) and combat support (enabler) forces. Three of the options stand out on the graphic as coming closest to the future force we'd like to see. Option 2B (balanced force with increased top line) obtains a well-balanced force, but provides limited global presence. Option 3A (Long-range force within fixed top line) also achieves some balance, but provides it only in a global sense at the expense of in-theater strength. Option 4B (recapitalize with increased topline), on the other hand, provides long range, global strike capabilities with adequate residual theater presence and balances the shooters and enablers. The problem with 4B, of course, is the price tag--an adequate recapitalization of the force could cost up to $12 billion additional each year. Given the unpredictability of politics and an annual, Congressionally-approved appropriation process, counting on a plus-up of this magnitude, in competition with the other services, may be risky, to say the least. Nonetheless, the Air Force Board of Directors chose Option 4B as the leading candidate to pursue. As another option, a flexible game plan that pursues an eventual outcome in the approximate square bounded by 4A, 2B, 4B, and 3A would be prudent and a significant improvement over the present situation. With option 4B as the ideal goal, any future force that ends up in the top, right quadrant would be a noteworthy improvement to the current baseline force. In conclusion, this new model for modernization and force structure prioritization provides the first real attempt to tie an Air Force vision, based on capability objectives, to an aerospace modernization plan. That, in itself, should provide some appeal to OSD and Congress and improve the Air Force's chances significantly for future budget increases.

Figure 26 recaps the total, improved process from vision to acquisition of weapon systems. The new front end planning block provides the real payoff for this model.

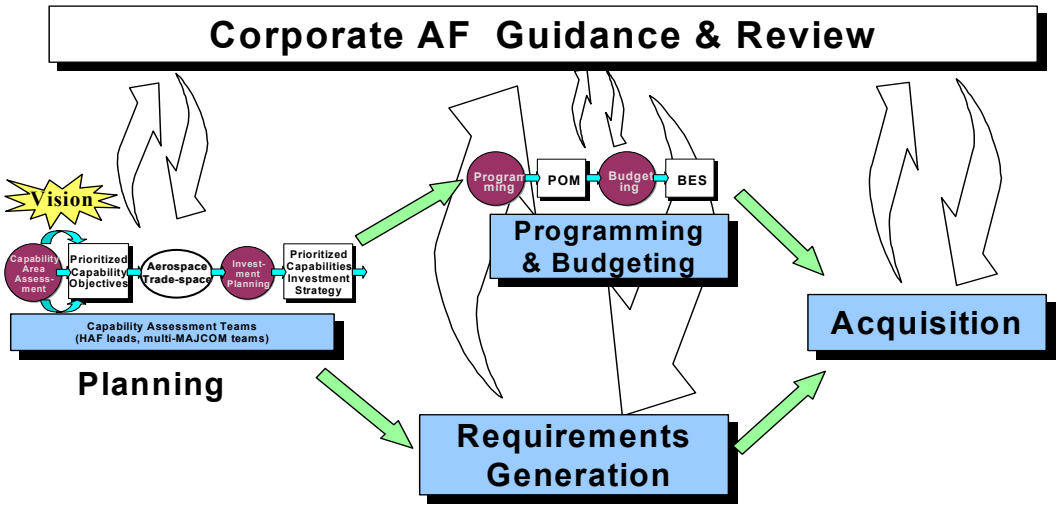

Figure 26. Total New Process From Vision to Acquisition

Now that we see it notionally on paper, what are the next steps necessary to make it a reality:

1. Initiate the capability assessment teams for each capability area (Support the Forces, Move Forces, Provide information, Control Battlespace, Command the Forces, and Engage Targets). With full HAF and MAJCOM participation, initiate focused analyses of capability objectives, develop and validate capability metrics, and start building a rough-order investment strategy.

2. Expedite parallel efforts that are currently reengineering the PPBS process. Make sure the reengineered processes and this new model are compatible. Continue to leverage current MAJCOM planning efforts.

3. Emphasize the key tenets--corporate involvement throughout, integration across mission areas, and a capabilities focus.

4. Integrate across the Capability Assessment Teams and build an Integrated Investment Strategy based on a fully recapitalized Aerospace Force (Option 4B) as the ideal goal. Should option 4B prove to be fiscally unattainable, settle for nothing less than a solution in the upper, right quadrant (global, balanced force). Use the prioritized capability objectives to guide the next QDR and justify top line budget increases.

5. Update the Air Force Vision based on new key themes and capability objectives.

Without sufficient investment in a modernized force, the Air Force is unable to step up to its current Vision. From a modernization perspective, it is imperative that Air Force senior leadership move out quickly with guidance on new strategic directions. An examination of the disparities between modernization efforts driven by current operational requirements and our desired future capabilities, underscores the need to clearly specify new modernization priorities, without delay. Time is short and the price of supremacy is not getting any cheaper.

Chapter 11

The Price of Supremacy

Either we are going to spend ourselves into extinction, or we have to come up with alternative strategies and new ways to allocate resources.

--General (ret) Edward Meyer, Former Army Chief of Staff

Discussions of future military requirements and modernization priorities lead inevitably to questions about affordability, particularly in periods of diminished danger, when the consequences of failing to modernize are less tragic. Despite the lack of formidable post-Cold War threats, the scale of U.S. defense expenditures in the 1990s is still imposing--at about one-third of the global total, it is still many times the military budget of any existing adversary. The degree of U.S. military supremacy is remarkable. Not only does the United States spend five times more on defense than any other country, it also spends its money better, producing a far more effective return on its investment than any of its major allies. Among the capabilities it possesses that most other countries do not even own are: long-range strategic transport, mobile logistics, advanced precision-guided weapons, stealth technology, and global surveillance and communications systems.[1] But while dangers to our nation are arguably at their lowest point in many years, history tells us that situation cannot be expected to last indefinitely.

A program to preserve global military supremacy needs to be fully funded, i.e., political leaders must abandon the belief that they can enjoy sustained military supremacy

for only 3 percent of gross domestic product (the approximate level prevailing today). The good news is that U.S. economic activity is so robust compared with that of current or prospective enemies, that global military supremacy can be sustained for only a modest additional increment of national wealth. Loren Thompson of the Lexington Institute proposes a 3.5 percent GDP share for the next administration[2]; Dan Goure and Jeff Ranney present a more pessimistic view of the disconnect and argue for 3.9-4.3 percent of GDP share over the next two decades to fully fund the QDR force through 2020.[3] Unfortunately, the current projection shows the DoD budget only representing 2 percent of GDP in 2020; in effect, less than half of what is required.[4]

Translating these percentages into funding levels, critics would undoubtedly complain that a defense budget increase ranging from $50 to $100 billion per year is excessive. Michael O'Hanlon presents a compelling argument for a more modest increase of just over $20 billion a year to attain the QDR force, but sees little chance of that happening.[5] Philip Gold of the Discovery Institute similarly found: "Critical munitions, modernization, readiness estimates of the annual defense budget shortfall range from $10 billion to $100 billion, with the reality probably closer to the high end. A serious, sustained air-ground campaign, let alone one (or two) major theater wars could yield a catastrophe unparalleled in American history."[6] [wash times, 27 mar] In relative terms, assuming a middle value in the $10-100 billion range, the share of national output allocated to defense would still be less than half the 7.5 percent average of the Cold War years. And because per capita GDP is so much more now than it was then, the sacrifice of the average taxpayer would be smaller still. It is important to remember that the real buying power (after inflation) of the U.S. defense budget has declined continuously since

FY86. Increasing the budget now by one-half percent of GDP would barely restore its buying power to the level it had at the beginning of the 1990s, long after the decline from the peak spending years of the Reagan administration. But this reasonable increase would still be sufficient to meet the investment requirements of continued global military supremacy.

So, supremacy is relatively affordable at a level of sacrifice that most citizens would hardly notice. In a nation that now spends 6-7 percent of GDP on various forms of gambling, it hardly seems unrealistic to expect half that amount to be spent on national defense.[7] Although military defeat at the hands of an emerging competitor might seem implausible today, human nature has not changed. If no other lesson can be learned from the deaths of 100 million human beings in conflicts during the last century, it is this: Over the long run it costs far more to be unprepared for war than it does to be well-armed and ready.

Notes

[1] O'Hanlon, 153.
[2] Loren B. Thompson, "Military Supremacy and How We Keep It," *Policy Review*, October/November 1999, 19.
[3] Goure, *Averting the Defense Train Wreck*, 11.
[4] Ibid., 12.
[5] O'Hanlon, 170.
[6] Phillip Gold, "Time to Forget the Superpower Thing," *The Washington Times*, 27 Mar 00.
[7] Thompson, 19.

Chapter 12

Conclusion

> *Perhaps the Defense Department should gin up a stadium-style banner that reads, '**World Champions - 1991, 1993**,' hang it prominently at the Pentagon, honor the achievement, and then get back to work.*
>
> --Phillip Gold, Senior Fellow at the Discover Institute

The 43rd President and 107th Congress must seriously consider some key national security decisions during their first few months in office. As summarized in this paper, immediate attention is needed first to address the growing disconnect between our national security strategy and the resources required to effectively execute it. Not only are DoD and Air Force projected budget levels too low to operate and modernize the baseline QDR force, but they are even lower than that required to build a balanced and truly capable 2020 aerospace force. These are trying times for defense planners and it is incumbent on them to do whatever it takes to support these critical choices, by providing our senior leadership with affordable and credible options for future force structures. The new modernization strategy and the acquisition programs that flow from it must serve to refocus and energize current Air Force efforts--from the laboratories to operational units--about what is needed and when, as well as how to fully leverage scarce defense resources.

Following a summary of the strategy/resources disconnect and a slight digression toward a verdict on the RMA hypothesis, an assessment of the current DoD and Air

Force planning processes was conducted to summarize the original intent of the PPBS, highlight strengths and weaknesses, and underscore the characteristics any new Air Force modernization planning process would have to operate under. Although the assessment of PPBS and the Air Force planning process indicates that continuing efforts to improve them are critical (and likely to be frustrating), its noted deficiencies in providing a structure for integrated, cost effective results demands a robust and conscientious reengineering effort. The taxpayers who make a significant investment of their hard-earned dollars for national security should expect a more significant return.

Next, a case was built for new directions in Air Force modernization. The assessment of the baseline force was troubling, not only for the current condition of the force, but also in light of clear evidence of significant disconnects in where we think we need to go. By necessity, we are expending too much energy and resources patching up today's force to respond to near-term operations, while neglecting a true vision for the future. A clear roadmap to reach a vision of a fully capable 2020 aerospace force was presented, based on tying an integrated investment strategy directly to desired capability objectives. Then, based on the broad themes of balance and power projection, several possible future force structures were evaluated in terms of performance and cost implications. While the preferred option may be deemed cost prohibitive, a tradespace for the four best options was defined that would still produce an effective, balanced, and more affordable force structure for 2020.

Next, the unavoidable subject of affordability was broached—the Air Force and DoD are facing substantial funding challenges. It doesn't matter whether you're optimistic ($10B/yr short) or pessimistic ($100B/yr short), current and proposed funding levels over

the next two decades are insufficient to build a force anywhere along the continuum from the projected baseline force to one that acquires truly revolutionary capabilities. While it was shown that continued supremacy with today's robust economy is relatively affordable, the American public, bombarded in the media with domestic and other issues, frankly does not understand defense economics and what it will cost for the United States to continue to be a great power in the 21st century. It is critical that the new administration make this case clearly and let American citizens and their elected representatives decide whether or not a military—continuing to be second-to-none--is something they want to pay for.

Finally, a reminder of the urgency of any proposed actions--the U.S. Air Force has entered a critical period of vulnerability. One inescapable fact today is fleet aging--the average age of all air force aircraft in FY2000 is 20 years--well above the long-term, historical average of 15 years. In FY2010, with current modernization plans, the average age will be 28 years. In addition, the aging of the force will undoubtedly lead to unexpected equipment performance and flight safety problems that will require immediate action and dollars to fix, with the dollars coming again at the expense of modernization accounts. During this period of vulnerability, senior officials may be compelled to decide on force modernization strategies primarily on the basis of new equipment delivery times and near-term operational considerations, instead of long-term capability objective concerns. Similarly, chronic underestimating and acceleration of O&M costs caused by aging equipment will continue the migration of procurement dollars to O&M accounts, perpetuating Dr Gansler's "death spiral"--squeezed procurement accounts will lead to cutbacks or deferrals of planned procurements to the

future, unconstrained bow wave, which leads to increased unit costs, further squeezing the procurement accounts--and the vicious cycle continues to repeat itself.

We conclude the story with some final thoughts on the RMA. Is a revolution in military affairs achievable at the turn of the 21st century, and if so does it necessitate a radical change in U.S. military equipment, combat structures, and warfighting doctrine? Or can the United States continue to make security policy, and arrange budget priorities, in a more continuous and evolutionary way? Evidence suggests a true RMA may eventually be possible, but with current budgetary and political constraints, it does not appear within reach today. But that is not necessarily bad news. Rather than necessitating a wholesale transformation of the U.S. armed forces, current technological trends allow us to pursue an impressive military modernization strategy relatively inexpensively, and without the need to curtail our security commitments around the world. Rather, the ability of the United States Air Force to lead a "revolution in world affairs"--in which most of the world's other major industrial powers are democratic, prosperous, allied with each other and without major strategic enemies, and gradually extending their democratic influence to other countries—is even more historic and important than the ability to revolutionize warfare.

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