

What We Bought:
Defense Procurement from FY01 to FY10

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Executive Summary

Prevailing wisdom on defense spending in the past decade asserts that despite the large amount spent, we did not modernize our weapons systems. In reality, the military services did take advantage of increased procurement funding to modernize their forces, although not always as expected. This paper analyzes procurement funding of the last decade and demonstrates that though each of the services has followed a different approach in allocating these funds, they share a similar result: the services capitalized on funding to modernize their forces, especially the major weapons programs that constitute the heart of the services' capabilities.

In the last decade:

- Procurement funding grew dramatically — from \$62.6B in FY01 to \$135.8B in FY10.
- Supplemental war funding significantly enhanced the resources available for procurement, making up 22 percent of all procurement funding.
- Most procurement programs already have been almost completely funded.
- The Army had its next-generation acquisition programs cancelled, but that freed resources — enhanced by significant supplemental war funding — to expand and upgrade its primary combat vehicles and supporting capabilities, giving it a fully modernized force.
- The Air Force modernized its force by fielding the next-generation systems of the F-22 and C-17, and also introduced an entirely new capability — unmanned aircraft. The Air Force bought fewer fighters than it projected because it made a conscious choice to pursue high-end and expensive next-generation systems.
- The Navy achieved the modernized force it projected at the start of the decade, and relied on the dramatic expansion of procurement funding to achieve that force.

There will always be debate over what forces and equipment our military should pursue, but we should not ignore significant advances. Over the last decade, we spent roughly \$1 trillion on defense procurement and the military services used that funding, including that provided in the supplemental war funding, to modernize their forces.

Acknowledgements

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What We Bought: Defense Procurement from FY01 to FY10

As we near the end of 14 years of increased defense budgets, some have questioned what enduring purchases — if any — we’ve bought with those funds. As one witness testified before the House Armed Services Committee,

This build-up, however, is markedly different from defense build-ups of the past. In the aftermath of previous build-ups, budget cutters could count on reducing end-strength and paring back procurement. In the post-9/11 build-up, though, end-strength changed very little — Active Component end-strength has hovered around one-and-a-half million — while recapitalization and modernization plans for large parts of the forces were largely deferred, continuing the so-called “procurement holiday” of the previous decade.¹

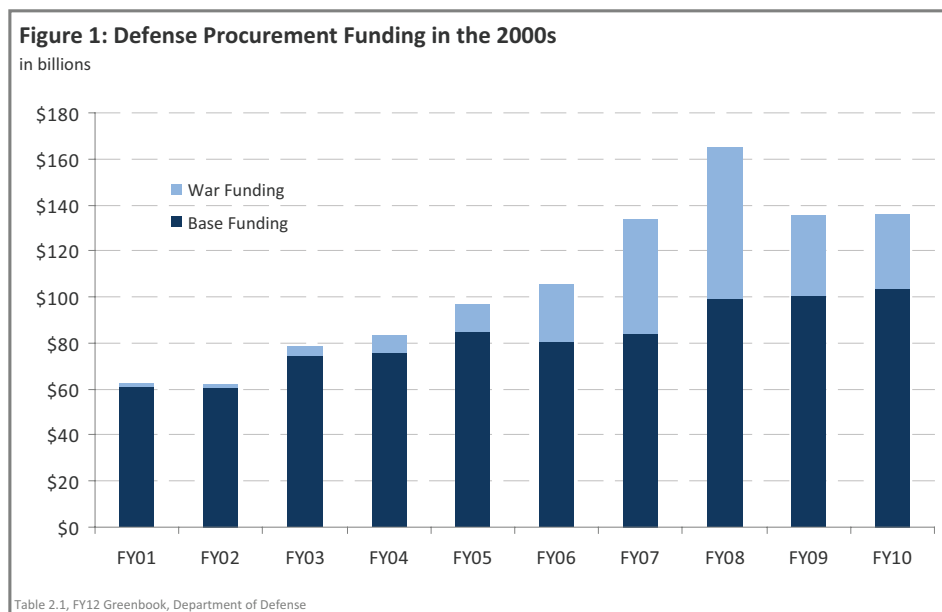
Yet we spent \$1 trillion on procurement alone in the 10 years from FY01 to FY10.² What did we buy with such large sums?

This paper examines these purchases. It examines what the last decade’s procurement funding was spent on, and assesses whether that funding bought advances in our military equipment. By providing such an evaluation, this paper will serve as a base from which to formulate questions of what and how we should buy in the future. This paper is not a comprehensive accounting of every dollar we spent, nor does it settle whether what we bought was the right thing to buy. It does not undertake a comprehensive strategic review to provide a benchmark against which to compare weapons systems and determine their “rightness.” Nor does it analyze whether the current defense and national budgeting processes produce the right weapon systems for today and the future.

After examining what we bought and in contrast to prevailing assumptions, this paper finds that in the last decade the military services did take advantage of increased procurement funding to modernize their forces, although not always as expected. By analyzing procurement funds, we can see how each of the military services spent the money they received, including amounts from supplemental war funds. Each of the services has followed a different approach in allocating its procurement funding, but they share a similar result of successfully modernizing their forces, especially the major weapons programs that constitute the heart of the services’ capabilities.

Overview of FY01 to FY10 Procurement Funding

Procurement funding grew from \$62.6B in FY01 to as much as \$135.8B throughout the decade.³ In constant dollars, base procurement funding in FY10 increased by 41 percent from FY01.⁴ Increases also were augmented by the use of supplemental war funding. In FY02, only \$1.4B was appropriated for procurement in supplemental war funding. That increased every year until \$65.9B was appropriated in FY08. FY08 ended up as the high water mark, but the following three years have all seen procurement funding of about \$30B included in war funding.⁵ In all, \$232.8B or 22 percent of total procurement funding in the last decade came from supplemental war funding. Although procurement funding increased in the base budget, supplemental war funding significantly enhanced the resources available.

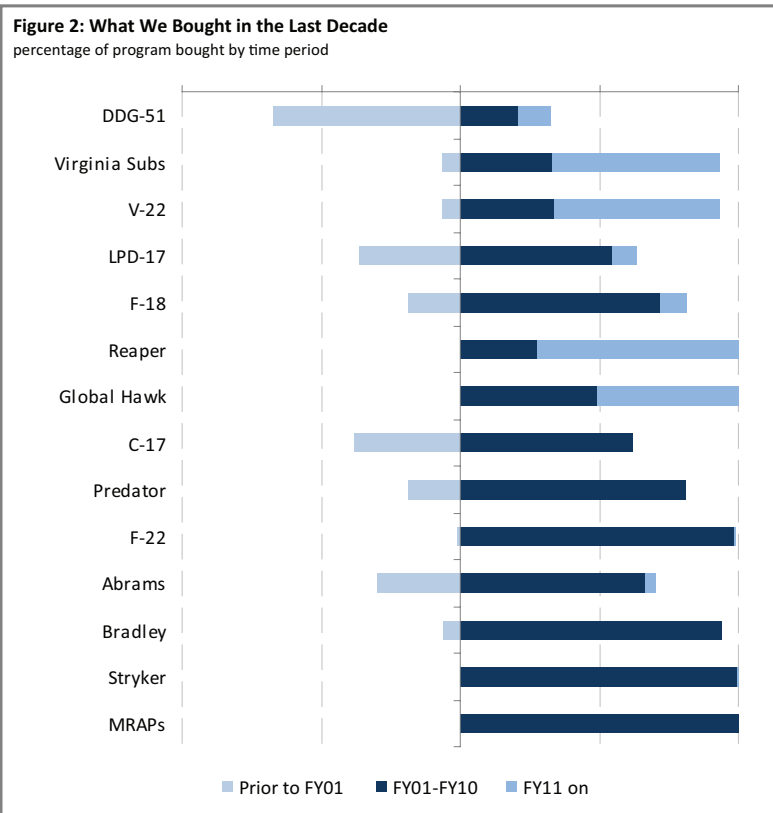


Procurement funding was not distributed equally across the services, which helped create different patterns of spending and modernization. The Navy and Air Force each received just less than 40 percent of base procurement funding in FY01: 37.4 percent and 38.6 percent, respectively. Those proportions remained steady throughout the decade. The Air Force received more than the Navy in the middle years of the decade, while the Navy started and ended with a slightly greater share than the Air Force. In contrast, the Army averaged only 20.7 percent of base procurement funding. Though the Army received 53 percent of all war funding for procurement, still it only received 26 percent of total procurement funding over the last decade. This is because supplemental funding is only a subset of the total. Nevertheless, because of the different distribution of procurement funding, the Army modernized differently than the other services, which will be examined later.

While procurement funding purchases a great many things, it is concentrated on a handful of weapons systems. Figure 2 displays the major weapons systems the services bought in the past decade. The 14 programs shown consumed almost 21 percent of the total procurement funds, despite being less than one percent of more than 1,600 different line items. They capture all but

two of the top 10 procurement programs by cost; the Ford-class aircraft carriers and the Army's Humvees aren't included, but are discussed in the sections below. All but four are in the top 20 programs in total cost. The Abrams and the unmanned programs are included because of their special significance to their respective service.

Figure 2 also supports the thesis of this paper: the services have modernized their major weapons programs using the procurement funding of the past decade. Figure 2 displays the proportion of each program's quantity procured by when each platform was bought — before this past decade, during this past decade, and still planned. All but one program have already been funded for more than 40 percent of their total planned buy; ten have been funded for more than 88 percent. Just as importantly, all but four programs were funded for more than 40 percent of the total quantity in the past decade alone. As the dark blue bars illustrate, procurement funding of the past decade have enabled the military services to modernize their forces.



The following sections analyze each service's procurement funding, and evaluate their approaches toward spending and its effects.

Army Programs

The Army has seemed to suffer worst of all in procurement. In the past decade, the Army has cancelled its next-generation major acquisition programs, including the Crusader artillery system, the Comanche attack helicopter, and the Future Combat Systems suite of vehicles. Because of the service's acquisition problems, the Secretary of the Army commissioned a study of the Army's acquisition process. The study found that the Army has spent at least \$1B a year since 1996 on cancelled weapons systems.⁶ Moreover, the Army, more than either other service, argues that its operations in Iraq and Afghanistan have created a need over the next two-to-three years to "reset" its equipment.⁷ Yet despite this drumbeat of apparent bad news, in the past decade the Army has modernized its fleets of combat and support vehicles, as well as its inventory of small arms. Today, the Army has an expanded force outfitted with the most up-to-date technology on platforms that are the best in the world.

First, in the last 10 years, the Army has purchased two fleets of armored vehicles it had no intention to buy at the start of the decade: Strykers and Mine-Resistant Ambush Protected Vehicles (MRAPs).

The Stryker emerged from former Chief of Staff Eric Shinseki's effort to create a force employing medium-weight armored vehicles, pending fielding of the Army's next generation acquisition program. He presented his concept in October 1999, the Stryker won the competition for the new vehicle in November of 2000, and the first production vehicle was delivered in April 2002.⁸ In these early years, the Army intended to field roughly 2,000 vehicles, but, as reported in the Pentagon's September 2010 selected acquisition report, this number had risen to 4,000 and equipped 10 Brigade Combat Teams.⁹ By September 2010, the Army had received \$12B in procurement funding, buying 3,974 Strykers — double the original number — and all but 24 of the total planned in the selected acquisition report. Debate still focuses on whether the Stryker was and is the right vehicle for the Army. However, it is because of the Stryker that the Army has a flexible, wheeled armored vehicle that has proven its use in our current wars. All have been bought in the past decade.¹⁰

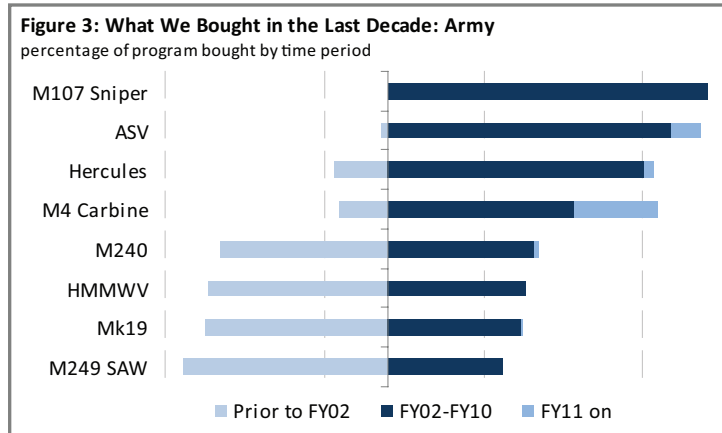
The MRAP is an even more dramatic tale. Faced with growing casualties in Iraq from improvised explosive devices, the Army was forced to upgrade the armor on its Humvees and trucks (and Strykers). But for two years after requests came in from the field for vehicles like MRAPs, the Army refused to purchase them in bulk.¹¹ Only under direct Congressional pressure — and congressionally provided funds in the supplemental war funding — did the Army begin to procure MRAPs in 2006, with the program taking off in 2008. Since then, the Army has bought more than 15,000 vehicles, spending more than \$20B in procurement funding. The Army only has recently started to plan to incorporate MRAPs into its force structure to take advantage of this investment, instead of mothballing them as they withdraw from Iraq.¹² MRAPs have proven their utility in the current conflicts and filled an important gap in Army capabilities.

Second, the Army also has succeeded in upgrading its primary ground combat vehicles over the past decade.¹³ Both the Abrams main battle tank and the Bradley infantry fighting vehicle were part of former Chief of Staff Creighton Abrams' "Big 5," his effort to modernize the Army post-Vietnam.¹⁴ Most were fielded during the Reagan build-up of the 1980s. By 1994, the Army had a major acquisition program to upgrade the Bradley; the Abrams upgrade program followed the next year. Both programs started gradually and only were planned for limited numbers. With the growth of procurement dollars — especially with additional supplemental war funding — the Army dramatically expanded and accelerated the fielding of both upgraded systems.

At the start of the past decade, the Army intended to upgrade about 1,806 Bradleys, 1,100 of them to the most advanced A3 variant. The Army had upgraded 266 by the end of FY00. By the end of FY09, however, the Army far exceeded its goal and had upgraded 4,372 Bradleys, 2,446 of them to the A3 variant — leaving the less capable ones mostly in the National Guard. The upgrade gives the Bradley a modern optics package, with a sight for the commander independent of the gunner, a communication suite including the Army's networked situational awareness package, and a fully integrated GPS navigation system.¹⁵ In other words, the upgrade gives the Bradley state-of-the-art digital technology. As the Army's own justification says, "the Bradley A3 will maintain combat overmatch over current and future threat forces and complements the M1A2 Abrams SEP (System Enhancement Program) tank." The Army completed its Bradley upgrade program in FY11, having modernized the bulk of the fleet.

The Abrams record is similar. In the FY00 budget justification, the Army stated its intention of modernizing about 1,700 tanks divided between the M1A2 upgrade and the M1A2 System Enhancement Program (SEP) that was entering production. By the end of FY00, they'd converted 360, all to the lower upgrade. In its FY12 budget justification, the Army reports to have upgraded 1,158 tanks — all to the more advanced SEP configuration — and plans to upgrade only 42 more in FY11 and FY12 to complete the program. As with the Bradley, the M1A2 SEP has modernized digital technology, including new optics and communications suites.

In the past decade, the Army has modernized nearly its entire fleet of ground combat vehicles despite its original intent to pursue a much more limited modernization plan. It did so because of the unexpected bonuses from the supplemental war funding. The Abrams and Bradley programs each received more than \$1B in both the FY07 and FY08 supplementals. Coupling that extra funding with a decade of procurement growth, the Army has now equipped its entire active force structure with the most modern variants of its basic vehicles.



Third, the Army dramatically increased its stocks of small arms and support vehicles.

As with its primary ground vehicles, the Army used the past decade's procurement funding to expand and accelerate fielding its small arms. In the FY01 budget justification, the Army said it intended to buy 140,309 of its newest rifle, the M4 carbine. By the FY12 budget justification, that plan had grown to 658,606 rifles (three and a half times the original plan), with 487,284 (nearly 75 percent) already purchased. The original target for the light machine gun, the M249 Squad Automatic Weapon was 79,848. By 2011, the Army had acquired 117,547. The target for the medium machine gun, the M240, was 63,471; by 2012 110,830 had been acquired. Both machine gun programs have already reached more than 1.5 times their original goal. For the Army's .50 caliber sniper rifle, first fielded in 2002, the Army planned to buy only 392. Ten years later, the Army had bought 3,396 — nearly nine times more than the original goal. These dramatic increases of scale only were possible because of the increased procurement funding of the past decade. The Army originally envisioned fielding these programs only to elite units, taking decades to disperse to the rest of the force. Today, they have been fielded throughout the Army.¹⁶

The same modernization process has taken place for Army support vehicles. The Humvee replaced World War II-era Army jeeps in the 1980s. At the start of the last decade, the Army intended to buy a total of 101,734 of them and had already bought 96,496 — or 95 percent of the buy — over the previous two decades. But at the outset of the war in Iraq, the Army discovered it was not well equipped to fight a counterinsurgency that didn't have a defined frontline. It required greater mobility. The Army's heavy units had tanks and Bradleys, but these were not well-suited to day-to-day patrolling. Light Army units were short of vehicles. As a result, it set out on a significantly

enlarged program to acquire Humvees, buying an additional 74,000 of the most modernized version, 77 percent more than it already had, for a cost of \$12.5B. Regardless of whether the Army will have to fight a war like Iraq again or whether there are other vehicles better suited to patrolling, the Army significantly expanded and upgraded its fleet of Humvees, its most flexible utility vehicle, during the last decade.

The same pattern has been true for other support vehicles, including the military police armored security vehicle; the new armored wrecker, the M88 Hercules; and the breaching vehicle. Today, the Army has a much larger inventory than it envisioned, sooner than it had planned.

At the start of the decade, the Army planned on devoting its procurement funding to the next-generation systems it intended to field. When these programs were cancelled because they were underdeveloped and already unaffordable, the Army instead spent the increased procurement funding it received on modernizing its existing forces. Programs that were originally slated to receive only limited funding instead received significant funding, especially from the \$124B in unexpected supplemental war funding, resulting in nearly the Army's entire inventory being modernized. Its combat vehicle fleet has been expanded and upgraded with state of the art technology, including digital situational awareness and communications suites. It also expanded the fielding of its supporting vehicles and small arms. Whatever its future needs and plans, the Army today is better positioned with modern equipment than any other army, due largely to its procurement investments. In the past decade, the Army almost unintentionally acquired a fully modernized force.

Air Force Programs

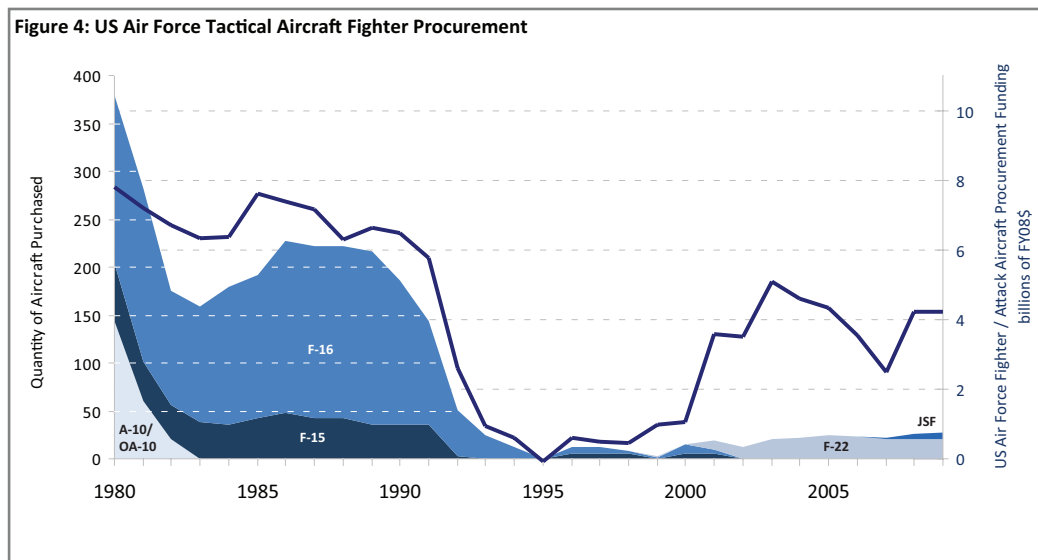
The Air Force has fielded the next-generation equipment intended to follow the Reagan-era systems, in contrast to the Army, whose procurement funding in the last decade went to modernizing its existing systems. Both the Air Force's primary fighter and mobility aircraft —the F-22 and C-17— are already bought at the total planned program levels because of the past decade's procurement funding. This reality is starkly dissonant from the steady drumbeat of stories about the aging of its fleet up until the firing of the Air Force leadership in 2008.¹⁷ Even now, rumblings of an impending disaster continue. *Air Force* magazine reported in April 2011: "the list of immediate needs is so great, next generation capabilities are on the back burner."¹⁸

Yet the Air Force spent \$347B on procurement in the last decade. Its procurement budget increased in constant dollars for eight straight years and in FY10 was 54 percent higher than it was in FY01, in constant dollars. How can the perception of the Air Force be so dire after so much spending?

Part of the answer lies in ignoring the aircraft the Air Force bought. The C-17 and F-22 programs make up 19 percent of its procurement funding in the last decade — excluding later modification costs — and were the two largest procurement programs in the entire Department of Defense. The Air Force also bought other aircraft, including a new fleet of unmanned aircraft, not just a next-generation system but a new capability. Part lies in the significant amount of classified funding built into Air Force procurement.¹⁹ But a greater part of the answer lies in understanding the explicit choice the Air Force made with its procurement dollars. The Air Force chose a much more

expensive fighter, which meant it could afford to buy fewer aircraft. The Air Force did modernize its force, but in a way that limited the total number of aircraft bought.

The F-22 was intended to be, and can rightly claim to be, the world's most advanced air-to-air fighter.²⁰ Capitalizing on the increased procurement, the Air Force bought 98 percent of its F-22s of the last decade. However, the Air Force will have acquired less than half the number it planned to buy at the start of the decade, and less than a third of the projected to buy from 20 years ago.²¹ That difference underlies much of why the Air Force's fighter aircraft inventory is aging—though even under the original plan, inventory still would have aged.²² The Air Force simply has not bought its next-generation fighter in numbers that match its acquisition of previous generations of fighters.



This is not to say that the Air Force did not spend significant amounts on fighters. Between 1981 and 1990, the Air Force bought 2,063 fighters. In contrast, between 2001 and 2010, it bought only 220. Yet between 2001 and 2010 the Air Force spent \$38B of procurement funding just on fighter aircraft in inflation-adjusted dollars, compared with the \$68B it spent between 1981 and 1990.²³ In other words, the Air Force spent 55 percent as much money to get 10 percent as many fighters.²⁴

The Air Force made a conscious choice to procure its impressive next-generation fighter, and focus funding on it. As *Air Force* magazine reported, Air Force Chief of Staff Norton Schwartz “has consistently and categorically said the Air Force will not spend scarce fighter dollars to buy new versions of older aircraft — i.e., to buy new-build F-15s and F-16s. The Air Force would rather stretch its existing equipment and wait for cutting-edge airplanes than buy new airplanes with 40 years of service life but only 10 years of survivability.”²⁵ The Air Force ended up with few fighters not because of a lack of procurement funding, but due to a choice to procure an expensive, high-end fighter.

The C-17 is also a high-end aircraft and consumed a significant part of Air Force procurement funds.²⁶ Sixty-two percent of the total C-17 program was procured from 2001 to 2010 at a cost of \$33.8B. In the original baseline plan of 1996, the Air Force intended to buy 210; this figure was lowered throughout the ‘90s. The Air Force reversed course in 2001, and increased the projected

buy to 180, to be completed in FY07. That year, Congress began funding additional C-17s in the supplemental war budgets, which it continued to do in FY08 and FY09. In FY10, Congress funded yet another 10 in the base defense appropriations bill for a total of 223 aircraft.

Secretary of Defense Robert Gates frequently cited the C-17 as an example of Congress putting political interests ahead of national security — although the fluctuating program total over the last 20 years suggest the specific number required may not be as rigorous as claimed.²⁷ In the end, Congress has the final authority to set the total number. Setting aside the debate over the right number, the fact remains the Air Force acquired the bulk of its C-17 fleet over the past decade after consciously choosing to pursue a high-end program.

Besides these two premier programs, the Air Force also invested heavily in aircraft programs it had not planned to buy at the start of the decade — unmanned systems. By buying these unmanned systems, the Air Force added relatively inexpensive, and more numerous, aircraft back into its fleet.²⁸ While the Predator unmanned aircraft was already a program of record at the start of the decade, 81 percent of the Predator buy was purchased in the past ten years, although due largely to pressure from the Secretary of Defense. The Air Force also developed and started buying the larger, next-generation unmanned MQ-9 Reaper drone. In the past decade, it bought a little over a quarter of the aircraft it plans to buy. The same is true for the RQ-4 Global Hawk, which first received procurement funding in FY01. Half of the intended buy was completed in the past decade. In the FY12 budget request, the Air Force actually curtailed the total Global Hawk program by 11 aircraft, increasing the share of the planned program bought in the last decade.

The “high-end” approach applies here, as well. The Air Force intends to continue buying the more high-end and expensive platforms, MQ-9 and RQ-4 — which made up 70 percent of the procurement funding on the three unmanned systems, but only 34 percent of the aircraft — even as it ends the cheaper program, the Predator. The Air Force also has terminated the manned, but less expensive, MC-12 surveillance aircraft and may transfer its existing aircraft to the Army.²⁹ Nevertheless, over the past decade, the Air Force has bought a substantial unmanned aircraft fleet of 352 Predator and Reapers. In some ways, it compensated for the lower number of high-end fighters with a drastically expanded purchase of relatively low-end unmanned aircraft.³⁰

The Air Force did not purchase one of its most publicized programs, the next-generation bomber. But it also did not plan to buy the bomber in this time frame. In a 1999 white paper, the Air Force stated that it did not need a new bomber until 2037, and the development process would not need to start until 2013.³¹ In 2006, this position was reversed, with the QDR projecting a goal of an initial operating capability for a next-generation bomber by 2018. The next year the Secretary and Chief of Staff of the Air Force included the next-generation bomber as one of their top acquisition priorities.³² The program was then cancelled and restarted. Despite this planning turbulence, at no time was the next-generation bomber ever projected to receive procurement funding from 2001 to 2010 — even for the accelerated fielding advocated by the 2006 QDR.³³

The Air Force did fail to start one new aircraft program during the past decade — the next generation air-refueling tanker — but not for lack of resources. At the start of the decade, the Air Force had begun to explore acquiring new aerial refueling tankers, although the initial plan was to lease, rather than buy them.³⁴ In response to opposition of this initial plan, Congress authorized

the Air Force to begin procuring new tankers as soon as 2004. The Defense Department postponed a decision when a scandal broke over Air Force officials taking bribes to facilitate the deal.³⁵ The Defense Department then undertook a formal request for tanker proposals in 2007 only to have its decision successfully protested, putting off procurement again. This past February, the Defense Department awarded a contract for procuring the next-generation tanker. Although the Air Force does not have either a new bomber or a new tanker, neither was for a lack of funding but for other unrelated reasons.

Like the Army, the Air Force has acquired considerable support capabilities over the past ten years.³⁶ It bought 63 percent of the CV-22 aircraft it plans for special operations forces and 355 new trainer aircraft, 79 percent of its plan. In addition, the ICBM fleet was modernized and bombers upgraded for smart bombs, all in the past decade.³⁷

In contrast to the Army, the Air Force consciously pursued the procurement of expensive, next-generation aircraft. Having made that choice, the Air Force today has already fielded its next-generation systems in two of its primary areas: fighters and airlift. For fighters, that choice has meant the Air Force has less than it projected despite the dramatic increases in procurement funding it received. But the Air Force offset some of that smaller quantity by buying unmanned aircraft in significant numbers. Here, too, the Air Force chose to pursue the next-generation system. The Air Force chose to use the past decade's procurement funding to modernize its forces and field those next-generation systems.

Navy Programs

The cancellations of the Navy's next-generation destroyer and the Marines' next-generation amphibious vehicle in the last two years suggest the Navy has not achieved its modernization goals. In reality, the Navy basically followed the plan it laid out at the start of the decade and, like the other services, today has a modernized force. The Navy was more systematic than the Army or Air Force in its modernization through eschewing next-generation systems, and thereby programming greater incremental advances. Using its more systematic approach, the Navy capitalized on the increased procurement funding of the past decade to achieve most of its plan despite complications along the way.

The Navy came close to meeting its shipbuilding plan from the start of the decade. In its 2000 Shipbuilding plan, the Navy said it would buy two carriers by 2010. It bought two carriers. It said it would buy two amphibious assault ships; it bought two amphibious assault ships (one of the old class, and one of the new class). It said it would buy eight amphibious transport decks, it bought six. It said it would buy 11 dry cargo carrier ships, it bought 12. It said it would buy 25 destroyers, it bought 18. It said it would buy 16 attack submarines, it bought 10. Although those numbers are close to the original plan, overall the Navy acquired slightly less than it had projected.³⁸

Yet Navy procurement resources rose significantly over the decade — funds from 2001 to 2005 were eight percent higher than projected, while the FY10 procurement budget was 34 percent larger than it was in FY01, in inflation adjusted dollars. What, then, did these funds buy?

Table 1: Navy Shipbuilding Procurement, FY01-FY10	Planned Purchases¹	Actual Purchases	Actual Cost⁵ in billions
Aircraft Carriers (CVN-77 & CVN-78)	2	2	\$16.8
Attack Submarines (SSN-7740)	16	10	\$28.0
Destroyers (DDG-51/DDG-1000)	25	18	\$28.9
Amphibious Assault Ships (LHD-8/LHA-6)	2	2	\$4.9
Amphibious Transport Decks (LPD-17)	8	6	\$11.0
Command and Control Ship ²	4	0	—
Dry Cargo Carrier (T-AKE)	11	12	n/a ⁶
Littoral Combat Ship ³	—	6	\$2.6
High Speed Vessel ⁴	—	2	\$0.4
Total	69	58	\$92.6

1 From the 2000 Navy Shipbuilding Plan.

2 The Navy withdrew plans for the Joint Command and Control ship in 2002.

3 The Littoral Combat Ship was formally announced in November 2001, after the 2000 Shipbuilding Plan.

4 An Analysis of Alternatives for what became the Joint High Speed Vessel was first conducted in 2005.

5 Actual cost is total spent from FY01 to FY10, but includes only procurement funding of the program's primary budget lines. It does not include modifications.

6 T-AKEs have been primarily funded in the National Defense Sealift Account, and so their funding is not covered by this report.

First, it bought back an underfunded shipbuilding plan. In 2000, the Congressional Budget Office published a report on the future of the Navy's fleet. It stated:

Current funding levels are inadequate to cover all of the ships and aircraft the Navy wants to buy and also maintain readiness and a good quality of life for sailors, pilots, and marines. To sustain its 300-ship fleet and inventory of aircraft, as well as the infrastructure that supports them, the Navy will need about \$105B annually (adjusted for inflation), CBO estimates. That amount is over \$17 billion more per year than the Navy is expecting to receive, on average, under the Administration's Future Years Defense Program for fiscal years 2001 through 2005 (referred to here as the 2001 FYDP).³⁹

Over the decade, the Navy did receive more resources than projected. The annual average (adjusted to FY01 dollars) of the Navy procurement budget was \$103B over FY01-FY05, and \$111B over FY01-FY10.⁴⁰ Because of those additional resources, the Navy was able to achieve its shipbuilding goals even though the original plan was under-budgeted.

Second, the Navy used the additional funding to buy back cost growth. Each ship program cited above has experienced cost growth in the past decade.⁴¹ The cost growth stemmed largely from design issues, which also drove schedule delays.⁴² Despite these delays, the programs continued to move forward. Increased procurement funding allowed the Navy to cover the additional costs to keep programs on track. Other than attack submarines, the Navy was able to buy most of what they planned despite the schedule delays and cost growth. For the Virginia class subs, the delay pushed the procurement of individual boats outside of the decade-long window examined here, although the Navy still plans to buy the same total quantity.⁴³

Third, and despite the rest of its approach, the Navy expended 10 percent of its shipbuilding funding chasing next-generation systems. In November 2001, Chief of Naval Operations Vernon Clark unveiled the Navy's future surface combatant fleet consisting of what would become the DDG-1000, the next-generation Cruiser, and the Littoral Combat Ship (LCS). Where the Air Force had been working on its next-generation systems since the 1980s, for the most part, these Navy programs didn't begin until the 1990s.⁴⁴ The DDG-1000 destroyer was the only program under way at the time of Admiral Clark's announcement. Since then, the Navy cancelled both the destroyer and the cruiser following dramatic cost growth in both, although three of the destroyers will still be built.⁴⁵ The Navy plans to substitute new DDG-51s — a program it had previously planned to end — for both the next-generation destroyer and cruiser. Although the Navy only bought 18 of 25 destroyers it planned to buy in the last decade, it now projects buying an additional 10 DDG-51s from FY11 to FY16.⁴⁶

The third system launched in 2001 — the LCS — remains in planning. The Navy bought only six LCS with \$2.6B in procurement funding in the past decade, as significant cost growth led to the cancellation of five ships. The Navy now plans to buy a total of 55 ships with the rest purchased at significantly less cost than the first ones, although the Congressional Budget Office estimates the cost will be 11 percent higher than the Navy projects.⁴⁷ Nevertheless, the LCS was not procured as planned this decade, despite the increases in procurement funding.

Perhaps most importantly, the Navy also invested in procurement other than ships, successfully modernizing its aircraft fleet.

In contrast to the Air Force's strategy for fighter modernization, the Navy accepted an incremental advance for its tactical fighters. It procured the F-18E/F Super Hornet rather than jumping to a true fifth generation fighter before the F-35 Joint Strike Fighter is fielded.⁴⁸ With that approach, the Navy was able to buy more than 369 new aircraft in the past decade, putting it within 10 percent of its original goal for fighter modernization.⁴⁹ At \$27B in procurement funding in the past decade, the Super Hornet was the Navy's second-largest procurement program. It netted the Navy two times as many fighters as the Air Force received, but at 80 percent of the cost.

The Navy bought other aircraft in the last decade. It modernized its electronic warfare capability, buying 78 of 114 planned E/A-18Gs with \$6B in procurement funding to replace the EA-6B, which dates back to the Vietnam era. It replaced the Marines' older aerial refueling planes with a \$3B investment in 39 KC-130Js, and is on track to double the inventory of the previous C-130s. The Navy consolidated its helicopter inventory into Seahawk variants by spending \$10B to buy 300 MH-60R and S model helicopters. It also spent another \$3B to recapitalize the Marine Corps' attack and utility helicopters. All-in-all, the Navy has modernized most of its aircraft inventory over the past decade.

Within the Navy procurement budget, the Marines pursued a next-generation procurement plan, focusing on the V-22 vertical take-off and landing aircraft, and the Expeditionary Fighting Vehicle (EFV). For the V-22, they acquired 155 aircraft, at a total cost of \$14B, or 34 percent of their total intended program.

Marine procurement plans for the EFV have gone worse. In 2001, the Marine budget justification said, "the first [EFV] production vehicle is planned for procurement in FY03 with delivery planned in FY04."⁵⁰ In January 2011, then-Secretary Gates announced the cancellation of the program without procuring a single production vehicle. However, the EFV cost more than \$200 million in procurement

funding through the decade — half a percent of Marine procurement, and six-hundredths of a percent of total Navy procurement. Its loss did not block procurement funding from other programs.

The Marines did better with their other acquisition programs over the decade, and modernized most of their equipment. Largely with supplemental funding, the service spent \$1.4B upgrading the LAV wheeled armored vehicle and \$500 million upgrading the fleet of amphibious tracked combat vehicles. They bought 500 new howitzers at a cost of \$1.2B and 5,000 new supply trucks at a cost of \$1.7B. And, like the Army, the Marines acquired thousands of MRAPs (the Navy rolls up MRAP purchases into its budget line for Explosive Ordnance Disposal purchases — but at \$7.2B that budget line was the 11th largest for the Navy in the past decade).

While the Marine Corps did not modernize its forces as completely as the Army, it did buy at least one expensive, next-generation program, the V-22, more closely resembling the Air Force's approach. Whether that is a better outcome for capability than other outcomes is a separate question. The bottom line is that the Marine Corps modernized capabilities and platforms using the procurement funding increases of the past decade.

Like the other services, the Navy ended the decade with a modernized force. Unlike the other services, it did so largely by achieving its original plan. Although it expanded its modernization plan when procurement funding began increasing, it also reduced that expansion when its new plans became unaffordable.⁵¹ The Navy relied on the increased procurement funding of the last decade to execute its plan; nevertheless, today it has a force that has achieved the capabilities it projected it would need. The Marine Corps had a mix of modernization; fielding one high-end, next-generation system but also capitalizing on supplemental war funding to upgrade its vehicle fleets.

Conclusion

There will always be a debate over which forces and equipment our military should acquire, but we should not ignore the significant advances made in the past decade. Since FY01, we spent roughly \$1 trillion on defense procurement, and the military services used that funding, including that provided in the supplemental war funding, to modernize their forces. In the daily barrage of news about cost overruns and cancelled programs, we can overlook this accomplishment. But after reviewing what procurement funding bought in the past decade, it is clear the military successfully modernized its capabilities, especially in building on existing systems and incorporating those not even anticipated.

At the start of the second decade of the 21st century, US military capabilities and technology are the most advanced in the world. Although much of the US military strength is rooted in the professionalism and dedication of the people in the services, they are also outfitted with the best equipment in existence. The Army has higher quality and more modern tanks, fighting vehicles, supply trucks, small arms, helicopters, and support equipment than it had at the start of the decade. The Air Force has better fighter, airlift, and unmanned aircraft. And the Navy and Marines have better ships, aircraft, and support equipment. Even as the debate of what we should buy rightfully continues, we should not dismiss what we have already bought.

Endnotes

- 1 Jim Thomas, Vice President for Studies, Center for Strategic and Budgetary Assessments, Statement before the House Armed Services Committee, September 13, 2011. Also see “Warning: Hollow Force Ahead: The Effect of Ever More Defense Budget Cuts on US Armed Forces,” *Defending Defense: A joint project of AEI, Heritage, and the Foreign Policy Institute*, July 2011, p. 5. An example from press reporting is Nathan Hodge, “Geriatric’ US Arsenal Needs Expensive Face-Lift,” *Wall Street Journal*, September 15, 2011.
- 2 Compiling data from DoD’s P-1 displays using actual year data. The total for FY01-FY10 is \$1,055.117B. OMB’s FY12 Budget Authority Public sums to \$1,058.713B. Unless otherwise noted, all figures in this report are taken from the compiled P-1 displays. From FY05-FY09, the Air Force did not include its classified funding. For the years FY03-FY07 (the actuals reported in the budget years), these figures include a plug of the difference between the P-1 data and the FY12 Greenbook Table 6-19 data for Air Force Procurement into the “Classified Programs” line rounded down to the nearest billion. Procurement is a broad category, as it includes everything from purchases of capital ships, which would certainly not be considered consumables, to spares and repair parts, which likely would. Procurement, however, does not include pure consumables like fuel or other operating costs, which are included in Operations and Maintenance. Procurement also does not include research and development funds.
- 3 Data in this section is taken from Table 2.1 of the FY12 DoD Greenbook in order to separate base and war funding.
- 4 Base funding is all funding not designated war funding, and includes other supplemental funding.
- 5 Note that the third year, FY11, is not included in this study to provide an exact decade to examine.
- 6 “Army Strong: Equipped, Trained, and Ready,” Final Report of the 2010 Army Acquisition Review, January 2011. Note these costs were on development, test, and evaluation funding and not procurement funding, which this study examines.
- 7 Statement by The Honorable John McHugh, Secretary of the Army, and General George Casey, Chief of Staff, Senate Committee on Armed Services, March 31, 2011. However, the Congressional Budget Office has expressed skepticism at the scale of the Army’s requirement. “Replacing and Repairing Equipment Used in Iraq and Afghanistan: The Army’s Reset Program,” Congressional Budget Office, September 2007.
- 8 Kris Osborn, “Army Marks 10-year Stryker Anniversary,” Assistant Secretary of the Army (Acquisition, Logistics, and Technology), May 9, 2011.
- 9 Army Congressional Budget Justification. In FY03, the P-40 projected a total program of 2,119. In FY04, the program was 2,086. By FY11, the program had grown to 4,394.
- 10 Colin Jackson, “From Conservatism to Revolutionary Intoxication: The US Army and the Second Interwar Period,” in Harvey Sapolsky, Benjamin Friedman, and Brendan Green, eds., *US Military Innovation Since the End of the Cold War: Creation Without Destruction* (Routledge: 2009).
- 11 Christopher Lamb, Matthew Schmidt, and Berit Fitzsimmons, “MRAPs, Irregular Warfare, and Pentagon Reform,” Institute for National Security Studies, National Defense University Occasional Paper, June 2009, pages 10-15. Note the Marines did no better than the Army fielding MRAPs.
- 12 Andrew Feickert, “Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress,” Congressional Research Service, January 18, 2011.
- 13 The Army has had similar upgrade programs for its three major helicopters: the UH-60 Blackhawk, the AH-60 Apache, and the CH-47 Chinook. It is hard to distinguish when each wave of upgrades starts and ends, so they have been left out of this analysis because the data is unclear.
- 14 General Abrams’ Big 5 programs became the M1 Abrams tank, the Bradley infantry fighting vehicle, the Apache attack helicopter, the Blackhawk utility helicopter, and the Patriot air defense system.
- 15 US Army Fact File.
- 16 Army Weapon Systems, 2002 and 2011.

- 17 Jason Lake, "Replace Aging Aircraft or Risk Irrelevancy, General Says," Air University Public Affairs, March 5, 2008. Similar stories appeared in other outlets. For instance, Kent Harris and Jennifer Svan, "War Puts Strain on Air Force's Aging Fleet," *Stars and Stripes*, April 6, 2008.
- 18 John Tirpak, "Flatline Danger," *Air Force* magazine, April 2011.
- 19 Part of the answer also is due to classification. Thirty-nine percent of the Air Force's procurement budget in the last decade falls under the simple heading of "Classified Programs" or "Selected Activities." For national security reasons, what is in that category cannot be described here. Presumably it does not alter the analysis of this report; if what the \$135B bought could be described (even without assuming it is procurement), presumably it would paint an even more optimistic picture of our national security.
- 20 "As I have said before, the F-22 is far and away the best air-to-air fighter ever produced, and it will ensure US command of the skies for the next generation," Robert Gates, Secretary of Defense, Remarks at the Air Force Academy, March 4, 2011.
- 21 The F-22 buy was ended famously by Secretary Gates in the FY10 budget request, one year after he fired the Air Force Secretary and Chief of Staff who had both advocated buying 381 F-22s, despite the program of record having been 181 since 2004. Michael Wynne, Secretary of the Air Force, and Michael Moseley, Chief of Staff of the Air Force, "Hearing on Air Force Strategic Initiatives," House Committee on Armed Services, October 24, 2007.
- 22 For a description of how the Air Force's plan would have come up short no matter how well executed, see Government Accountability Office, "TACTICAL AIRCRAFT: Modernization Plans Will Not Reduce Average Age of Aircraft," GAO-01-163, February 2001.
- 23 Congressional Budget Office data in FY08 dollars. See Matthew Goldberg, "Presentation to the National Committee on Fiscal Responsibility and Reform," Congressional Budget Office, June 9, 2010.
- 24 This point is slightly overstated because the F-16 is the anomaly, not the 1980s. Thirty-six percent of the 1980s procurement funding went to the F-15, which made up only 19 percent of the fighters bought in that time. See note 19 for a description of how the Air Force's plans would not have adequately kept pace with its aging inventory. For a description of how the forces driving down fighter procurement were already at work, see William White, "US Tactical Air Power: Missions, Forces, and Costs," (Brookings Institution: 1974). For a brief history of the F-16, see James Fallows, "National Defense," (Random House: 1981), pages 95-106 or Jerauld Gentry, "Evolution of the F-16 Multinational Fighter," Student Paper, Industrial College of the Armed Forces, 1976.
- 25 John Tirpak, "New Life for Old Fighters," *Air Force* magazine, February 2011.
- 26 "Improving Strategic Mobility: The C-17 Program and Alternatives," Congressional Budget Office, September 1986.
- 27 Jim Garamone, "Gates Vows to Focus on Reform, Reducing Overhead," American Forces Press Service, May 20, 2010.
- 28 Special thanks to Mark Cancian for the insight that the Air Force has backed itself into a high-low mix, with the low being unmanned aircraft.
- 29 Michael Hoffman, "Surprise plan would transfer MC-12s to Army," *Air Force Times*, July 18, 2011.
- 30 Jim Hodges, "Relief for Strained Predators," *Training and Simulation Journal*, March 28, 2009 and Michael Hoffman, "Gates Issues Call for More UAVs, Fresh Thinking," *DefenseNews*, April 21, 2008.
- 31 "White Paper on Long Range Bombers," US Air Force, March 1, 1999.
- 32 US Air Force, "Posture Statement," 2007
- 33 See Jeremiah Gertler, "Air Force Next-Generation Bomber: Background and Issues for Congress," Congressional Research Service, December 22, 2009, for a brief history of the program, and most importantly, a display of the proposed research and development funding for the program.
- 34 General Charles T. Robertson, Commander US Transportation Command, Testimony before Senate Armed Services Subcommittee on Seapower, April 26, 2001: "To further quantify the future requirements of our forty-year old KC-135 force a Tanker Requirements Study 2005 and an Economic Service Life Study were recently completed. The results are just now being finalized, and once complete, will allow us to better determine the most appropriate "way ahead" for this still reliable, but rapidly aging fleet."
- 35 For a brief overview of the history of replacing the tanker, see Appendix C, Jeremiah Gertler, "Air Force KC-X Tanker Aircraft Program: Background and Issues for Congress," Congressional Research Service, May 14, 2010.

- 36 This report has not included the Air Force's procurement of satellites and other space programs. Space programs are a significant part of Air Force procurement, making up about 9 percent of spending over the last decade. But they have unique attributes that make them difficult to compare to other procurement programs. They consist of buying small numbers—single-digits—of satellites at very high costs — billions per satellite — with much greater redundancy requirements than other military systems. Because of these unique attributes, space programs and their problems are fairly distinct from other procurement programs, and have suffered significant cost problems. Of nine space programs listed in the December 2001 selected acquisition report, six have suffered Nunn-McCurdy breaches. For more information, see Christina Chaplin, "SPACE ACQUISITIONS: Major Space Programs Still at Risk for Cost and Schedule Increases," Testimony before the Subcommittee on Strategic Forces, US Senate Armed Services Committee, March 4, 2008, Government Accountability Office.
- 37 Janae Daniels, "Minuteman III Replacement Program Wraps Up," July 23, 2009, and "Northrop Grumman/Air Force Complete Guidance Upgrade Installations On Minuteman III ICBMs," Northrop Grumman Press Release, March 11, 2008.
- 38 The one program where the Navy bought more than it intended, the T-AKEs, were primarily funded in the National Defense Sealift Fund, not in Navy Shipbuilding procurement accounts examined in this paper; they have been excluded from further analysis.
- 39 "Budgeting for Naval Forces: Structuring Tomorrow's Navy at Today's Funding Level," Congressional Budget Office, October 2000, page 17.
- 40 Conclusion reached using FY12 Greenbook table 6-10 actuals for Budget Authority. Using the same table from the FY01 Greenbook puts the average annual Navy budget over the FY01-FY05 FYDP at \$86.9B, roughly \$1B less than CBO calculated. Calculations are based on OMB's defense deflators in FY12 Table 10.1.
- 41 Paul Francis, "Realistic Business Cases Needed to Execute Navy Shipbuilding Programs," Testimony before the Subcommittee on Seapower and Expeditionary Forces, House Armed Services Committee, Government Accountability Office, July 24, 2007.
- 42 Each of the ships was bought later than planned, except for the amphibious assault ships (both the older class LHD-1 and the newer class LHA-6 were bought earlier than anticipated). For a detailed description of the LPD-17's design and construction problems, see Appendix C, Ronald O'Rourke, "Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress," Congressional Research Service, March 16, 2011. For a broader discussion of what drives cost growth, see GAO's annual series on "Defense Acquisitions: Assessments of Selected Weapons Programs," the latest of which was published in March 2011.
- 43 The amphibious transport decks, LPD-17s, also had a ship pushed out of the decade-window examined here. But because four ships were bought prior to the window, the program has still almost reached its total because of the last decade's procurement funding.
- 44 See Robert Work, "Naval Transformation and the Littoral Combat Ship," Center for Strategic and Budgetary Assessments, February 2004. Philip Ewing notes that some of the Navy's focus on the new combatants stemmed from Secretary of Defense Donald Rumsfeld's focus on "Transformation." "Navy Frigate Fantasies Die Hard," August 22, 2011.
- 45 Megan Scully, "Navy to Cancel New Destroyer Program and Buy Older Model," *Congress Daily*, July 23, 2008 and Department of the Navy, Office of Budget, Highlights of the Department of the Navy FY 2011 Budget, February 2010, p. 5-7.
- 46 In the 2000 Shipbuilding Plan, the Navy had intended to buy 16 destroyers — the next-generation destroyers — over that same period; therefore, the Navy still will not have caught up to its 2000 plan.
- 47 "An Analysis of the Navy's FY12 Shipbuilding Plan," Congressional Budget Office, June 2011, pp. 20-21. For additional information, see Appendices C and D, Ronald O'Rourke, "Navy Littoral Combat Ship (LCS) Program: Background, Issues, and Options for Congress," Congressional Research Service, January 11, 2011.
- 48 Sydney J. Freedberg, "Aging Aircraft," *National Journal*, March 15, 2008.
- 49 GAO discussed the different modernization strategies of the Navy and Air Force in 2001. The Navy's strategy has, for the most part, been executed while the Air Force's was severely truncated. Government Accountability Office, "TACTICAL AIRCRAFT: Modernization Plans Will Not Reduce Average Age of Aircraft," GAO-01-163, February 2001. However, despite the choice, the delays of the F-35 program still threaten execution of the Navy's longer-term modernization. Nevertheless, it can be argued the Super Hornet decision has put the Navy within striking distance of solving the longer-term modernization dilemma in a way the Air Force is not. For a description of the Navy's modernization goals and strategy, as well as plausible alternatives for the next 15 years, see "Strategies for Maintaining the Navy's and Marine Corps' Inventories of Fighter Aircraft," Congressional Budget Office, May 2010.
- 50 The EFV originally was called the Advanced Amphibious Assault Vehicle (AAAV). "Department of Navy FY2002 Amended Budget Submission, Procurement, Marine Corps," June 2001, Item No. 2, Page 1 of 7.

- 51 This report is intended simply as a discussion of what we bought for our increased procurement spending, without debating or even considering what we should have bought or should buy in the future. For both the Army and the Air Force, this story is fairly straightforward — we now possess enhanced military capabilities because of our procurement funding, even though neither services' procurement plans came to fruition as they envisioned. The Navy is a more interesting case. It successfully achieved its procurement goals where it explicitly sought only incremental improvements in its new programs. Conversely, it failed to achieve its goals where it sought to jump to a next-generation type capability. Yet in the end it modernized much of its forces because the incremental programs continued to substitute for the failed programs. Such a case study almost directly contradicts the goals of “transformation” advocates at the start of the decade, who argued for “skipping a generation,” and used constrained budget resources as a justification for doing so. But, of course, that argument should properly be handled in a separate report. For a skeptical treatment of transformation midway through the decade, see Thomas Ricks and Josh White, “Scope of Military Change is Ambiguous,” *Washington Post*, August 1, 2004. For a review of transformation, see Lloyd DeSerisy, “Military Transformation: Issues for Congress and Status of Effort,” Congressional Research Service, May 14, 2003. For a defense of the need for and an explication of transformation, see Andrew Krepinevich, “Defense Transformation,” Testimony before the Senate Armed Services Committee, April 9, 2002.