Aircraft Investment Plan

Fiscal Years (FY) 2011-2040

Submitted with the FY 2011 Budget

February 2010

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Aircraft Investment Plan

Part I – Executive Summary

I. Introduction

Chapter 9, Section 231a of Title 10 United States Code requires the Secretary of Defense to submit an annual long-term plan for the procurement of fixed-wing aircraft with the defense budget. This report responds to that requirement.

The report is the Department's first submission of a long-range fixed-wing aviation procurement plan. Guided by the *2010 Quadrennial Defense Review* (QDR), the plan represents the Department's commitment to a balanced force: one that is able to meet the unique demands of current conflicts, while providing the flexibility to respond to a broad spectrum of future challenges.

The FY 2011-2015 Future Years Defense Program (FYDP) and the long-term aviation force structure and investment plans presented in this document are shaped by four strategic priorities defined in the 2010 QDR:

- Prevailing in today's wars;
- Preventing and deterring conflict;
- Preparing to defeat adversaries and succeed in a wide range of contingencies; and
- Preserving and enhancing the all-volunteer force.

To accomplish these objectives, the Department's future fixed-wing aviation force must be able to carry out or contribute to the following six key joint missions:

- Defend the United States and support civil authorities at home;
- Conduct counterinsurgency, stability, and counterterrorism operations;
- Build the capacity of partner states;
- Deter and defeat aggression in anti-access environments;
- Prevent the proliferation of and counter weapons of mass destruction; and
- Operate effectively in cyberspace.

II. Summary of the Aircraft Investment Plan

In keeping with the Department's desire to provide a flexible and balanced force, the aviation plan provides the diverse mix of aircraft needed to carry out the six joint missions identified above. The very nature of modern warfare makes categorizing aircraft into bins of like capability more and more difficult. When considering aviation investment plans, the Department must increasingly consider the potential complementary capabilities resident in the cyber and space domains, as well as across other aircraft types.

The capabilities provided by aircraft identified in this plan translate into four principal investment objectives that were reflected in the FY 2010 budget and are carried forward in the FY 2011 budget request and the FY 2011-2040 aviation plan:

- **Meet the demand for persistent, unmanned, multirole intelligence, surveillance, and reconnaissance (ISR) capabilities.** The number of platforms in this category—Global Hawk-class, Reaper, and Predator-class systems— will grow from approximately 300 in FY 2011 to more than 800 in FY 2020, including the Army's Extended-Range/Multipurpose unmanned aerial system (UAS) and the Navy's Broad-Area Maritime Surveillance UAS aircraft. This nearly 200 percent capacity increase will be effectively multiplied by capability improvements afforded by the acquisition of vastly improved sensors and the replacement of Air Force Predators with more capable Reapers. This plan calls for growth in Air Force unmanned Predator and Reaper platforms from a capacity of 50 orbits in FY 2011 to 65 by FY 2013. The Department will assess the need for more capacity in future plans.

- **Provide sufficient enabler capability and capacity.** Our airlift inventory is robust and stable. Both the Air Force and Navy are recapitalizing their intratheater lift inventories. The Air Force continues to modernize the strategic lift inventory, which is projected to remain viable through the years covered by this plan. The Air Force is beginning the recapitalization of the tanker fleet. The Air Force plans to develop and procure 109 new KC-X tankers by 2020. Simultaneously, it is sustaining its fleet of airborne early warning aircraft. The Air Force anticipates recapitalizing that fleet in the far term. The Navy is recapitalizing its fleet of airborne early warning aircraft with the E-2D aircraft carrying a new radar capable of operating in stressful anti-access environments. The Navy is also recapitalizing its aged fleet of maritime patrol aircraft with a modern commercial aircraft variant equipped with a sensor suite that provides persistent undersea and anti-surface warfare capabilities. Finally, the Navy will recapitalize its expeditionary electronic warfare capabilities, resulting in a total of 14 EA-18G squadrons.

- **Acquire fifth-generation fighter/attack aircraft.** The Department's fifth-generation assets will grow from about 7 percent of the current force of manned fighter/attack aircraft to about 34 percent by FY 2020. The Joint Strike Fighter (JSF) will account for the bulk of DoD's fifth-generation inventory. This aviation plan reflects the restructured JSF program and incorporates the Department's latest estimates of schedule and cost performance. The Air Force continues to modernize its fleet of F-22 aircraft, and the Navy is completing production of the fourth-generation FA-18E/F aircraft. By FY 2040, almost all of today's "legacy" force will have retired and the Department will have begun recapitalization of its fifth-generation force. These far-term recapitalization plans cannot be defined with any degree of precision today, making investment projections difficult beyond the well-understood procurement plans for the JSF. The Department is continuing to evaluate projected threats and the alternative means for defeating those threats. It is anticipated that a family of systems—mixes of manned and unmanned aircraft, with varying stealth characteristics, and advanced standoff weapons—will shape the future fighter/attack inventory. These tradeoffs are being examined now, and subsequent aviation plans will reflect the resulting acquisition decisions.

Modernize long-range strike capabilities. The current fleet of Air Force bombers continues to be modernized, since much of today's inventory will remain relevant through FY 2040. As with the fighter/attack force, the aviation plan foresees a family of systems providing the solution to the enduring need for timely long-range strike capabilities. A study is underway to identify the right mix of manned and unmanned technologies that will provide future long-range strike capabilities and to determine the right balance between range, payload, speed, stealth, and on-board sensors. A product of that study will be the identification of a replacement aircraft for the aging aircraft in the legacy bomber fleet and the timing and funding profile required to support this aircraft.

The FY 2011-2040 aviation plan is consistent with the tenets of the QDR and meets the national security requirements of the United States. The FYDP provides the funding needed to implement the aviation plan through FY 2015. For the years beyond the FYDP, the funding projections presented in the plan assume 3 percent real growth in annual investments, on average. While optimistic, funding increases of that size are consistent with the Secretary of Defense's statements about the budgetary growth needed to ensure that U.S. forces remain capable of meeting national security requirements in the decades ahead. The aviation plan incorporates realistic projections of program costs within the FYDP period. The funding profiles for individual programs were derived from independent cost estimates, where possible, or from historical data.

This first aviation plan does not foresee major industrial-base issues. Although there are impacts to specific corporate interests in certain sectors, there are no immediate concerns about the robustness of the American aviation industrial base. The funding blueprint for aviation programs reflected in the plan suggests that the nation's aviation industry will remain strong into the distant future.

Aircraft Investment Plan

Part II – FY 2011 Report

Chapter 9, Section 231a of Title 10 United States Code requires the Secretary of Defense to submit an annual long-term plan for the procurement of fixed-wing aircraft with the defense budget. This report responds to that requirement.

The report presents:

- A description of the aviation force structure needed to meet the national security requirements detailed in the *2010 Quadrennial Defense Review* (QDR).
- A detailed plan for Departments of Air Force and Navy investments in fighter/attack; intelligence, surveillance, and reconnaissance (ISR); strategic and intratheater lift; tanker; and bomber airframes.
- Estimates of the annual expenditures necessary to carry out the plan.
- A certification by the Secretary of Defense that both the FY 2011 budget request and the associated Future Years Defense Program (FYDP) provide sufficient funding to execute the plan through FY 2015.
- An assessment by the Secretary of Defense of the extent to which the combined aviation forces of the Departments of the Air Force and Navy meet the national security requirements of the United States.

In calling for this report, the Congress asked for a comprehensive description of Department of Air Force and Navy aircraft procurement plans for the next 30 fiscal years. In responding to that request, the report provides full details on anticipated procurements, the associated annual investment, and the resulting aircraft inventories for the first 10 years of the 30-year plan. For the remaining 20 years, the report provides a recapitalization blueprint reflecting aircraft acquisition needs that can be predicted today. The reasons for this approach are fourfold:

- A changing strategic environment will likely require continuous adjustments in aviation investments. National security requirements could arise in the 2020s and 2030s that cannot be foreseen today, just as the heavy reliance on unmanned vehicles could not have been anticipated ten years ago.
- The life-span of many military aircraft is extremely difficult to predict and is affected by both operational tempo/airframe service life and the cost-benefit calculus applied to modernization decisions. A 30-year plan would necessitate the identification of follow-on systems for platforms the Department is only now beginning to field, such as the Joint Strike Fighter (JSF). Such new development initiatives have yet to be

informed by either concrete threat analyses or formal analyses of alternatives and are, therefore, speculative.

- The QDR left unanswered some questions that will define future fixed-wing procurement plans. Specifically, questions about the mix and capabilities of carrier-based manned and unmanned systems and about the role of Air Force bombers in a family of systems delivering long-range strike capabilities are currently being evaluated by the Department. The answers to these questions will, to a large extent, shape the Department's investment plans in the 2020s and 2030s.
- The Department's aviation plan has immense complexity relative to the more mature shipbuilding plan. The aviation plan covers three services and deals with a functional area that has, in general, a much shorter technological half life.

While not explicitly mandated by Congress, the plan includes engineering and manufacturing development (EMD) cost estimates because of the criticality of research and development to any realistic aviation plan. The plan also projects aircraft inventories; aircraft inventory trends provide a context for relating aviation investment plans to the defense strategy.

The majority of modern platforms have the ability to perform across many traditional mission sets (e.g. the surveillance and strike capability of the MQ-9 and the cargo and aerial refueling capability of the KC-130). The multirole nature of our assets makes them highly adaptive, fostering significant mission flexibility for the joint force. For the purposes of this report, the aviation plan groups aircraft into seven categories according to their primary mission: fighter/attack; unmanned multirole surveillance and strike; ISR/command and control (C2); intratheater lift; strategic lift; aerial refueling tankers; and bombers. Rotary wing, tilt-rotor, and trainer aircraft are not included.

The aircraft included in each mission category are shown in Chart 1 below.

Chart 1. Aviation Investment Plan Taxonomy

	Fighter/Attack	Unmanned Multirole Surveillance and Strike	ISR/C2	Intratheater Lift	Strategic Lift	Aerial-Refueling Tanker	Bomber
USAF	A-10, F-16C-D, F-15C-E, F-22A, F-35A	MQ-9	MQ-1, RQ-4, U-2, E-3, E-4, E-8, RC-135, M/RC-12	C-130E/H/J, C-27, WC-130J, JFTL[1]	C-5, C-17, C-X	KC-135, KC-10, KC-X	B-1, B-2, B-52, LRPS[2]
DoN	F/A-18A-F, EA-18G, AV-8B, EA-6B, F-35B/C	CVN UAS[3], USMC Group 4[4] UAS	BAMS[5], E-2, P-3, P-8	C-130J, C-2, C-40		USMC KC-130	

[1]JFTL-Joint Future Theater Lift.
[2]Long-Range Persistent Strike.
[3]Carrier Based Unmanned Aerial System.
[4]USMC Group 4 Unmanned Aerial System.
[5]BAMS-Broad-Area Maritime Surveillance (Navy adaptation of RQ-4 Global Hawk).

Force Structure Requirements

The Department's FY 2011-2040 aviation investment plan provides the mix of forces and capabilities to meet the broad array of security challenges the nation faces. The plan represents the Department's ongoing commitment to support the joint force wherever it might be deployed and in whatever missions it is called on to perform, from the current operations in Iraq and Afghanistan and humanitarian relief efforts in Haiti to preparations for potential new regional conflicts. Accordingly, the aviation plan provides the aircraft needed to cover the full complement of operations that U.S. military forces could undertake in the decades ahead, and it will evolve as security needs change. As Secretary Gates has stated, "What is needed is a portfolio of military capabilities with maximum versatility across the widest possible spectrum of conflict."[1]

Consistent with this vision, the FY 2011-2040 aviation plan provides the capabilities needed to meet current and projected national security objectives, while prudently balancing security risks against fiscal realities. The FY 2011-2015 FYDP and the long-term aviation force structure and investment plans presented in this document are shaped by four strategic priorities defined in the 2010 Quadrennial Defense Review:

- Prevailing in today's wars;
- Preventing and deterring conflict;
- Preparing to defeat adversaries and succeed in a wide range of contingencies; and
- Preserving and enhancing the all-volunteer force.

To accomplish these objectives, the future fixed-wing aviation force must be able to carry out or contribute to the following six joint missions:

- Defend the United States and support civil authorities at home;
- Conduct counterinsurgency, stability, and counterterrorism operations;
- Build the capacity of partner states;
- Deter and defeat aggression in anti-access environments;
- Prevent the proliferation of and counter weapons of mass destruction; and
- Operate effectively in cyberspace.

In balancing near and longer-term risks, the aviation plan acknowledges and places top priority on the capabilities needed to prevail in today's conflicts. The nature of the wars in Afghanistan and Iraq—with enemies hiding among populations, manipulating the information environment, and employing a mix of tactics and technology—provides a glimpse into the operational demands of potential future conflicts.

Beyond the challenges U.S. forces confront today, potential adversaries are acquiring a wide range of sophisticated weapons and supporting capabilities that, in combination, could impede the deployment of U.S. forces to a conflict and blunt the operations of those forces that do deploy forward. In planning for an uncertain future, the key consideration is ensuring that the

[1] Defense Secretary Robert Gates, speech to the Economic Club of Chicago, July 16, 2009, http://www.defenselink.mil/speeches/speech.aspx?special=1369.

United States possesses the aviation capability and capacity to deter war and, should deterrence fail, win wars.

DoD's planned FY 2011 aviation force structure satisfies the demands of the national security strategy and emerging needs identified in the 2010 QDR. The combined aviation forces of the Departments of the Navy and Air Force will provide the requisite capabilities and capacity to carry out the broad range of missions they could be required to conduct in the decades ahead. As demands on the force evolve, the size and mix of aviation forces will change as well.

In addition to the combat aviation structure, the Defense Department maintains a large and diverse array of support elements that facilitate the combat readiness of aviation forces. These elements perform acquisition, engineering, test, evaluation, life-cycle management, and sustainment functions. The operating forces could not conduct their missions without this support.

The FY 2011 aviation force structures of the Departments of the Navy and Air Force are shown in Charts 2 and 3 below.

Chart 2. Department of Navy Force Structure, FY 2011

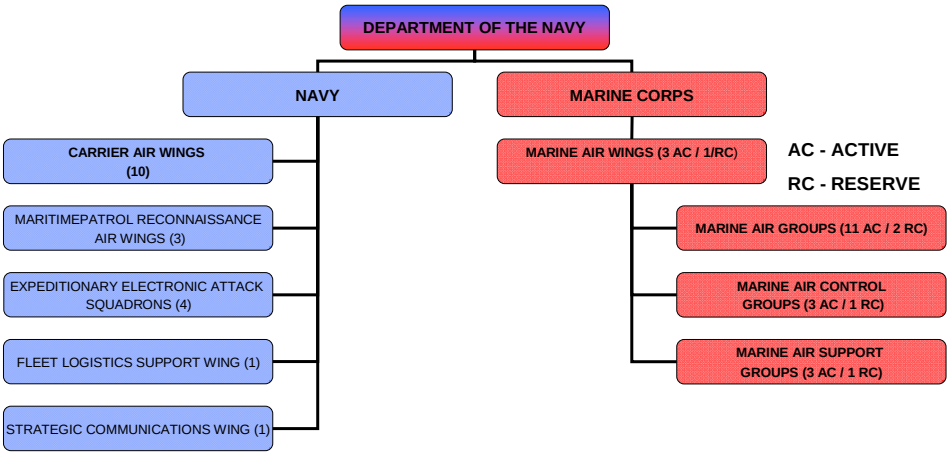
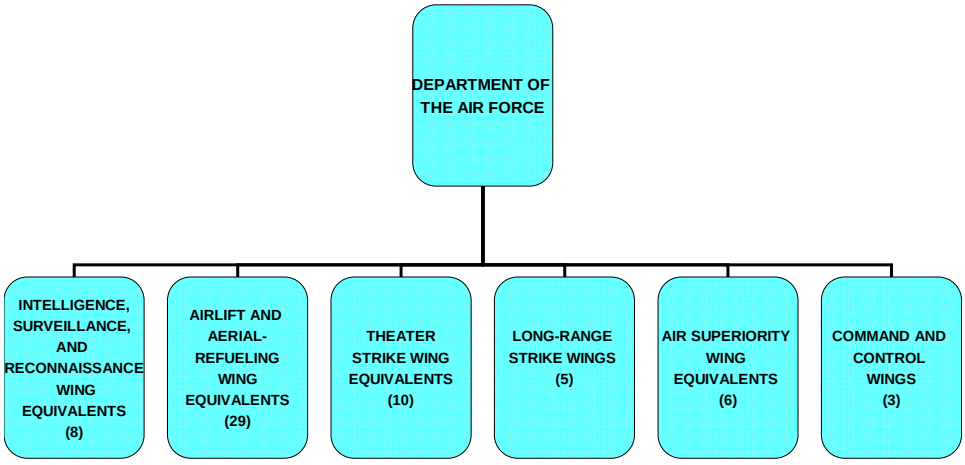


Chart 3. Department of Air Force Force Structure, FY 2011



Investment Objectives

In keeping with the Department's desire to provide a flexible and balanced force, the aviation plan provides the diverse mix of aircraft needed to carry out the six joint missions identified in the previous section. The capabilities provided by these aircraft correspond with four principal investment objectives that were implemented in the FY 2010 budget and are carried forward in the FY 2011 budget request and the FY 2011-2040 aviation plan:

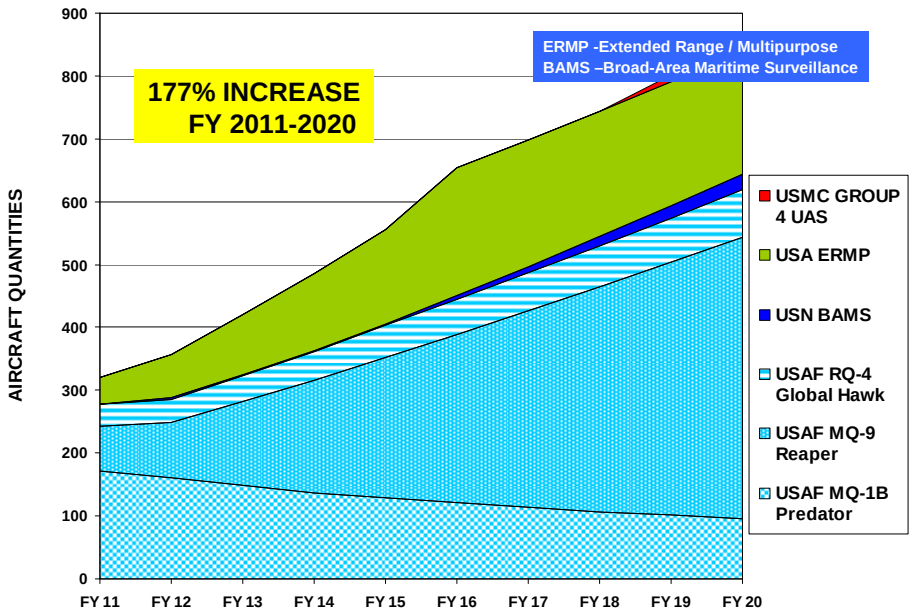
- Meet the demand for persistent, unmanned, multirole ISR capabilities;
- Provide sufficient enabler capability and capacity;
- Acquire fifth-generation fighter/attack aircraft; and
- Modernize long-range strike capabilities.

These objectives are discussed in more detail in the sections below.

Meet the demand for persistent, unmanned, multirole ISR capabilities. The aviation plan's emphasis on long-endurance, unmanned ISR assets—many with strike capabilities—is a direct reflection of recent operational experience and combatant commander (COCOM) demands. The number of platforms in this category—Global Hawk-class, Reaper, and Predator-class systems—will grow from approximately 300 in FY 2011 to more than 800 in FY 2020, including the Army's Extended-Range/Multipurpose (ERMP) unmanned aerial system (UAS) and the Navy's Broad-Area Maritime Surveillance (BAMS) UAS. This nearly 200 percent capacity increase is effectively multiplied by capability improvements afforded by the acquisition of vastly improved sensors and the replacement of Air Force Predators with more capable Reapers. The growth in ISR capacity also encompasses the Marine Corps' planned procurement of an expeditionary unmanned system capable of being operated and maintained from austere locations. Although the current plan calls for increases in Air Force unmanned Predator and Reaper platforms from a capacity of 50 orbits in FY 2011 to 65 by FY 2013, the Department is still assessing its capacity

requirements for these highly versatile aircraft. Chart 4 shows the significant growth in persistent, unmanned, multirole ISR assets projected over the next ten years.

Chart 4. Unmanned, Multirole, ISR Aircraft Inventory, FY 2011-2020



The substantial growth in ISR platforms represented above does not portray the full scope of the expansion of ISR capabilities that will occur in the near-term, as the surveillance platforms discussed here only include Groups 4 and 5. These two groups, which typically have longer endurance, higher speeds, and larger payloads, do not include the myriad of smaller systems procured or being procured by the services.[2]

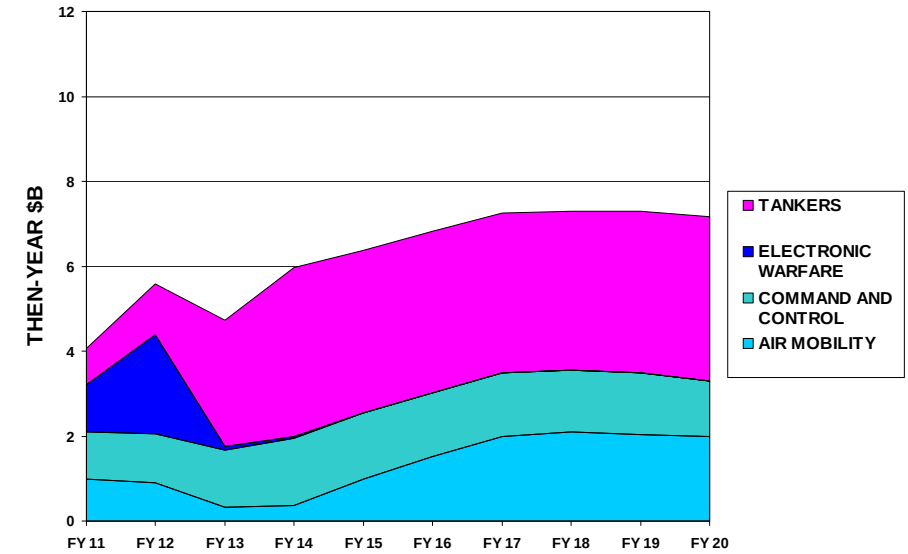
The cost (in both dollars and personnel) of expanding unmanned capacity and capability is not insignificant. The Department has balanced the need for these assets against manned aviation force structure and manpower demands, with a view toward providing the resources necessary to meet the demand for persistent, unmanned ISR/strike assets. The Department will continue to adapt the mix of unmanned and manned systems as security needs evolve.

Provide sufficient enabler capability and capacity. A second key priority is investing in aviation enablers, including air mobility assets (aircraft performing airlift or aerial-refueling missions, or both), electronic warfare platforms, and airborne early warning aircraft. Air mobility provides the nation the agility to deploy, employ, and sustain military power anywhere in the world, at a speed and tempo that adversaries cannot match. Electronic warfare aircraft deny situational awareness to opponents by jamming their radars and communications. Airborne early warning aircraft provide advance warning of approaching opponents, vector aircraft to attack opposing forces, and conduct area surveillance, intercept, search and rescue, communications relay, and strike/air traffic control missions.

[2] Group 4 UAS typically operate below 18,000 feet Mean Sea Level and do not exceed 1,320 lbs. Group 5 UAS typically operate above 18,000 feet Mean Sea Level and exceed 1,320 lbs

The airlift inventory is robust and stable. Both the Air Force and Navy are recapitalizing their intratheater lift inventories, and the Air Force continues to modernize the strategic lift inventory, which is projected to remain viable through the years covered by this plan. The Air Force is beginning recapitalization of the tanker fleet. It simultaneously is modernizing its fleet of E-3 airborne early warning aircraft and anticipates recapitalizing that fleet in the far term. The Navy is recapitalizing its airborne early warning fleet with aircraft carrying a new radar capable of operating in anti-access environments. The Navy is also recapitalizing its aged fleet of maritime patrol aircraft with a modern commercial aircraft and sensor suite that provides persistent undersea, anti-surface warfare, and ISR capabilities. This aircraft, the P-8, will be complemented in the maritime and littoral roles by the long dwell BAMS. The Navy will expand procurement of EA-18Gs to recapitalize expeditionary capabilities and is examining options for a new jamming system for use on the EA-18G, JSF, and unmanned platforms. Chart 5 shows the growth in aviation enabler investments through FY 2020.

Chart 5. Aviation Enabler Investments, FY 2011-2020



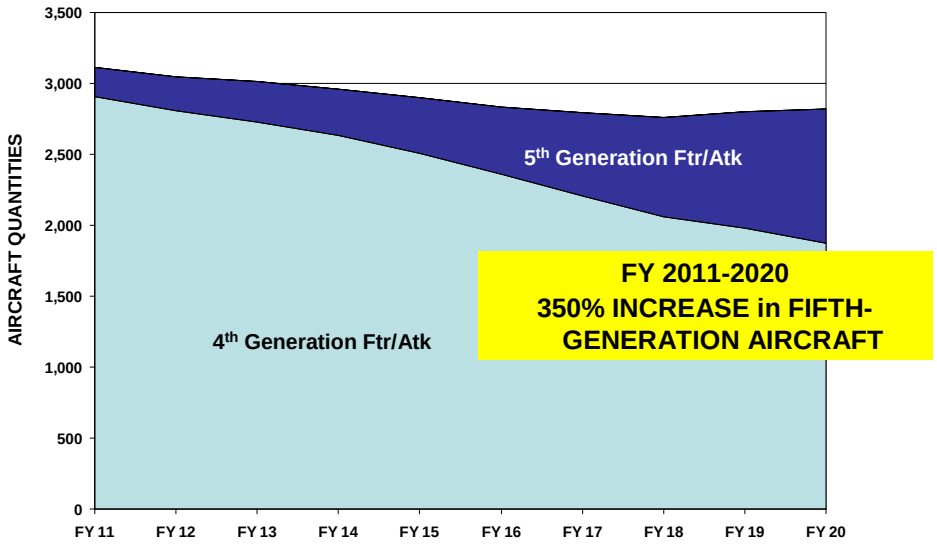
AIRCRAFT INCLUDED: KC-X, KC-130, EA-18G, E-2D, C-130J, C-27

Acquire fifth-generation fighter/attack aircraft. Fourth-generation fighter/attack aircraft are important today, as evidenced by their involvement in the current operations in Iraq and Afghanistan. However, the age and capability limitations of manned fourth-generation aircraft make them less valuable in the future, hence the Department's emphasis on fifth-generation and unmanned aircraft. The Department's fifth-generation assets will grow from about 7 percent of the current force of manned fighter/attack aircraft to about 34 percent by FY 2020, as shown in Chart 6. The JSF accounts for the bulk of DoD's fifth-generation force. The aviation plan reflects the restructured JSF program, incorporating the latest estimates of schedule and cost performance. The Air Force continues to modernize its fleet of F-22 aircraft, and the Navy is completing production of the fourth-generation FA-18E/F aircraft.

By FY 2040, almost all of today's "legacy" force will have retired and the Department will have begun recapitalization of the fifth-generation force. Far-term recapitalization plans cannot be defined with any degree of precision today, making projections of the fleet difficult beyond the

well-understood procurement plans for the JSF. The Department is continuing evaluations of projected threats and alternative means for defeating those threats. It is anticipated that a family of systems—mixes of manned and unmanned aircraft, with varying stealth characteristics, and advanced standoff weapons—will shape the future fighter/attack inventory. These tradeoffs are being examined now, and subsequent aviation plans will reflect the resulting acquisition decisions.

Chart 6. Fighter/Attack Aircraft Inventory, FY 2011-2020



Modernize long-range strike capabilities. The enduring need for long-range attack capabilities will be met by a family of systems. A study is underway to identify the right mix of manned and unmanned technologies that will provide future long-range strike capabilities and to determine the right balance between range, payload, speed, stealth, and on-board sensors.

One member of this family of systems is the existing manned bomber fleet, which will remain relevant through FY 2040. A product of the study will be the identification of a replacement aircraft for the aging aircraft in the legacy bomber fleet and the timing and funding profile required to support this aircraft.

Aircraft Investment Plan

Force-Wide Perspective. The Department's aviation inventory, broken out by category, is shown for each fiscal year through 2020 in Table 1. Total aviation force levels will remain fairly constant throughout the period, ranging from a low of about 5,300 in FY 2017 to a high of nearly 5,500 in FY 2020. The fighter inventory will decline slightly (a roughly 10 percent decrease), during the ten-year period, while aircraft in the multirole unmanned aerial system category will more than quadruple. These inventory trends are subject to change in response to operational needs, industrial base considerations, and fiscal constraints.

Table 1. Aviation Force Inventory, FY 2011-2020

INVENTORY	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
FTR/ATK	3,264	3,209	3,168	3,125	3,049	2,979	2,927	2,883	2,918	2,929
ISR/C2	580	555	554	554	527	511	505	526	537	542
MULTI-ROLE UAS	72	88	133	178	223	268	313	358	415	476
TANKERS	549	551	551	544	538	534	533	531	531	534
INTRALIFT	536	540	540	537	536	509	516	520	530	538
STRAT LIFT	313	312	312	312	312	312	312	312	312	312
BOMBERS	162	162	162	162	162	162	162	162	162	162
TOTAL	5,476	5,417	5,420	5,412	5,347	5,275	5,268	5,292	5,405	5,493

The aviation plan is fiscally prudent, reflecting 3 percent average annual real growth over the FY 2011-2020 period. Total aviation investments will amount to $268 billion across the period. In terms of annual funding levels, expenditures will rise from about $22 billion in FY 2011 to about $29 billion in FY 2020 (see Chart 7). (All costs are expressed in FY 2010 constant dollars.) The investment projections encompass engineering and manufacturing development and procurement funding for new platforms.[3] They do not include the considerable procurement funding devoted to upgrades of legacy assets. The Department's FY 2011-2015 FYDP reflects resources shown below for those years.

Chart 7. Total Aircraft Investments, FY 2011-2020

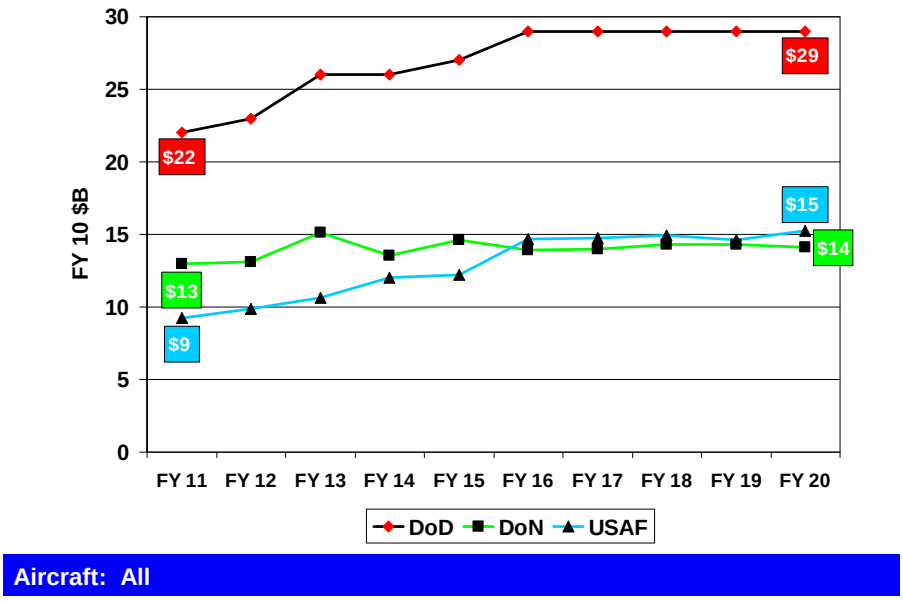
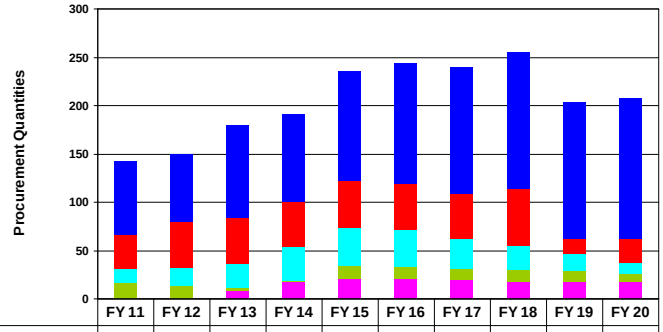


Chart 8 shows annual aircraft procurement quantities for the FY 2011-2020 period. Annual procurement levels will grow steadily through the mid-teens, fueled in particular by fighter,

[3] At the time this report was prepared, updated Selected Acquisition Report (SAR) data were not available. Thus, there could be discrepancies between the funding figures presented in this report and those provided in the SAR issued in April 2010.

ISR/C2 platform, and tanker purchases. Although the Department is spending considerable sums on modernizing legacy air mobility and long range strike platforms, there will be no new procurement of aircraft in these categories during FY 2011-2020. The picture will change in the 2020s, when the priority will likely shift to buying long-range strike and strategic lift aircraft.

Chart 8. Total Aircraft Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
Fighter/Attack	76	70	96	90	113	125	130	141	141	146
Unmanned Multirole Surveillance and Strike	36	48	48	48	48	48	48	60	16	24
ISR/C2	15	19	25	34	40	38	31	24	17	12
Intra-theater Lift	16	13	2	2	13	12	12	12	12	8
Strategic Lift	0	0	0	0	0	0	0	0	0	0
Tanker	0	0	9	17	21	21	19	18	18	18
Bomber	0	0	0	0	0	0	0	0	0	0

Aircraft: All

Investment Plans by Aircraft Category. This section describes the planned investments by the Departments of the Air Force and Navy in each of the seven categories of fixed-wing aircraft.

Fighter/Attack Aircraft

Department of the Air Force. Over the next ten years, the Air Force will ensure that the F-22 remains the premier air-to-air fighter aircraft by spending $1.9 billion on modernization. Procurement dollars will be focused on the JSF, which provides the advanced sensor capabilities and stealth features needed for the future. Because the investment plan incorporates the restructured JSF program, it reflects the resulting delay in procurement in the early portion of the period. This restructured program assumes continued commitment from program participants. Future research and development efforts beyond the FYDP will focus on follow-on capabilities to the F-22 Raptor. A successor aircraft would be needed about 2025.

In the far term, the Air Force will retire its fourth-generation fighter/attack fleet. In evaluating replacement options, it will consider both manned and unmanned options.

Department of the Navy. The Navy will continue procuring the fourth-generation F/A-18E/F Super Hornet through FY 2013, when production of the JSF carrier variant should begin to ramp up. The Super Hornet provides a significant increase in combat radius, endurance, and weapons payload over the legacy F/A-18A-D fleet. Procurement of the EA-18G Growler will end in FY

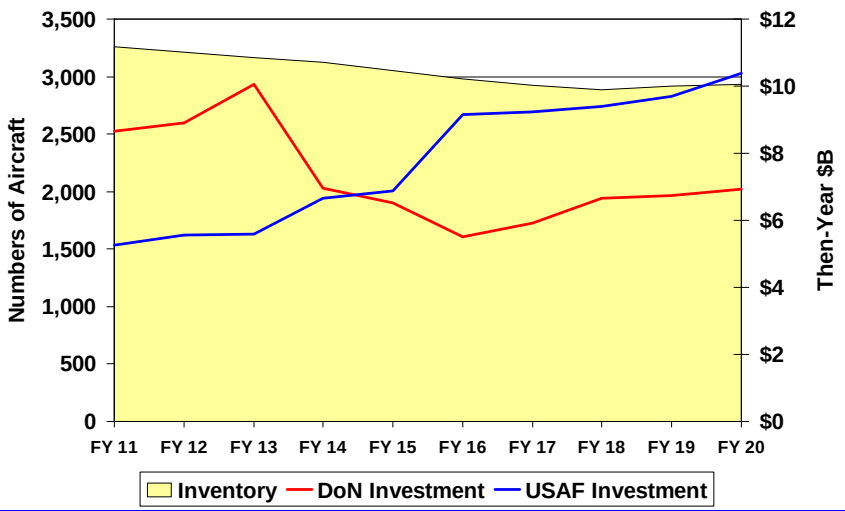
2013, when the inventory objective is reached. Though it is an electronic warfare platform, the EA-18G has parts and manufacturing commonality with the F/A-18E/F, so it is included in the fighter category. The EA-18G aircraft will replace Navy EA-6B Prowlers, filling a critical niche in aviation warfare.

While the Marine Corps has continued to modernize its fleet of F/A-18s, it has made the decision to skip further procurement of fourth-generation fighter/attack aircraft and procure the JSF. The Corps is at the front of the JSF buy and will achieve initial operating capability (IOC) in 2012 in the F-35B. The Navy's version of the JSF, the F-35C, will begin full rate production in 2015. The delay in delivery of the JSF has been addressed by the Department of the Navy through changes in force structure, concepts of operation, and extension of the F/A-18 production line through 2013.

In the far term, the Navy will need to replace its F/A-18E/F fleet. The Navy is starting to conduct analyses to inform a decision on a follow-on system. Options include replacing the F/A-18E/F with F-35 aircraft or developing a new manned or unmanned platform or a combination of both.

Chart 9 depicts annual Navy and Air Force fighter/attack aircraft investment funding and inventory levels during FY 2011-2020. In the aggregate, the fighter/attack inventory will decline by 10 percent over that period, while becoming considerably more modern. That trend reflects ongoing and planned efforts to retire fourth-generation fighter aircraft in order to achieve the critical capabilities provided by fifth-generation fighters and unmanned multirole ISR platforms. The Department of the Navy's investments in fighters will decline between FY 2013 and FY 2016 as it transitions from funding the F/A-18E/F/G and JSF to solely buying the JSF. Air Force JSF procurement will ramp up during this same period, as the maximum production rate of 80 aircraft per year is achieved. The Services have a number of options in managing the downward trend in their fighter/attack inventories. Mitigating steps include service-life extension programs to prolong the use of existing aircraft, along with organizational structure and concept of operations changes to achieve efficiencies with existing units.

Chart 9. Fighter/Attack Inventories and Investments, FY 2011-2020



Aircraft*: A-10, AV-8, EA-6B, EA-18G, F-15, F-16, F-18, F-22, F-35, F-X

***In all subsequent inventory and investment charts, the investment dollars are for new weapon systems only. Inventory quantities contain both new and legacy platforms specific to each category.**

Unmanned Multirole, Surveillance and Strike Aircraft

Department of the Air Force. In the near term, the Air Force will continue to procure MQ-9 Reapers. This unique platform, capable of carrying guided munitions, is an outstanding ISR asset with precision strike capabilities. The number of MQ-1 and MQ-9 orbits will increase from a capacity of 50 in 2011 to 65 by 2013. The planned incorporation of the Wide-Area Aerial Sensor (WAAS) will give the MQ-9 a marked increase in capabilities by enlarging the optical field-of-view and allowing for greater area coverage. In addition, the Department is beginning efforts to add electronic warfare capabilities to the MQ-9. The increase in orbits is complemented by recent MC-12W ISR procurement.

The far term will see the Air Force examining potential follow-on platforms to the MQ-9. Analyses will determine the capabilities and quantities needed for a successor system.

Department of the Navy. Over the next ten years, Navy investment will focus on accelerating the development of a carrier-based unmanned aircraft. The Unmanned Combat Aircraft System – Demonstration (UCAS-D) will accelerate the development of a carrier-based, unmanned aircraft, and moves towards a planned demonstration of carrier suitability in 2013. A sizable investment, ramping up to approximately $7 billion in FY 2020, is directed towards the development of a multirole unmanned platform. The Navy is conducting analysis to determine key capabilities for this future, sea-based unmanned aerial system (CVN UAS). Options cover a wide range, to include a high endurance ISR/strike platform for irregular warfare and a stealthy aircraft to defeat advanced air defenses.

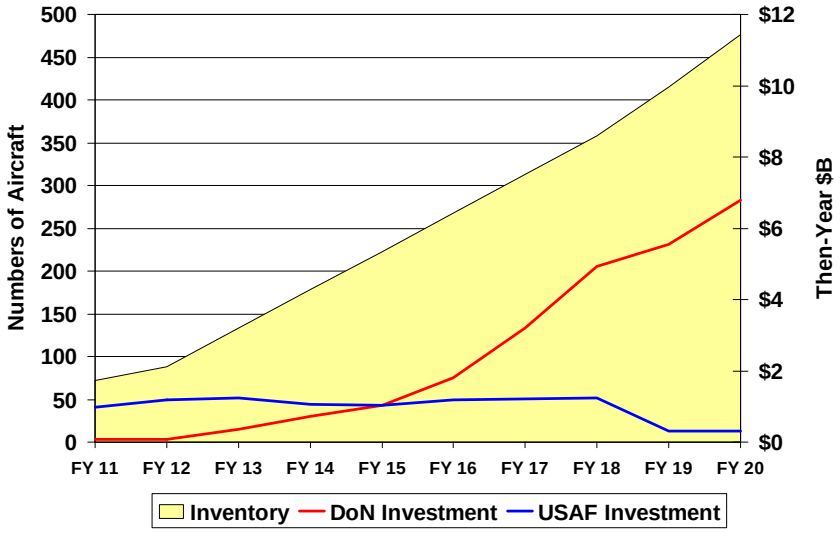
Additionally, the Marine Corps plans to increase existing unmanned aerial system (UAS) capabilities by fielding a multirole, Group 4 UAS in the FY 2018 timeframe. This expeditionary

platform will provide Marine Air Ground Task Forces with enhanced surveillance and strike capabilities.

In the long term, the Department of the Navy will capitalize on UCAS-D and its analysis of a future, sea-based unmanned system and will continue to examine the appropriate mix of manned and unmanned assets.

Chart 10 depicts the sharp growth in the unmanned multirole surveillance and strike inventories through FY 2020, along with the investments planned in this area during FY 2011-2020.

Chart 10. Unmanned, Multirole, Surveillance and Strike Inventories and Investments, FY 2011-2020



Aircraft: MQ-9, CVN UAS, USMC GROUP 4 UAS

ISR/C2 Aircraft

Department of the Air Force. In the near term, the Air Force will procure 39 RQ-4 Global Hawks through 2018. Through the innovative use of synthetic aperture radar and electro-optical and infrared sensors, Global Hawk provides the warfighter unrelenting observation of intelligence targets in the night, during the day, and in adverse weather conditions. The Air Force is modernizing its legacy C2 fleet but is currently assessing alternatives with regard to procuring any new platforms in the future.

Far-term efforts will include the potential recapitalization of the Air Force's ISR and C2 fleets. The E-3 Airborne Warning and Control System (AWACS), RC-135 Rivet Joint ISR aircraft, and E-8 Joint Surveillance Target Attack Radar System (JSTARS) aircraft will all reach the end of their service lives prior to FY 2040. It is possible that advances in UAS designs will allow unmanned systems to replace those aircraft.

Department of the Navy. Leveraging Global Hawk technology, the Navy will procure the BAMS aircraft to enhance situational awareness and shorten the time it takes to prosecute targets.

BAMS will complement other platforms by providing very long dwell ISR capabilities for missions in littoral and maritime areas.

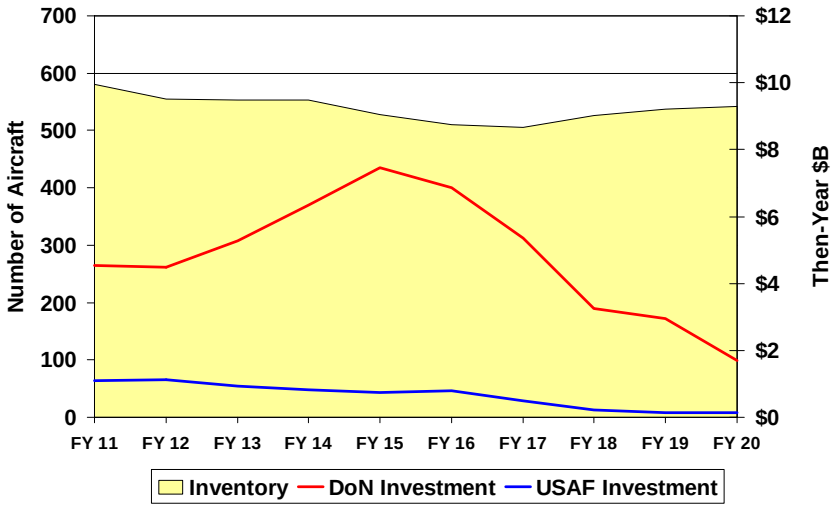
The P-8A Poseidon will replace the P-3C maritime patrol aircraft, first introduced in 1969. With its modern, capable sensors and robust communications, the P-8A will provide persistent undersea and anti-surface warfare capabilities as well as ISR and will be complemented by the long dwell ISR capability of BAMS.

The E-2D Hawkeye will replace the E-2C. Incorporating an advanced radar and other enhanced systems, the E-2D will improve open-ocean surveillance capability and provide littoral surveillance and theater air and missile defense capabilities against emerging air threats. The E-2D can operate effectively in stressing environments characterized by high clutter, electromagnetic interference, and jamming.

Over the long-term, the Navy will examine alternatives for recapitalizing the E-2D, P-8A, BAMS, and EP-3 fleets. Options include manned and unmanned systems as well as sensor upgrades for existing aircraft.

Chart 11 shows annual ISR/C2 investments and inventories through FY 2020. Procurement of the P-8A drives the increase in Department of the Navy funding, peaking in FY 2015.

Chart 11. ISR/C2 Inventories and Investments, FY 2011-2020



Aircraft: BAMS, E-2, E-3, E-4, E-8, MQ-1, P-3, P-8, RC-12, RC-135, RQ-4

Intratheater Lift Aircraft

Department of the Air Force. In the near term, the Air Force will continue procurement of the C-130J Hercules. The C-130J provides major improvements in fuel efficiency, range, altitude, digital avionics, and mission computers over legacy versions. An extremely versatile aircraft, the C-130J is capable of performing intratheater lift missions in austere locations, as it is doing

today in Afghanistan and Iraq. Complementing the C-130J, the C-27 is a light transport aircraft that will be used to deliver supplies to U.S. combat forces near or in battle zones. It will be capable of carrying both cargo and passengers and of operating from unimproved surfaces

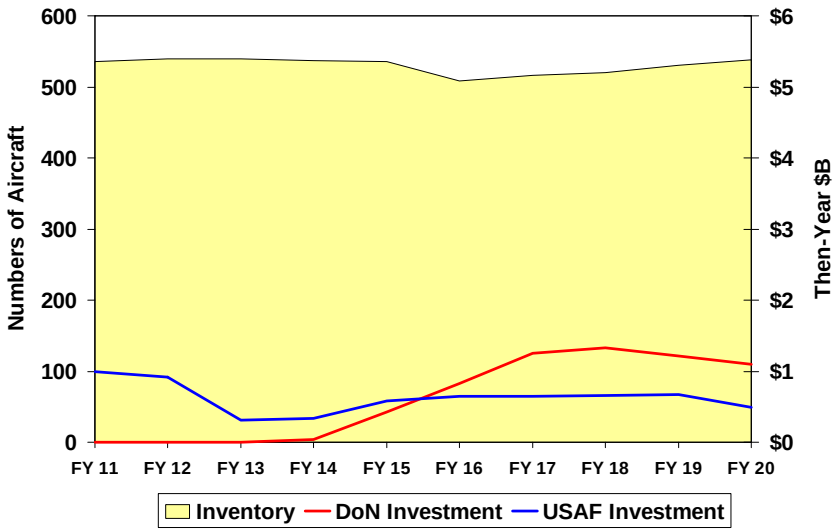
For the far term, the Air Force is investigating options for meeting future intratheater lift needs, including potentially the acquisition of a family of airlift systems that would provide complementary capabilities with respect to maneuverability and sustainability.

Department of the Navy. Over the next ten years, the Navy will procure C-130J and C-40 lift aircraft.

In the far term, the C-2A fleet, which provides long-range logistical support to carrier strike groups, will reach the end of its service life and will have to be replaced. C-40A aircraft, being procured in the near term, will begin reaching the end of their service lives prior to 2040 and will need to be replaced.

Chart 12 shows annual intratheater lift investments and inventories through FY 2020. The decline in funding for these assets, specifically for the C-130J, in FY 2013 and 2014 will not negatively impact the industrial base because of other ongoing aircraft production efforts, such as the Marine Corps' KC-130J tanker procurement program. Combined with foreign military sales, U.S. purchases of intratheater transport aircraft will ensure a steady production ramp for the industrial base.

Chart 12. Intra-Theater Lift Inventories and Investments, FY 2011-2020



Aircraft: C-2, C-27, C-40, C-130, JFTL

Strategic Lift Aircraft

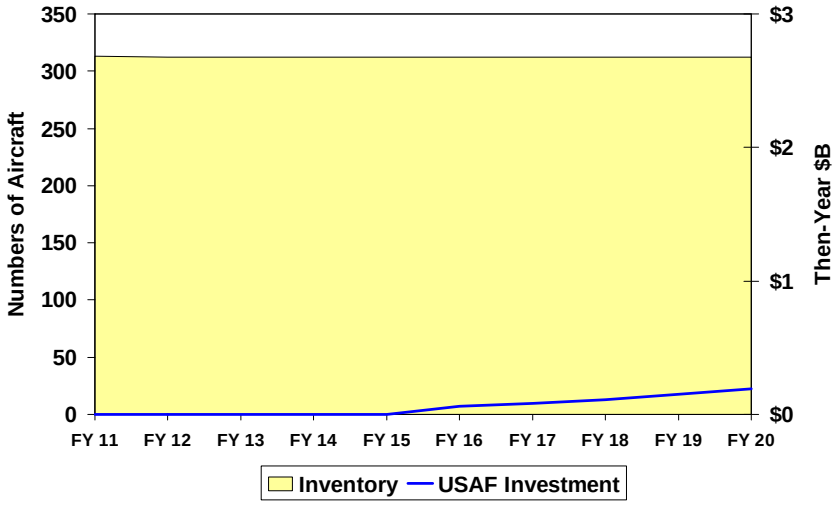
Department of the Air Force. In combination with commercial aircraft that can be made available for airlift missions and sealift forces, the Air Force's strategic airlift aircraft—the C-17 and C-5—form the foundation of the nation's strategic mobility and global sustainment

capabilities. To maintain their operational capability and transport capacity, all C-5s will receive an avionics upgrade. Additionally, 52 C-5 aircraft will undergo engine upgrades, further extending their service lives.

The C-5 Galaxy and C-17 Globemaster III fleets will continue to form the core of the military's strategic airlift capabilities in the far term. Continued investments in upgrades for these fleets remain the most cost-effective means of sustaining these capabilities through 2040. Additionally, the Department will likely program funds to develop a future strategic airlifter to replace the C-5 as it approaches the end of its service life.

Chart 13 shows annual strategic lift investments and inventories through FY 2020. The investment increases in the latter half of the decade reflect the anticipated development of a follow-on to the C-5.

Chart 13. Strategic Lift Inventories and Investments, FY 2011-2020



Aircraft: C-5, C-17, C-X

Aerial-Refueling Tanker Aircraft

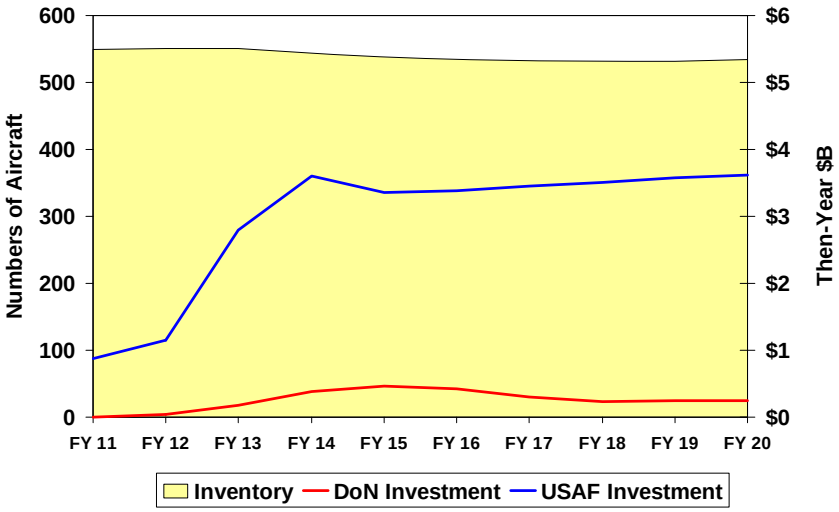
Department of the Air Force. As the Air Force's fleet of tanker aircraft ages, new tankers will be needed to provide in-flight refueling support for U.S. military aircraft and for aviation forces of coalition nations. The Air Force plans to develop and procure 109 new KC-X tankers by 2020. It will be able to refuel other aircraft in flight, and be refueled itself while airborne, transferring fuel to either boom or drogue receivers without having to be reconfigured for those deliveries in advance.

Over the longer term, the Air Force will evaluate options for recapitalizing its tanker fleet and assess the potential of including secondary capabilities, such as airlift, communications support, and aeromedical evacuations.

Department of the Navy. The Marine Corps will continue procuring the KC-130J in the near term, expanding its inventory of this aircraft, which has proven its combat effectiveness and reliability in both Iraq and Afghanistan. Capable of employment in both intratheater lift and aerial refueling missions, the KC-130J will replace aging KC-130T models.

Chart 14 shows annual tanker investments and inventories through FY 2020. The KC-X program accounts for the steep increase in investments during FY 2011-2014.

Chart 14. Aerial-Refueling Tanker Inventories and Investments, FY 2011-2020



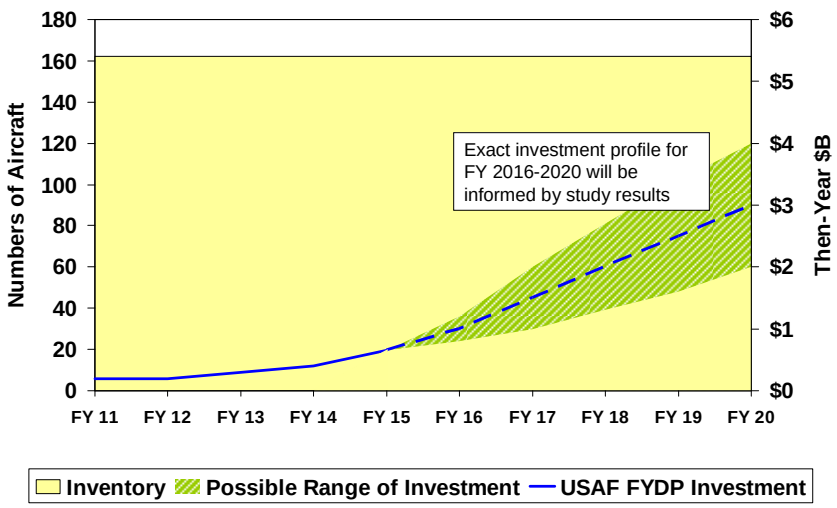
Aircraft: KC-10, KC-130, KC-135, KC-X

Bomber Aircraft

Department of the Air Force. As the Department modernizes the existing bomber fleet to provide survivable long-range strike capability, simultaneous investments in EMD for a follow-on bomber will be required. These investments, supporting a larger, global strike portfolio, will ensure the introduction of a new, affordable bomber prior to the retirement of the current force. Although the characteristics of the next long-range strike aircraft have not yet been determined, one option under consideration is a survivable, penetrating aircraft with better stealth capabilities than current aircraft have, possibly incorporating advanced sensors of the type previously reserved for ISR aircraft. Range and payload requirements for a successor system are still under investigation.

Chart 15 shows annual bomber investments and inventories through FY 2020. Investment funding beyond FY 2015 for a follow-on bomber is currently unknown. The Department is studying multiple long-range strike options spanning a wide range of investment outcomes. The uncertainty in funding is indicated by the shaded area on the graph. The curve inside the shaded area shows a new bomber investment profile consistent with a DoD aircraft investment that averages 3 percent annual growth. Spending above the curve would require even greater funding growth or would entail making commensurate reductions in other programs. The curve was used in building the total aircraft investment (Chart 7).

Chart 15. Bomber Inventories and Investments, FY 2011-2020



Aircraft: B-1, B-2, B-52, Long-range persistent strike platform (LRPS)

Budget Certification

The Department's FY 2011 budget request and the associated FY 2011-2015 FYDP provide the requisite funding to implement the aviation investment plan through FY 2015.

Sufficiency of Forces Assessment

The FY 2011-2040 aviation plan is consistent with the tenets of the 2010 Quadrennial Defense Review and meets the national security requirements of the United States.

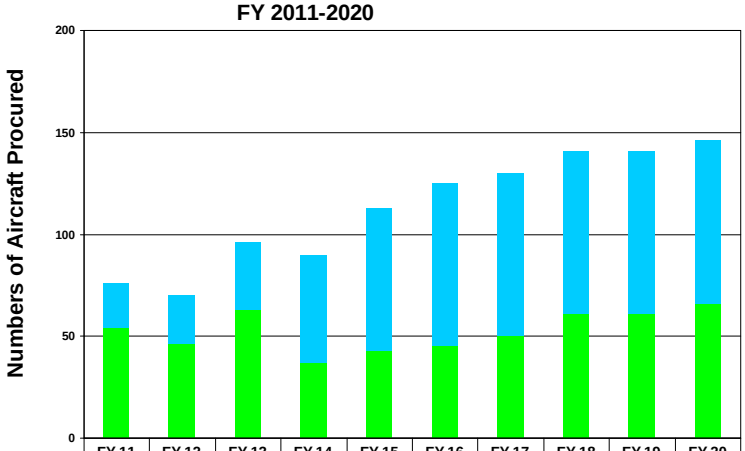
Plan for Aircraft Investment for FY 2011

Part III –Appendix

Aircraft Procurement Displays

Charts showing annual procurement levels for Department of Air Force and Navy aircraft are provided below. As with the companion displays in the body of the report, the charts presented here cover the period FY 2011-2020. Charts are provided only for those mission categories for which aircraft will be procured during the FY 2011-2020 period. Accordingly, displays are not presented for categories in which investments will focus exclusively on research and development activities.

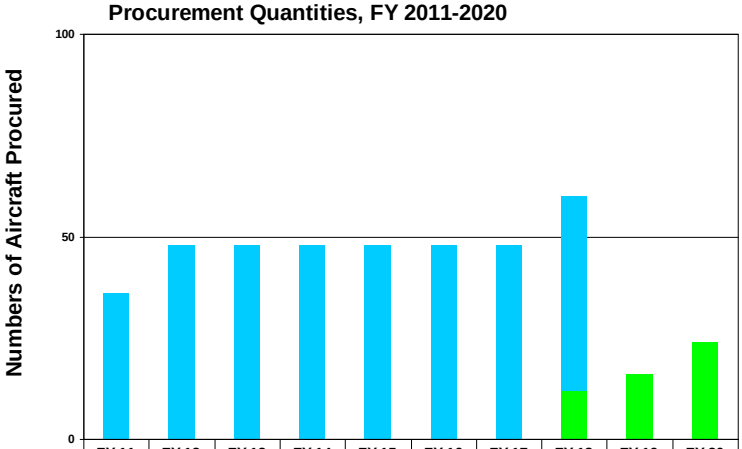
Appendix Chart 1. Fighter/Attack Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
USAF Procurement	22	24	33	53	70	80	80	80	80	80
DoN Procurement	54	46	63	37	43	45	50	61	61	66

Aircraft: F/A-18E/F, EA-18G, F-35A/B/C

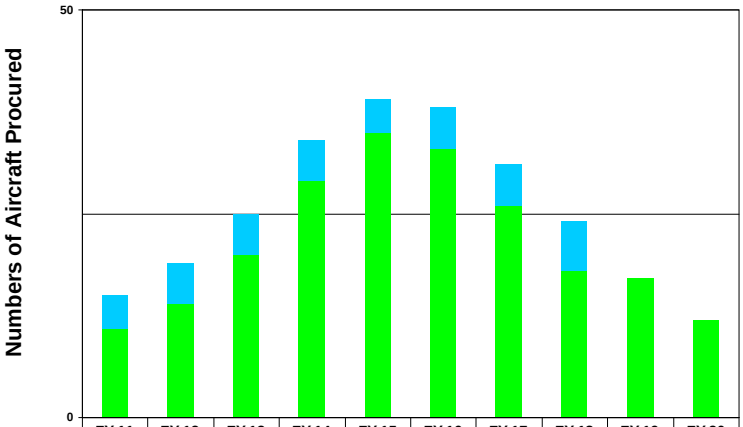
Appendix Chart 2. Unmanned, Multirole, Surveillance and Strike Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
USAF Procurement	36	48	48	48	48	48	48	48	0	0
DoN Procurement	0	0	0	0	0	0	0	12	16	24

Aircraft: MQ-9, USMC Group 4 UAS

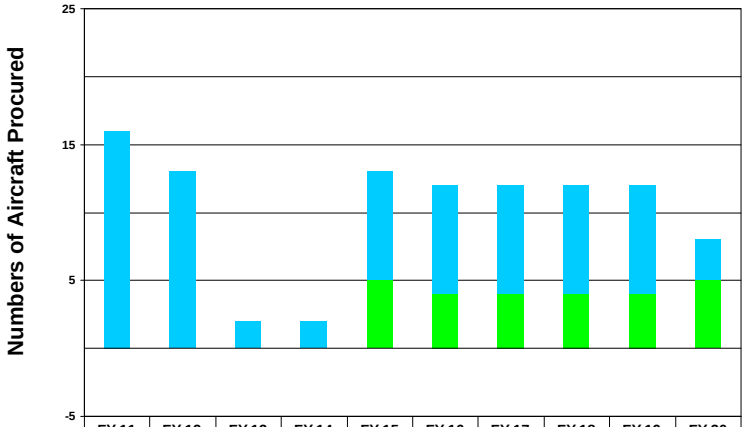
Appendix Chart 3. ISR/C2 Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
USAF Procurement	4	5	5	5	4	5	5	6	0	0
DoN Procurement	11	14	20	29	35	33	26	18	17	12

Aircraft: RQ-4, E-2D, P-8

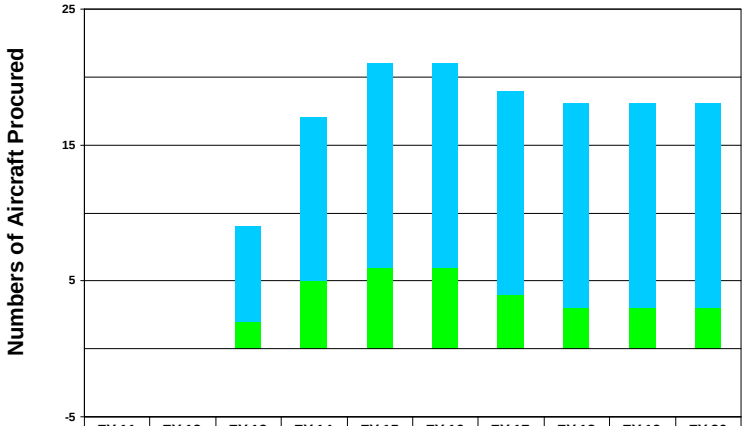
Appendix Chart 4. Intratheater Lift Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
USAF Procurement	16	13	2	2	8	8	8	8	8	3
DoN Procurement	0	0	0	0	5	4	4	4	4	5

Aircraft: C-130J, C-27, C-40,

Appendix Chart 5. Tanker Procurement Quantities, FY 2011-2020



	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
USAF Procurement	0	0	7	12	15	15	15	15	15	15
DoN Procurement	0	0	2	5	6	6	4	3	3	3

Aircraft: KC-X, KC-130