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October 14, 2003

The Honorable John Warner  
Chairman  
The Honorable Carl Levin  
Ranking Member  
Committee on Armed Services  
United States Senate

Subject: *Military Aircraft: Observations on DOD's Aerial Refueling Aircraft Acquisition Options*

During the Senate Armed Services Committee's September 4, 2003 hearing on the Department of Defense's (DOD) proposed lease of 100 Boeing KC-767A aerial refueling aircraft, you expressed concern about a significant "bow-wave" funding requirement in future years to pay for leasing and then buying these 100 aircraft at the end of their leases, while continuing efforts to modernize the remainder of the tanker fleet. Subsequently, you requested that DOD analyze the option of leasing 25 aircraft, followed by a procurement of the remaining 75 aircraft. The Deputy Secretary of Defense responded to your request on September 22, 2003, identifying several alternative acquisition strategies, with associated cost and savings estimates. On September 25, 2003, you asked that GAO review the DOD response and assess the validity of the department's assumptions and the accuracy of the cost and savings estimates, and identify any other alternative acquisition strategies that the Committee should consider. This letter responds to your request.

DOD's response compared the six acquisition options offered by the Deputy Secretary to acquire 100 KC-767A aircraft: (1) leasing all 100 aircraft as outlined in the Air Force plan reported to the Congress in July 2003; (2) purchasing all 100 aircraft at the time of order under the same multiyear conditions as the lease; (3) leasing the first 25 aircraft and purchasing the remaining 75 when the order is placed; (4) leasing the first 25 aircraft and purchasing the remaining 75 when the aircraft are delivered; (5) leasing 25 aircraft, followed by a traditional multiyear procurement of 75 aircraft under a separate contract, and (6) leasing all

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100 aircraft initially, then planning to seek \$2.4 billion between fiscal years 2008-2010 to purchase 26 of the 100 aircraft.<sup>1</sup>

To perform our work, we met with DOD and Air Force officials to obtain details on these options, including the assumptions and information used to generate the cost and savings estimates contained in DOD's response. We also conducted our own independent analysis. See enclosure I for more details on our scope and methodology.

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## Summary

In our opinion, the assumptions used by DOD to develop its analysis of acquisition options generally appear to be reasonable, and the computations of the cost and savings estimates associated with these options appear to be accurate based on the current terms and conditions of the negotiated lease. We do believe, however, that the costs and savings numbers could be further refined under the options involving purchase. For example, Air Force officials indicated that The Boeing Company would pay the cost to underwrite the issuance of the bonds needed for financing in the original lease option. However, they could not definitively say whether the underwriting costs were included in the \$131 million price for each aircraft. Because fewer bonds, if any, would be issued under the options involving purchase, the costs should be lower and the savings higher.

With the exception of the fifth option—Chairman Warner's suggestion of leasing 25 aircraft, followed by a purchase of the remaining 75 aircraft at delivery—DOD did not significantly deviate from the costs, schedules, and support provisions contained in its July 10, 2003 report to the Committee and the Congress. Air Force officials stated that their analysis of options complied with the Chairman's request and that analyses outside the proposed lease's terms and provisions would be academic exercises that might not be representative of the final negotiated prices. These officials also stated that changes from the proposed contract would require new negotiations and new review and approval actions, and consequently would lead to additional delays.

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<sup>1</sup> Figures 4 and 5 of the Deputy Secretary's letter also mentioned another version of this—to identify \$2 billion in fiscal year 2008-2009, but this option was not discussed in the narrative of the letter.

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In addition to the options presented by DOD, we believe two other possible approaches—lease fewer tankers or purchase tankers on a slower schedule—may be of interest to the Congress. Both options would involve fewer than 100 aircraft—one through leasing and one through direct purchase. Both options have advantages and disadvantages that we have not fully explored in the time available.

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## Our Assessment of DOD's Analysis

In our opinion, the assumptions used by the DOD to develop its analysis of acquisition options generally appear to be reasonable, and the computations of the cost and savings estimates associated with these options appear to be accurate based on the current terms and conditions of the negotiated lease. Table 1 summarizes DOD's estimated costs and savings for the six options it considered, followed by our observations on the approach, data, and assumptions used. As indicated in table 1, the current proposal being considered by the Congress for the Air Force—the lease of 100 KC-767A aircraft for 6 years each, followed by their purchase at the end of the lease—is the most costly of the options over the next decade, requiring about \$29.8 billion (then-year dollars). As we have testified,<sup>2</sup> leasing requires the least up-front funding to the 2004-2009 Future Years Defense Program (FYDP), about \$5.5 billion (then-year dollars). While purchase of the 100 aircraft would cost the least amount over the long term—\$24.3 billion, or \$5.5 billion less than the lease, it would require the largest up-front increase to the FYDP—nearly \$13 billion more than the lease option. DOD approved the lease proposal, at least in part, because it requires the least amount of up-front funding for refueling aircraft while keeping the funding for other programs intact.

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<sup>2</sup> *Military Aircraft: Observations on the Proposed Lease of Aerial Refueling Aircraft by the Air Force.* GAO-03-923T. Washington, D.C.: September 4, 2003.

**Table 1: Options and Cost Comparisons (then-year dollars in billions)**

Options	Cost during FYDP <sup>a</sup>	Total costs <sup>b</sup>	Savings over current lease proposal
1. Lease 100	5.5	29.8	NA
2. Purchase 100	18.4 <sup>c</sup>	24.3 <sup>c</sup>	5.5
3. Lease 25/buy 75, pay when order	16.6	25.6	4.2
4. Lease 25/buy 75, pay at delivery	10.1	26.3	3.5
5. Separate contracts (lease 25, buy 75)	16.0	27.1 <sup>c</sup>	2.7
6. Lease with \$2.4 billion increase	7.5	28.6	1.2

Source: GAO analysis of Air Force data.

<sup>a</sup>Aircraft cost only. Includes cost of purchasing leased aircraft at end of lease.

<sup>b</sup>Includes operating and support costs, other government costs, and military construction.

<sup>c</sup>Assumes that multi-year procurement authority was granted.

We have the following comments and observations on DOD's options:

- The estimated costs and savings for all options except for number 5 are based on the cost figures from the currently negotiated lease with Boeing. Based on our analysis, we believe these represent a reasonable estimate of the likely total costs and savings in then-year dollars. We do think, however, that the costs and savings numbers could be further refined in the options involving purchase or lease. For example, Air Force officials indicated that The Boeing Company would pay the cost to underwrite the issuance of the bonds in the original lease option. However, they could not definitively say whether the underwriting costs were included in the \$131 million price for each aircraft. Because fewer bonds, if any, would be issued under the options involving purchase, the costs should be lower and the savings higher.
- The fifth option entails a contract for leasing 25 aircraft followed by a separate contract for a traditional multi-year procurement. With this option, Air Force officials stated that the capital markets may not support the lease because of risk concerns, particularly in exercising the option to buy the planes at the end of the lease, and, therefore, the option is potentially unexecutable. In examining this concern, we would point out that 90 percent of the present value of the fair market value of the aircraft will have been paid at the end of their 6-year leases, and it would make little sense not to purchase the planes. Also, given the long-term need to replace the tanker fleet, it is unlikely that the planes would not be purchased at the end of the lease.
- All of the options except for number 5 assume delivery of 60 aircraft during the FYDP period on the same delivery schedule. DOD believes

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option 5 would require new negotiations, internal and external review, and congressional approval—a process that could take as long as a year and could result in higher prices than currently negotiated for the lease of 100 aircraft. Because of this potential delay, DOD also estimates that this option would result in delivery of only 40 aircraft during the FYDP period. Based on our analysis, we believe the costs and savings estimates by the Air Force are more speculative for this option. It is unclear to us why the process to negotiate and process the changes would take so long to gain final approval. Also, any purchase of the aircraft, including those specified in each of the other options, required congressional approval.

- As presented by DOD, all the options considered represent a trade-off between more up-front budget authority during the FYDP period and more potential savings over the life of the program.
- All of the options except for number 5 assume the same early delivery schedule as the currently proposed lease; that is, the first 4 aircraft would be delivered at the end of fiscal year 2006, 16 in 2007, and 20 per year in subsequent years until 100 have been delivered. This assumes that it is more urgent to begin replacement of the tanker fleet now rather than proceed with the previously planned procurement schedule, which the Air Force has said would begin delivering aircraft in fiscal year 2009.
- DOD was not asked to and did not assess other options outside the terms and provisions of the existing lease, which could potentially provide additional cost savings. For example, what costs and savings might accrue if the number of KC-767A aircraft leased and/or procured varied from 100 aircraft? How would competitive bidding by commercial airlines and independent maintenance, repair, and overhaul facilities for KC-767A maintenance and training support affect costs and savings? How would program costs change if the purchase price per plane was closer to the \$120.7 million estimate postulated by the Institute for Defense Analyses, rather than the \$131.0 million price contained in the contract?<sup>3</sup>
- The Deputy Secretary's letter presenting the Air Force savings estimates states that the department proposes to find an extra \$2.4 billion to buy out the leases for 26 aircraft in the 2008-10 timeframe. Air Force officials told us that DOD will try to identify these funds in the current FYDP and may even seek support from the Army, Navy, and Marine Corps. This is option number 6 in the table. DOD and Air Force acquisition officials we spoke with said that the Deputy Secretary of Defense's letter to the committee represents a firm commitment to identify these funds in the fiscal year

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<sup>3</sup>At your request, we reviewed the Institute of Defense Analyses study and concluded that its methodology was reasonable. See *Military Aircraft: Institute for Defense Analyses Purchase Price Estimate for the Air Force's Aerial Refueling Aircraft Leasing Proposal*. [GAO-04-164R](#). Washington, D.C.: October 14, 2003.

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2008-2010 time frame. If the Congress agreed to that approach, it might want more assurance that the increase in funding would really occur, otherwise the savings will not materialize and the Congress may simply be asked to provide additional budget authority.

The initial 100 KC-767A aircraft being discussed represent only about 20 percent of the KC-135 inventory. DOD and the Air Force have stated that tanker replacement efforts need to continue beyond these aircraft, and that this will be an expensive and lengthy undertaking. As a result, the funding requirements for tanker replacement will extend for many years beyond those addressed in the lease proposal, and will have to compete with other high priority programs among the Air Force and the other services in a fiscally-constrained environment. Thus, the Committee's concern about a tanker "bow wave" is appropriate and relevant as we pointed out in our September 4, 2003 testimony, regardless of the option chosen for the first 100 aircraft. The options involving a 25/75 split of leased and purchased aircraft all have a positive effect on the "bow wave" concern beyond fiscal year 2012, as was discussed at the September 4, 2003 hearing. By committing more funding in the early years of the program, costs are reduced considerably in the out years. This should ease the burden on budgets for follow-on procurements of tanker aircraft. The proposal to plus up the budget by \$2.4 billion to buy out 26 of the leases also has a positive effect on reducing the bow wave, but not to as great an extent as the other options. This approach still incurs costs in the \$3 billion range in fiscal year 2011-13. To illustrate the effect of DOD's various options on this long-term spending picture, we have developed charts showing the budget authority that would be required to execute the acquisition of the first 100 aircraft followed by a subsequent purchase of another 100 KC-767A aircraft. (See enclosure II).

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## Other Alternative Approaches

The DOD response represents a reasonable analysis of the 25/75 split option and it offers an additional option—option number 6, which proposes to add \$2.4 billion for tankers to be used to buy out leases for 26 aircraft. In effect, this would be a "lease 74/buy 26" approach. We believe at least two additional options may be of interest to the committee as it considers its decision. These include the following:

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- **Lease fewer tankers.** Section 8159 of the 2002 Act<sup>4</sup> authorized a pilot program for leasing no more than 100 Boeing 767s as tankers. The act did not specify leasing 100; it set 100 as the maximum. A smaller leasing program would still meet the intent of the act, would be less expensive, would start replacement of the KC-135s, and most importantly, would allow some time for the Air Force to study tanker force requirements and conduct a thorough analysis of alternatives before committing to a large acquisition program.<sup>5</sup> Such an approach would probably need to include leasing as many as 40 to 50 aircraft to provide sufficient time for the needed studies. This approach is still more expensive than purchase, and it might still involve the use of the special purpose entity<sup>6</sup> to facilitate lease financing, but it allows the program to proceed with early delivery of aircraft without disruption to Air Force budgets in the short-term. We do not know what effect this approach would have on delivery schedules or whether Boeing would agree to the same lease terms for fewer aircraft.
  - **Purchase tankers on a slower schedule.** The Air Force plans to spend about \$5.5 billion during the FYDP period for the proposed lease, and the Deputy Secretary stated in his letter to you that the department proposes to identify an additional \$2.4 billion during this period to buy out some of the leases. If that total of \$7.9 billion were applied toward purchase of tankers, it would represent a reasonable start toward replacing the tanker fleet through a normal acquisition process. Because the Boeing 767 commercial aircraft has been in production since 1982 and thus represents little development risk, the Air Force should be able to negotiate a multi-year procurement for a substantial number of aircraft. This would not provide the same firm order for 100 aircraft in the current lease proposal, but it would still represent a large transaction for Boeing on its 767 production line. However, this approach might involve delays in deliveries of the first aircraft, depending on how much budget authority is available

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<sup>4</sup> Department of Defense and Emergency Supplemental Appropriations for Recovery from and Response to Terrorist Attacks on the United States Act, Pub. L. 107-117, § 8159, 115 Stat. 2230, 2284-85.

<sup>5</sup> Section 309 of the Emergency Supplemental Appropriations for Iraq and Afghanistan Security and Reconstruction for Fiscal Year, 2004, S. 1689, 108th Cong. § 309 (2003), requires that the Secretary of Defense submit a report to the congressional defense committees describing an analysis of alternatives for replacing the capabilities of the fleet of KC-135 fleet aircraft. The Air Force has indicated, however, that it will probably initiate a tanker requirements study sometime between fiscal years 2004-2006, followed by a formal analysis of alternatives (AOA). Air Force officials have stated that a formal AOA could take up to two years to complete.

<sup>6</sup> The Special Purpose Entity would be a trust created under the laws of Delaware that would issue bonds to raise sufficient capital to purchase the new aircraft from The Boeing Company and lease them to the Air Force.

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in fiscal year 04 and fiscal year 05. Deliveries might also have to be spread over a longer period if the Air Force and DOD do not provide additional funding priority for tankers. This approach, too, would provide the Air Force some time to study tanker requirements and analyze options before committing to a large program.

We could not develop costs for these two options in the time available. Air Force officials believe that adoption of either of these options would delay delivery of the first aircraft and further believe that while less costly in the short term, the proposals could increase total program costs.

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## Agency Comments and Our Evaluation

In oral comments on a draft of this correspondence, DOD and Air Force officials generally concurred with our analysis. These officials also pointed out that their analysis, as contained in the letter from the Deputy Secretary of Defense, was limited specifically to the questions asked of them by you although they have considered other options that were not included.

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We conducted this work from September to October 2003 in accordance with generally accepted government auditing standards.

Unless you announce its contents earlier, we plan no further distribution of this letter until 10 days from its issue date. At that time, we will send copies of this letter to the Chairman and Ranking Member of the Committee on Armed Services, House of Representatives, and the defense subcommittees of the Senate and House Committees on Appropriations. We will send a copy to the Chairman, Subcommittee on Readiness, House Committee on Armed Services, for whom we are conducting a broader body of work in this area. We will also send copies to the Secretary of Defense and the Director of the Office of Management and Budget. We will also make copies available to other interested parties upon request. In addition, the letter will be available at no charge on the GAO Web site at <http://www.gao.gov>.

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We appreciate this opportunity to be of assistance. If you or your staffs have any questions regarding this letter, please contact me at (202) 512-4914 or Brian J. Lepore, Assistant Director, at (202) 512-4523. Other key contributors to this review were Ann M. Dubois, Joseph J. Faley, Jennifer K. Echard, Kenneth W. Newell, Madhav S. Panwar, Charles W. Perdue, Kenneth E. Patton, and Tim F. Stone.



Neal P. Curtin, Director  
Defense Capabilities and Management

Enclosures

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# Enclosure I: Scope and Methodology

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To assess the validity of the Department of Defense's (DOD) assumptions, accuracy of cost and savings estimates associated with the various options addressed by the Deputy Secretary of Defense in his response to the Committee, and to identify alternative acquisition strategies, we met with DOD and Air Force officials to discuss detailed information related to the options. These discussions included the nature and scope of the options selected, as well as the assumptions and methodologies used in the analyses. We also obtained and reviewed Air Force data used to generate the cost and savings estimates contained in DOD's response, validated that the data was appropriately included or excluded to support the details of the individual options chosen, tested the accuracy of the computations, and conducted our own independent analyses.

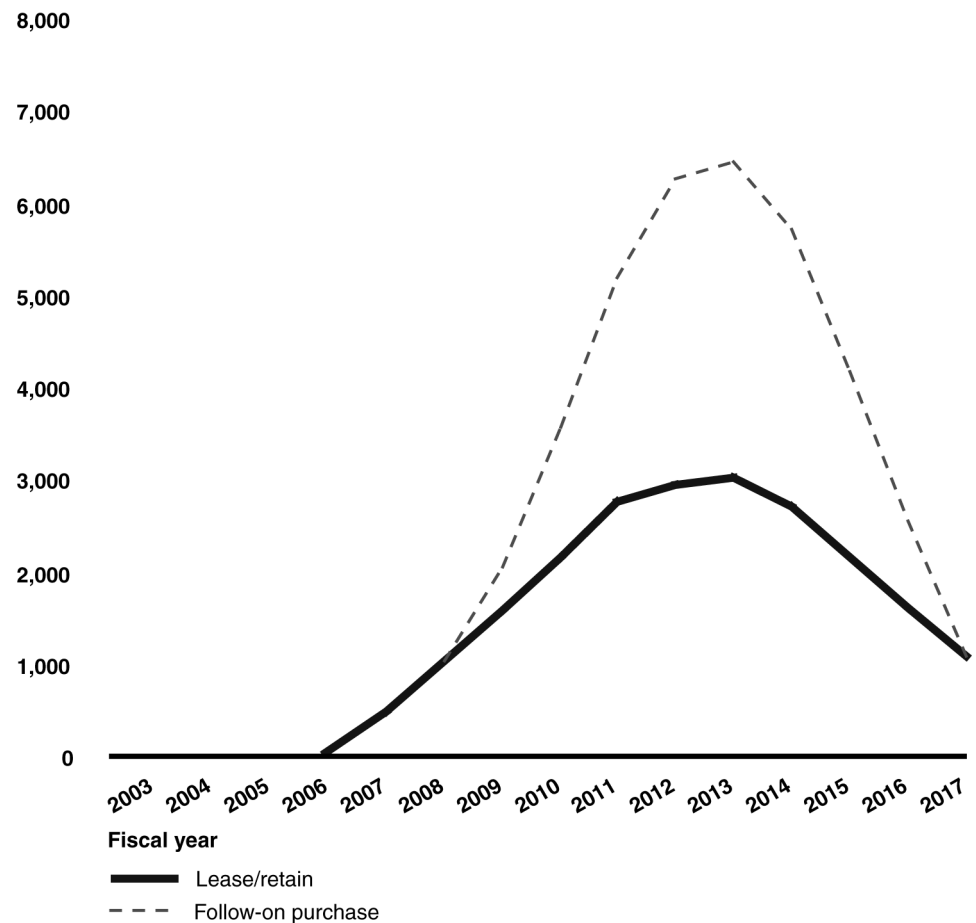
To assess the funding impacts of the various options when combined with a subsequent purchase of 100 aircraft, we compared Air Force data for each of the options to a postulated buy of an additional 100 aircraft beginning in fiscal year 2012 at the rate of 20 aircraft per year. We used the Air Force's purchase price for the aircraft, spread the payments for each aircraft over a 4-year period per Air Force data, and adjusted the data to reflect then-year dollars.

# Enclosure II: Impact of Air Force Options on Budget Authority Requirements

Follow-on procurements to the initial lease of 100 aircraft will be a necessary part of any tanker replacement program. Because the funding requirements of the proposed lease are deferred until later years, those requirements will impact the requirements for subsequent tanker acquisitions. The following figures provide an approximate illustration of how the various options effect the funding requirements for future refueling aircraft purchases beyond the first 100.

**Figure 1: Annual Budget Authority Required to Initially Lease 100 Aircraft and to Purchase 100 Follow-On Aircraft**

Budget authority (then year dollars in millions)



Source: GAO analysis of Air Force data.

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**Enclosure II: Impact of Air Force Options on  
Budget Authority Requirements**

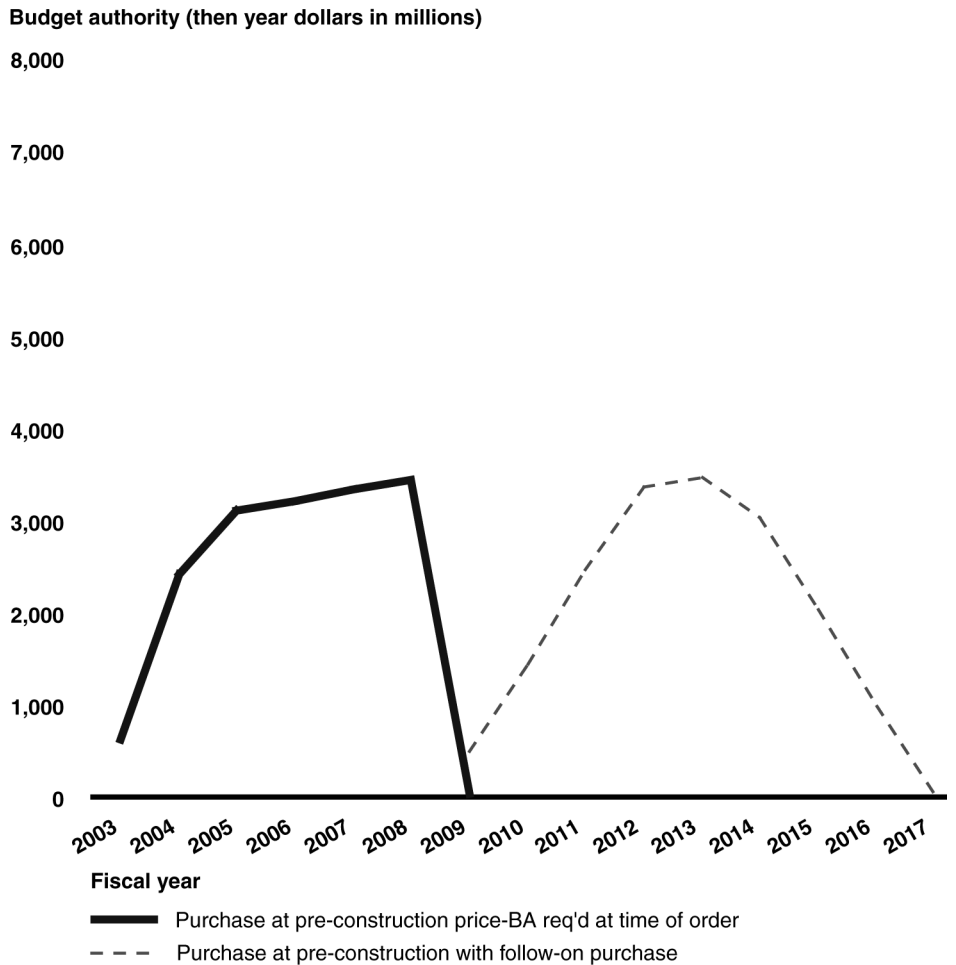
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Combining a follow-on purchase of 100 aircraft with the Air Force's original proposal to lease 100 aircraft, would require maximums of about \$6.3 billion and \$6.4 billion in budget authority in fiscal years 2012 and 2013 respectively, as shown in figure 1. About \$3.6 billion would be required during the current FYDP and a total of about \$38.5 billion would be required over the entire program.<sup>1</sup>

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<sup>1</sup> These totals include only procurement costs and do not represent total program costs.

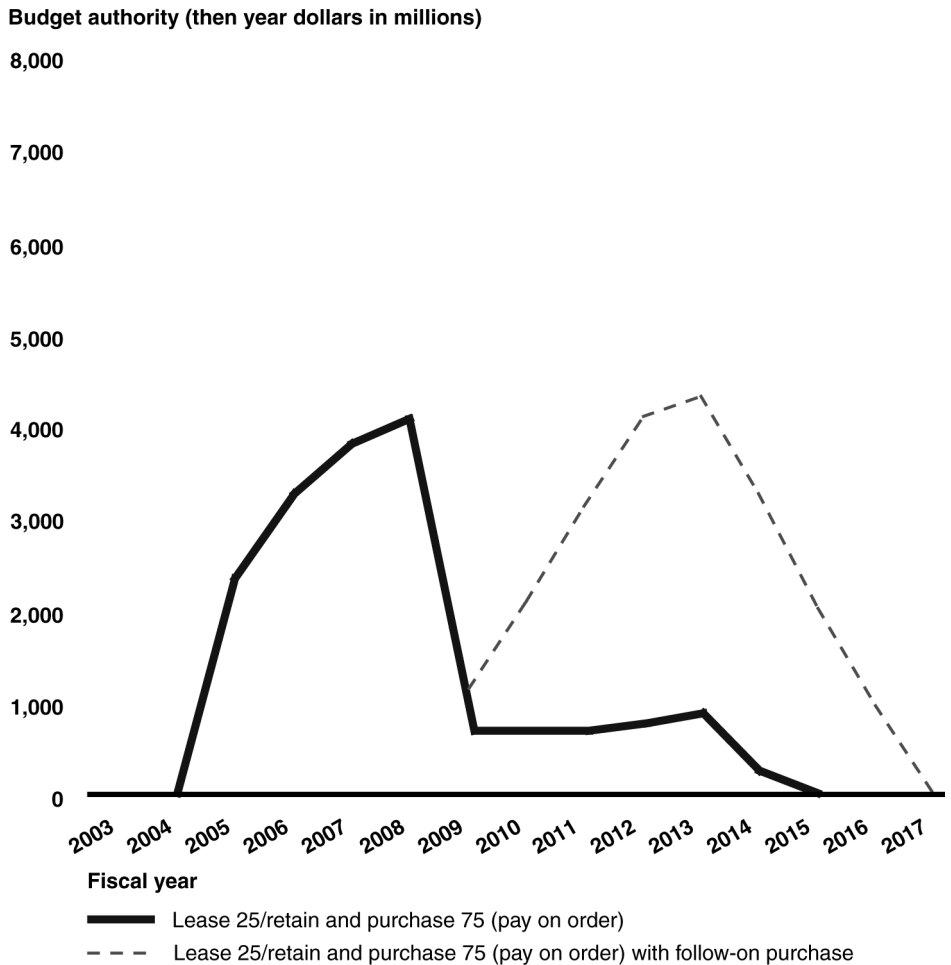
**Figure 2: Annual Budget Authority Required to Purchase Both an Initial 100 And Second Block of 100 Aircraft**



Source: GAO analysis of Air Force data.

Purchasing the initial 100 aircraft, when combined with a follow-on purchase, would have the least impact on overall budget authority requirements. As figure 2 shows, an initial purchase of 100 aircraft followed by a subsequent purchase of an additional block of 100 aircraft would require maximums of about \$3.4 billion in budget authority in fiscal years 2008 and 2013 to procure the aircraft. About \$15.8 billion would be required during the current FYDP and a total of about \$33 billion would be required over the entire program to procure the 200 aircraft.

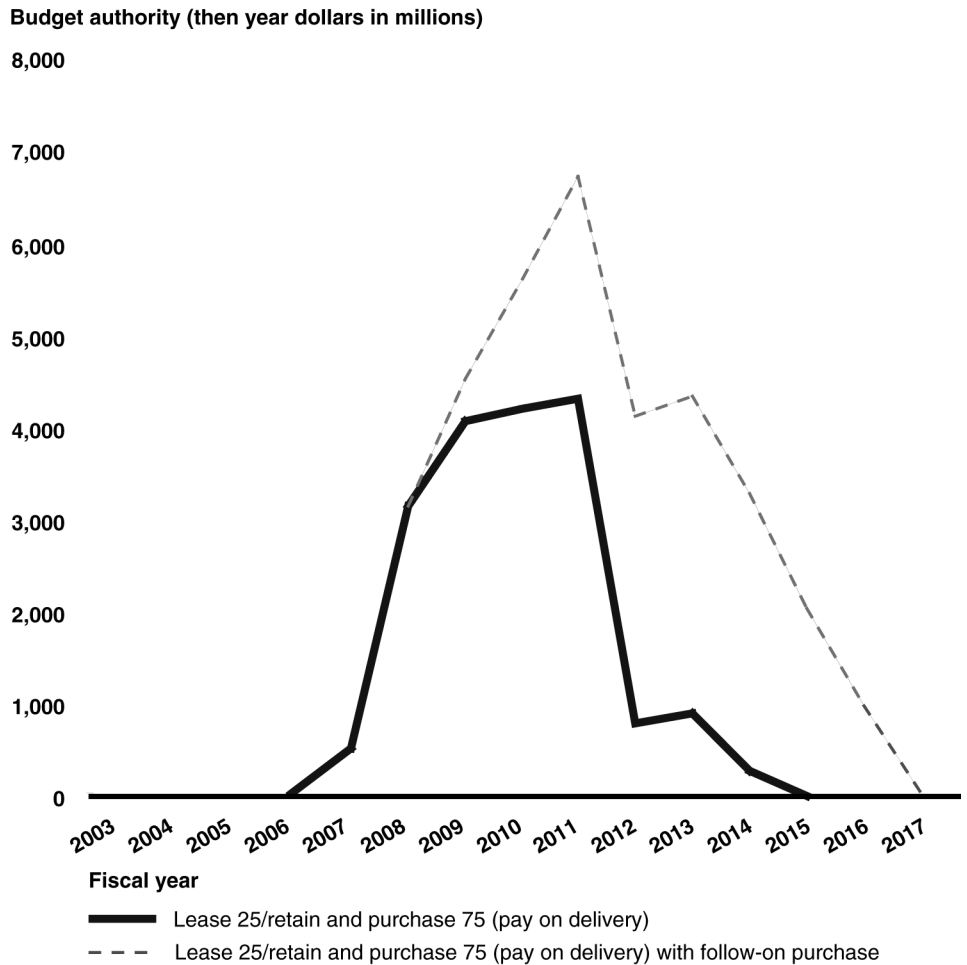
**Figure 3: Annual Budget Authority Required to Lease 25 Aircraft and to Purchase 75 Aircraft at Time of Order and to Purchase 100 Follow-On Aircraft**



Source: GAO analysis of Air Force data.

Combining a follow on purchase of 100 aircraft with the alternative of initially leasing 25 aircraft and purchasing 75 others, would require maximums of about \$4.1 billion and \$4.3 billion in budget authority in fiscal years 2012 and 2013, respectively, as shown in figure 3, if the 75 aircraft were paid for when ordered. About \$14.5 billion would be required during the current FYDP and a total of about \$34.3 billion would be required over the entire program.

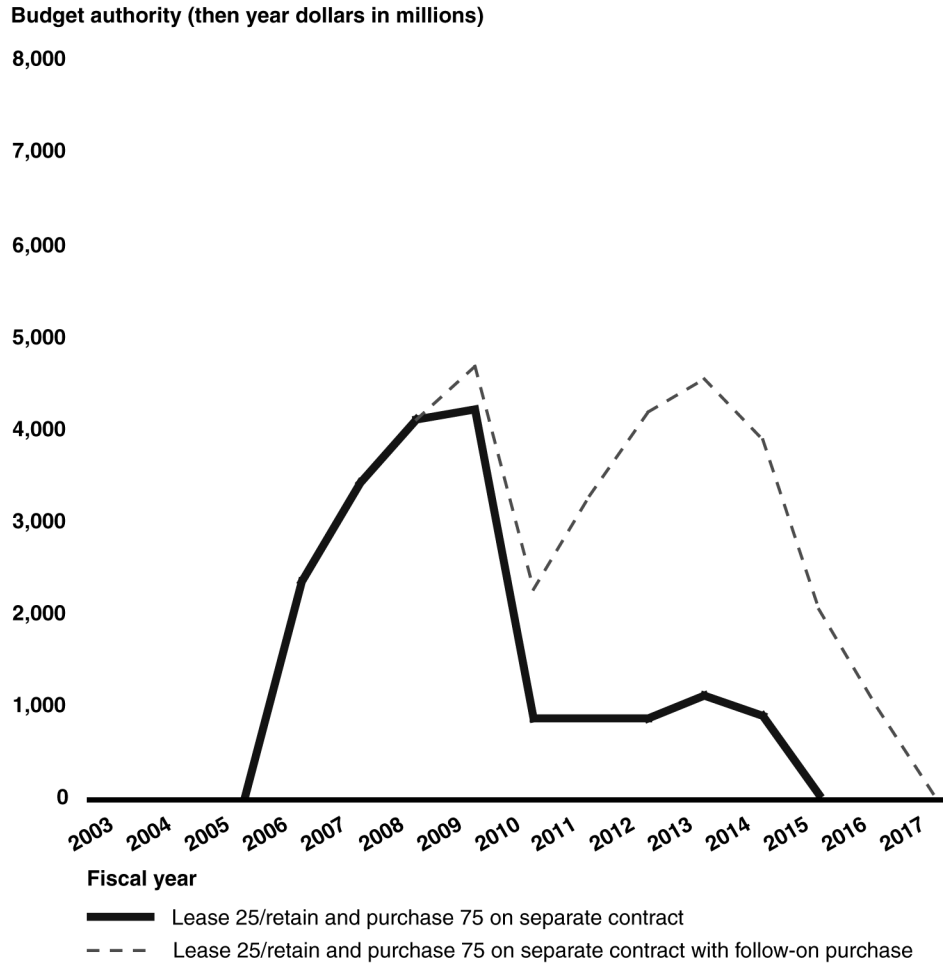
**Figure 4: Annual Budget Authority Required to Lease 25 Aircraft and to Purchase 75 Aircraft at Time of Delivery and to Purchase 100 Follow-On Aircraft**



Source: GAO analysis of Air Force data.

Paying for the initial 75 aircraft in the previous option on delivery would require maximums of about \$5.6 billion and \$6.7 billion in budget authority in fiscal years 2010 and 2011, respectively, as shown in figure 4. About \$8.1 billion would be required during the current FYDP and a total of about \$35 billion would be required over the entire program.

**Figure 5: Annual Budget Authority Required To Initially Lease 25 Aircraft and to Purchase the Remaining 75 Aircraft of the Initial Block under a Separate Contract and to Purchase 100 Follow-On Aircraft**

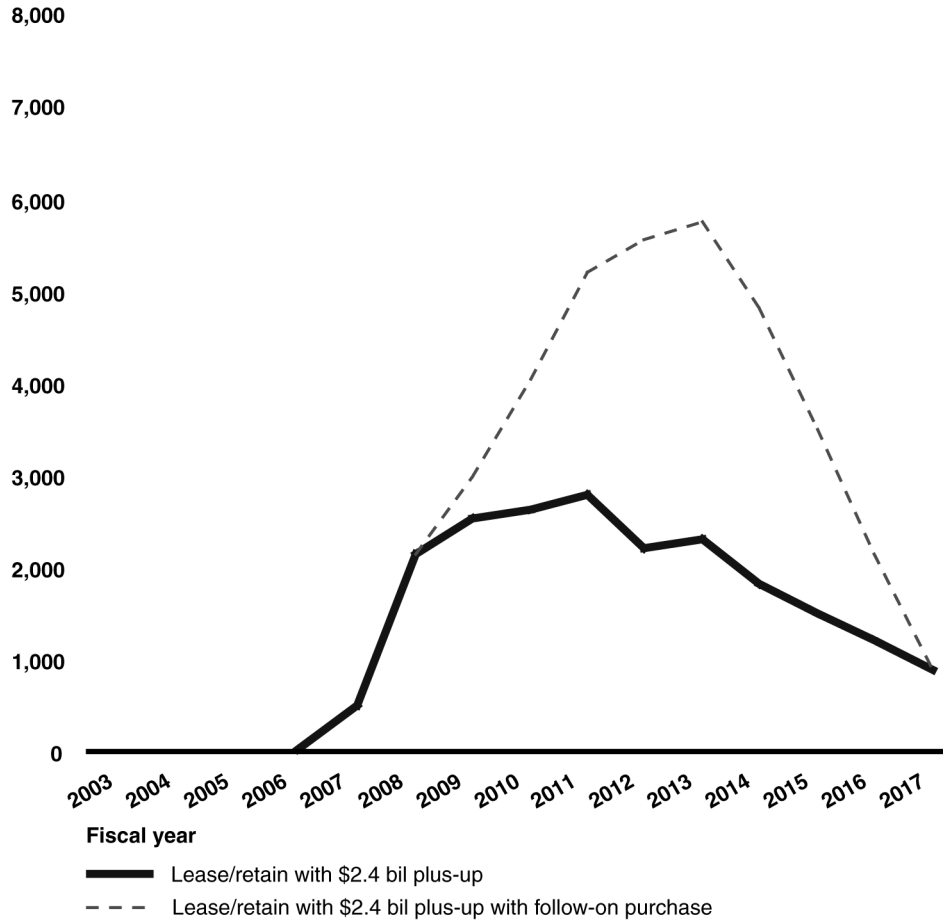


Source: GAO analysis of Air Force data.

Combining a follow-on purchase of 100 aircraft with the option of initially leasing 25 of the initial 100 aircraft and negotiating a separate contract for the purchase of the remaining 75 aircraft of the initial block, would require maximums of about \$4.6 billion and \$4.5 billion in budget authority in fiscal years 2009 and 2013, respectively, as shown in figure 5. About \$14.4 billion would be required during the current FYDP and a total of about \$35.3 billion would be required over the entire program.

**Figure 6: Annual Budget Authority Required to Initially Lease 74 Aircraft and to Purchase 26 Aircraft and to Purchase 100 Follow-On Aircraft**

Budget authority (then year dollars in millions)



Source: GAO analysis of Air Force data.

Combining a follow-on purchase of 100 aircraft with the option of purchasing 26 of the initial 100 aircraft, would require maximums of about \$5.5 billion and \$5.7 billion in budget authority in fiscal years 2012 and 2013, respectively, as shown in figure 6. About \$5.6 billion would be required during the current FYDP and a total of about \$37.3 billion would be required over the entire program.

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