



CONGRESSIONAL BUDGET OFFICE  
U.S. Congress  
Washington, DC 20515

Peter R. Orszag, Director

October 9, 2007

Honorable Solomon Ortiz  
Chairman  
Subcommittee on Readiness  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

In response to your request, the Congressional Budget Office (CBO) has reviewed the Department of Defense's (DoD's) use over the past several years of commercial aircraft in the Civil Reserve Air Fleet (CRAF) to support military operations. It has also examined DoD's proposal to raise the limit on the amount of business that DoD can guarantee commercial carriers at the beginning of each federal fiscal year to encourage them to participate in the CRAF program.

The enclosed report describes the analysis carried out by CBO's National Security Division. If you would like further details, we would be pleased to provide them. The report was prepared by David Arthur, who can be reached at (202) 226-2618.

Sincerely,

A handwritten signature in black ink, appearing to read 'Peter R. Orszag'.

Peter R. Orszag

Enclosure

cc: Honorable Ike Skelton, Chairman  
House Armed Services Committee

Honorable Duncan Hunter, Ranking Member  
House Armed Services Committee

Honorable Carl Levin, Chairman  
Senate Committee on Armed Services

Honorable John McCain, Ranking Member  
Senate Committee on Armed Services



# **Issues Regarding the Current and Future Use of the Civil Reserve Air Fleet**

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## Overview

To support military operations in Afghanistan and Iraq, the Department of Defense (DoD) has made substantial use of commercial air transportation provided by carriers that participate in the Civil Reserve Air Fleet (CRAF) program. Over the 2002–2006 period, DoD’s total expenditures for airlift services provided by CRAF carriers averaged about \$2.1 billion annually, a nearly fourfold increase over the average during the previous five years. Carriers that participate in the CRAF program are eligible to receive that business from DoD in exchange for making their aircraft and air crews available on short notice to support rapid, large-scale deployments of military forces. DoD is anticipating a substantial decrease in the need for commercial airlift services when operations in the Middle East ultimately wind down. To maintain carriers’ incentives to participate in the CRAF program, DoD submitted a proposal as part of its fiscal year 2008 budget request that would allow it to guarantee CRAF carriers more business at the beginning of a fiscal year than it is currently authorized to guarantee.

At the request of the Subcommittee on Readiness of the House Armed Services Committee, the Congressional Budget Office (CBO) examined how the increased use of commercial airlift services over the past few years and the potential increase in the guaranteed portion of DoD’s airlift business might affect the U.S. air transportation industry and the military’s ability to attract participants to the CRAF program over the long term. CBO found that although DoD’s current use of commercial airlift services is at a historically high level, that use is still small in relation to the overall size of the nation’s air transportation industry. For example, U.S. air carriers’ revenues from DoD’s cargo business in 2005 were less than 5 percent of carriers’ total cargo revenues in that year, and their revenues from DoD’s passenger business were less than

2 percent of total passenger revenues. Moreover, those revenues were not spread evenly across the industry but instead were concentrated among a few small airlines. Consequently, a decrease in DoD’s use of commercial airlift services might not have a large adverse effect on the air transportation industry as a whole. However, it could result in a significant loss of revenues for air carriers that currently rely on DoD for a large share of their business if those carriers could not recoup that loss by serving more commercial customers.

During peacetime, the business that DoD offers to CRAF carriers is divided into a “fixed buy,” based on DoD’s known needs for airlift services during the coming year, and an “expansion buy,” to cover additional requirements as they arise. The fixed buy is a particularly strong incentive for carriers to participate in the CRAF program because it is set at a guaranteed level at the beginning of each fiscal year.<sup>1</sup> If DoD’s projections of its needs for commercial airlift support after the end of operations in Iraq and Afghanistan are accurate, the fixed-buy portion of the CRAF program—and therefore the incentive for businesses to participate in the program under current policies—will be considerably smaller than it was before the start of the current conflicts in the Middle East.<sup>2</sup>

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1. From 1997 through 2001, the fixed buy averaged slightly more than half of DoD’s total CRAF business. Since the beginning of the wars in Afghanistan and Iraq, the fixed buy has averaged about 20 percent of all CRAF business.
  2. DoD expects smaller fixed buys in part because it plans to reduce the number of military personnel stationed overseas by more than a third—or about 70,000 people—over the next several years. Much of the fixed buy pays for routine missions to transport people and cargo between overseas bases and the United States. However, DoD anticipates that expansion buys will increase because it will be more costly to deploy forces from the United States than from overseas bases that would be nearer likely areas of operations.

To maintain the pre-2002 levels of guaranteed business (and thus the incentive), DoD has proposed setting those guaranteed amounts for CRAF participants at no more than 80 percent of its average *total* commercial business—that is, fixed and expansion buys—over the preceding five years (omitting years of unusually high demand). The proposal would allow DoD initially to provide guarantees that are up to 50 percent higher than those provided before 2002, CBO estimates. Because the proposal would allow guaranteed payments to be based on expected rather than known requirements, the government would run some risk of having to pay for services that it might not use.

The amount of guaranteed DoD business before 2002 proved to be a sufficient incentive to attract CRAF participants—in fact, the number of aircraft committed to the program was larger than the number required under DoD’s wartime deployment scenarios. Nevertheless, whether those levels will be enough of an incentive in the future is unclear. On the one hand, industry analysts predict substantial growth in air transportation revenues in the coming decade—which would make DoD’s peacetime business smaller relative to the overall market and therefore less worth the risk of the disruption to carriers’ commercial operations that results when DoD calls up aircraft for a large-scale CRAF activation.<sup>3</sup> On the other hand, because a larger number of aircraft would be operated by a larger air transportation industry, the temporary loss of aircraft to an activation under the CRAF program might be less disruptive to commercial operations than it would have been in the past.

## The Civil Reserve Air Fleet Program

The CRAF program was created to augment DoD’s fleet of military transport aircraft during times of high demand for airlift services. Under the CRAF business model, U.S. commercial air carriers contractually commit aircraft and air crews for use by DoD during times of crisis. In exchange for that commitment, DoD makes peacetime business available to carriers that participate in the program.

3. See, for example, Boeing’s “World Air Cargo Forecast 2006–2007,” available at [www.boeing.com/commercial/cargo/index.html](http://www.boeing.com/commercial/cargo/index.html).

## The Structure of the Civil Reserve Air Fleet

The fleet is divided into three main segments—international, national, and aeromedical evacuation—that primarily reflect the type of aircraft required for operations. Aircraft in each of the segments can be activated in three stages, depending on the airlift services that are needed to augment the military’s transport capacity.

**CRAF Segments.** Most of the aircraft in the Civil Reserve Air Fleet are committed to the international segment, which is divided into a long-range section (for aircraft that have a minimum range of 3,500 nautical miles) and a short-range section (for aircraft that have less endurance; see Table 1). Most of the aircraft in the CRAF’s long-range section are passenger planes because the Air Force’s long-range transports—the C-17s and C-5s—are configured to be more useful for carrying cargo. The much smaller national segment of the fleet also has two sections: a domestic section for most transportation within the United States and a small section for the support of operations in Alaska.<sup>4</sup> The domestic section includes only passenger aircraft, and the Alaskan section, only cargo aircraft. The aeromedical evacuation segment includes Boeing 767 aircraft that can be rapidly reconfigured into flying ambulances.

**Stages of CRAF Activation.** The commander of the United States Transportation Command (USTRANSCOM), with the concurrence of the Secretary of Defense, has the authority to activate the Civil Reserve Air Fleet, which can be called up incrementally in three stages.

- Stage I covers minor operations or operations in which adequate time is available so that a small augmentation of the military’s fleet is sufficient to move the required people or cargo. A Stage I CRAF activation of long-range international cargo and passenger aircraft occurred from August 1990 to January 1991 in support of Operation Desert Shield, and a Stage I activation of long-range international passenger aircraft

4. As of June 2007, aircraft committed to the Alaskan section included propeller-powered DC-6 and L-100 aircraft suitable for operating from the kind of rugged, semiprepared airstrips often found in the Arctic. (The L-100 is a commercial version of the military’s C-130 Hercules, and the DC-6 is a civilian version of the C-118 Liftmaster.) In contrast, the aircraft that carriers have committed to the other parts of the fleet are more-modern commercial jets.

**Table 1.****Aircraft Committed to the Civil Reserve Air Fleet in June 2007, by Segment**

	Cargo Aircraft			Passenger Aircraft		
	Stage I	Stage II	Stage III	Stage I	Stage II	Stage III
International Segment						
Long-range section	31	79	300	42	147	690
Short-range section	n.a.	12	12	n.a.	13	270
National Segment						
Domestic services section	n.a.	0	0	n.a.	24	37
Alaskan section	n.a.	4	4	n.a.	0	0
Aeromedical Evacuation Segment	n.a.	0	0	n.a.	25	50

Source: Congressional Budget Office using information from the United States Transportation Command.

Notes: Internal divisions of the Civil Reserve Air Fleet (segments and sections) reflect the unique capabilities required of committed aircraft.

n.a. = not applicable.

occurred from February to June 2003 in support of Operation Iraqi Freedom.

- Stage II is tailored for a major theater war that requires rapid deployment of forces. In January 1991, the long-range international segment was activated to Stage II for both passenger and cargo aircraft in support of Operation Desert Shield/Desert Storm.
- Stage III would be required if the military had to fight more than one major theater war at the same time or operate in a larger crisis. A Stage III CRAF activation has never occurred. It was seriously considered after the Desert Storm air war began, in late January 1991, but was rendered unnecessary by the short duration of the conflict.

The Stage I and II examples given above are the only times that the Civil Reserve Air Fleet has been activated. As of June 2007, a total of 73 aircraft were committed to Stage I; 304 to Stage II; and 1,363 to Stage III.

**Contractual Relationship Between Carriers and the Government.** Under the CRAF program, U.S. air carriers commit aircraft and crews to the specific segments described above. When DoD activates the Civil Reserve Air Fleet, the carriers continue to operate the aircraft, but their scheduling comes under the control of the Air Force's Air Mobility Command. Although the government pays carriers a negotiated rate per ton-mile or passenger-mile for the use of the aircraft during an activa-

tion, a carrier's commercial business may be significantly disrupted by the temporary unavailability of its aircraft.

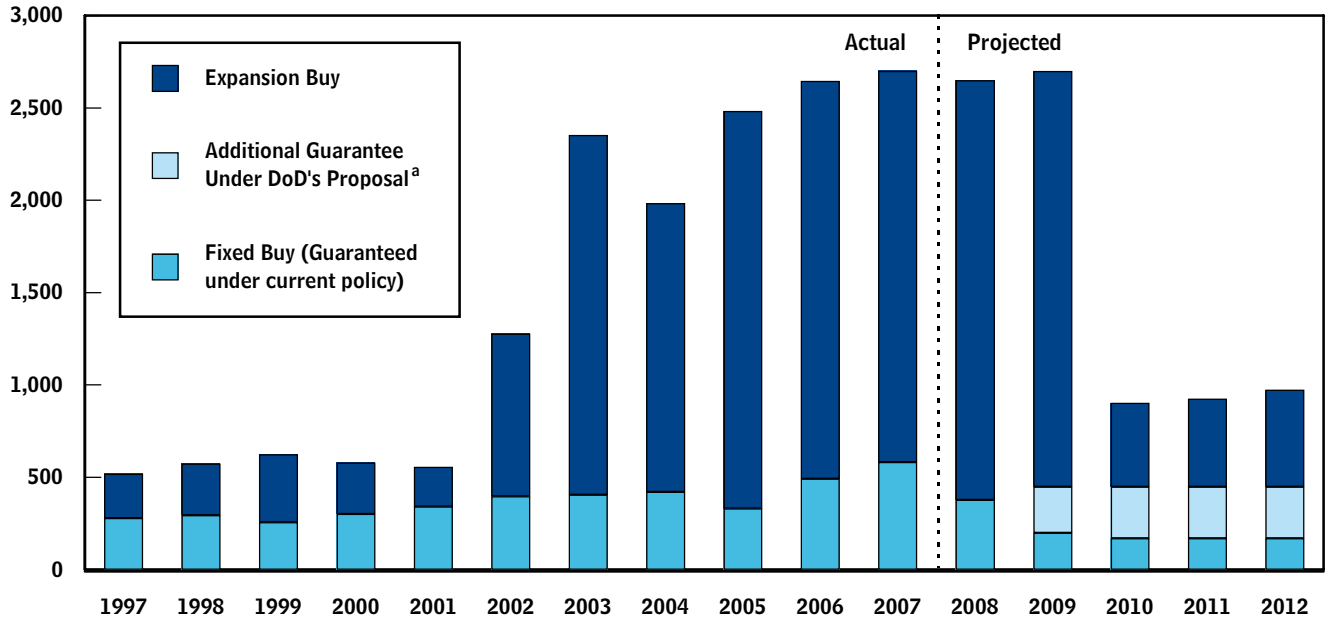
For example, after the Stage II CRAF activation during Operation Desert Shield/Desert Storm, executives at airlines that participated in the CRAF program expressed concern about the long-term loss, to competitors, of the business that they had been forced to forgo because their aircraft were committed to the military's operations.<sup>5</sup> Such concerns were significant enough to result in the CRAF program's not meeting its goals for participation during the two years following Desert Shield/Desert Storm. The government responded by strengthening the incentives for participation, including guaranteeing a minimum level of use (and thus a minimum payment) for activated aircraft and changing rate structures in the program to account for unexpected operations costs, such as those experienced during Desert Shield/Desert Storm. The primary incentive for a carrier to participate despite the risk of a disruptive call-up remained the opportunity to receive the government's peacetime business in proportion to the airlift capacity that the carrier had committed to the CRAF program. (The term "peacetime business" here denotes airlift services purchased by the government when the Civil Reserve Air Fleet is not formally activated.

5. See James K. Matthews and Cora J. Holt, *So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm* (Department of Defense, Office of the Chairman of the Joint Chiefs of Staff and the United States Transportation Command, 1995).

**Figure 1.**

**Actual and Projected Expenditures for the Civil Reserve Air Fleet**

(Millions of dollars)



Source: Congressional Budget Office based on historical and projected data on fixed and total buys from the United States Transportation Command.

Note: CRAF carriers are offered a “fixed buy” based on known airlift needs for the coming year and an “expansion buy” for additional needs as they arise. Under current policy, the fixed buy is guaranteed at the beginning of each fiscal year.

a. CBO estimates.

Peacetime business may, nevertheless, support combat operations.)

As noted, the government’s peacetime business is divided into a fixed buy and an expansion buy. The fixed buy covers airlift support that can be specifically identified for the coming year. For example, a base in Germany might require a known number of transport flights each week to carry out its routine operations. The expansion buy covers other airlift needs that may arise, especially support for contingency operations, for which specific requirements are not known in advance. The distinction between the fixed buy and the expansion buy is important because the government guarantees payments to CRAF program participants in the amount of the fixed buy at the beginning of each fiscal year. Those guaranteed payments are a particularly attractive incentive to carriers to participate in the Civil Reserve Air Fleet because they can count on those funds in formulating their annual

business plans. However, during the year, carriers are paid only when services are rendered; payment for the unused portion of the guarantee, if any, would be disbursed at the end of the year.

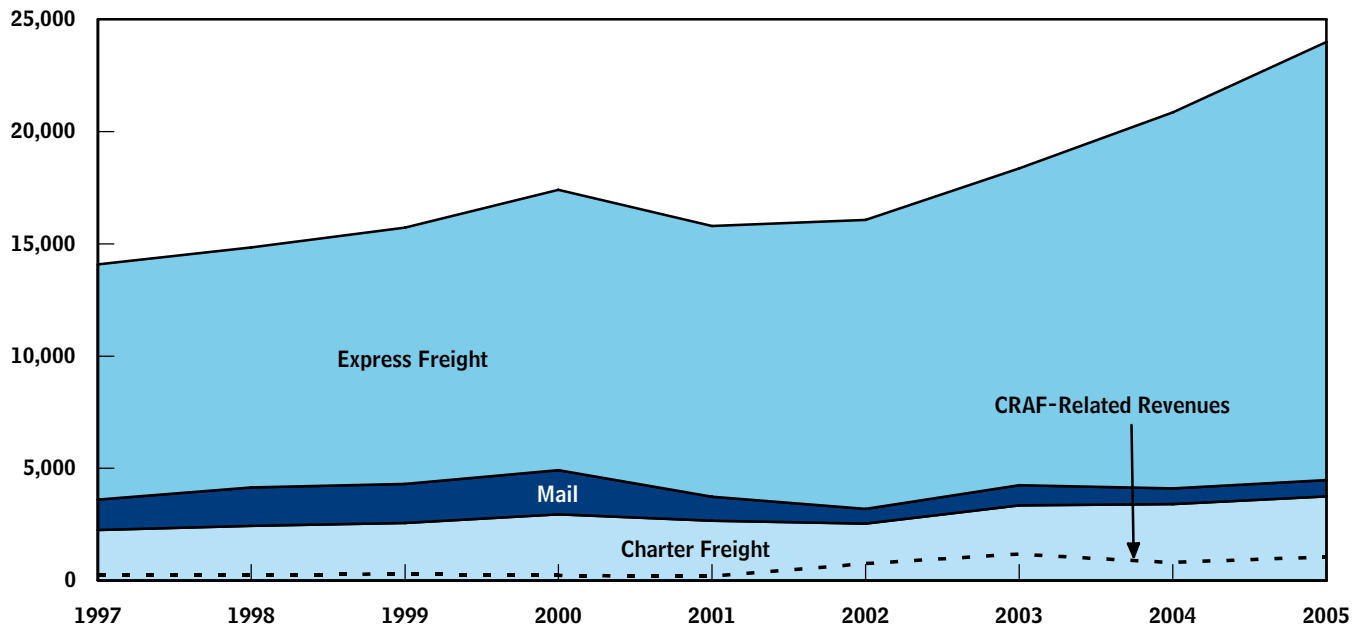
**Implications of DoD’s Recently Increased Use of CRAF Carriers**

Since the beginning of the U.S. military’s operations in Iraq and Afghanistan, DoD has been using more commercial airlift services than it did in previous years (see Figure 1). Although the Civil Reserve Air Fleet was activated only briefly, from February to June 2003, the government’s annual expenditures for commercial airlift services provided through the CRAF program from 2002 through today have been nearly four times greater than the annual average during the 1997–2001 period. Because the CRAF program was designed to give DoD a “surge” airlift capacity for short periods, the military’s



**Figure 2.****Revenues of U.S. Cargo Air Carriers**

(Millions of dollars)



Source: Congressional Budget Office based on information from the Air Transport Association's *2006 Economic Report* and the United States Transportation Command.

Note: CRAF = Civil Reserve Air Fleet.

prolonged use of commercial aircraft over the past several years to augment its airlift capacity has raised concerns about whether the commercial industry is becoming too reliant on DoD's business, a dependence that could leave it economically vulnerable when DoD's airlift needs eventually return to levels more typical of peacetime. However, CBO's analysis indicates that the U.S. commercial air transportation industry as a whole is sufficiently large that a decrease in business from the government might not have significant adverse implications. Nevertheless, some small cargo and passenger CRAF participants could find themselves in trouble because they currently rely on DoD for a large portion of their revenues.<sup>6</sup>

**Cargo Carriers.** DoD's use of the Civil Reserve Air Fleet during the past several years has accounted for an average of less than 5 percent of the Air Transport Association's estimate of total cargo revenues of U.S. air carriers.<sup>7</sup> Although that percentage is about three times larger than the approximately 1.5 percent share of revenues seen prior to 2002, the share of total cargo revenues attribut-

able to current CRAF participants has remained small relative to the revenues of the entire air cargo industry.

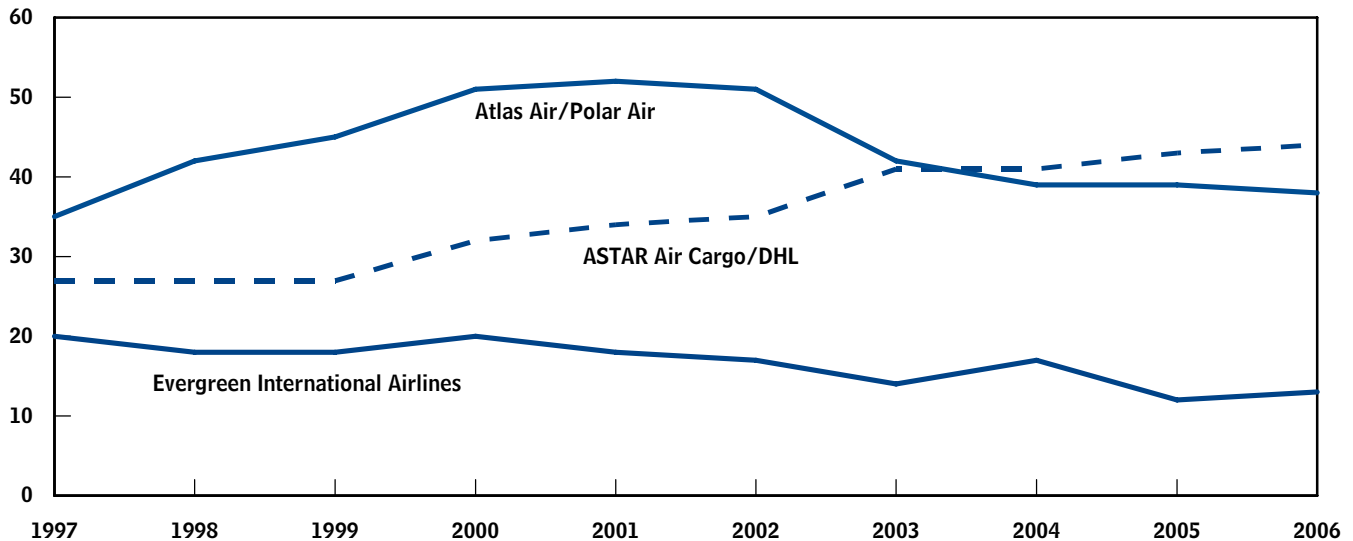
As Figure 2 shows, the largest and fastest-growing portion of air cargo revenues comes from transporting express and other time-definite freight, a type of cargo usually

6. CBO's conclusions are similar to those of a large study by the Institute for Defense Analyses (IDA) that was completed in 2003. The study was conducted during the slump that occurred in the airline industry following the September 11, 2001, terrorist attacks. Nevertheless, the IDA study, which included extensive interviews with airline industry officials, concluded that DoD's commercial airlift business had "an insignificant impact on the financial health of the nation's largest air carriers." The study noted, however, that in the case of several smaller carriers, DoD's business "contributes to the carrier's long-term survival." See Institute for Defense Analyses, *Sustaining the Civil Reserve Air Fleet (CRAF) Program* (Alexandria, Va.: Institute for Defense Analyses, May 2003).

7. Air Transport Association, *Economic Report* (Washington, D.C.: Air Transport Association, various years), available at [www.airlines.org/products/pubs/product-detail.htm?Product=61](http://www.airlines.org/products/pubs/product-detail.htm?Product=61).

**Figure 3.****Fleet Sizes of Selected Cargo Air Carriers**

(Number of aircraft)



Source: Congressional Budget Office based on information from the Air Transport Association's annual *Economic Reports*.

handled by door-to-door carriers (for example, United Parcel Service and FedEx). Although such carriers have made significant commitments to the CRAF program, they most often opt to resell the DoD business for which they are eligible, directing it to charter cargo carriers. In 2006, for example, commitments by the large express and time-definite freight carriers represented between 35 percent and 55 percent of the cargo aircraft available in Stages I to III of CRAF's long-range international segment. Those carriers, however, transported less than 4 percent (as measured by revenues earned) of the cargo moved for DoD that year. Most of DoD's peacetime business goes to charter air cargo carriers, which form a smaller segment of the air cargo industry. Since the onset of operations in Afghanistan, in 2001, DoD's cargo business has averaged about 30 percent of the revenues of U.S. charter air cargo firms, up from about 10 percent during the preceding five years.

Although cargo carriers have clearly seen a sizable increase recently in the business they receive from the government, there is no evidence that carriers have added aircraft to their fleets that they could not sustain if the government's business were to diminish. For example, the three companies that received about 80 percent of DoD's cargo airlift expenditures for 2006—Atlas Air/Polar Air, Evergreen International, and ASTAR—do not appear to

have significantly enlarged their fleets over the past several years (see Figure 3). That stability suggests that even those companies could accommodate a reduction in government-provided business.

**Passenger Carriers.** In the case of passenger carriers, the greater use of the Civil Reserve Air Fleet over the past several years has accounted for less than 2 percent of total air passenger revenues, on average—a smaller share than that observed for cargo carriers (see Table 2). As is the case with cargo carriers, though, that business has been concentrated among a few smaller carriers; in 2006, for example, four such carriers accounted for more than 80 percent of CRAF passenger revenues.

Historically, DoD's business has been a bigger fraction of U.S. charter passenger revenues than of charter cargo revenues. For the period 1997 to 2001, the use of CRAF funds to transport passengers averaged slightly more than 20 percent of the total value of passenger charters; since 2002, that average has risen to more than 50 percent. The increase stems from the large number of troops being rotated to and from Afghanistan and Iraq as well as from DoD's preference for carrying cargo on military aircraft. As a result, charter passenger carriers would potentially be more vulnerable to the effects of a drop in DoD's business.

**Table 2.****Estimated Revenues of U.S. Passenger Air Carriers**

(Millions of dollars)

Year	Industrywide Services		CRAF Percentage
	Scheduled	Charter	
1997	79,540	1,500	0.3
1998	81,052	1,600	0.4
1999	84,383	1,700	0.4
2000	93,622	1,950	0.4
2001	80,947	1,800	0.4
2002	73,577	1,700	0.7
2003	77,379	2,250	1.5
2004	85,646	2,250	1.3
2005	93,500	2,430	1.5
2006	101,208	2,200	1.4

Source: Congressional Budget Office.

Notes: Data on scheduled services were drawn from the Air Transport Association's (ATA's) *2007 Economic Report*. CBO estimated revenues for charter services on the basis of ATA data; it calculated the percentages of revenues attributable to the use of CRAF-related funds on the basis of data from the United States Transportation Command.

CRAF = Civil Reserve Air Fleet.

**Reliance of Individual Carriers on Business from DoD.**

In its use of the CRAF program, DoD tries to ensure that individual participants do not rely too heavily on the government's peacetime business because a carrier that dedicated a large portion of its capacity to DoD during peacetime would have little additional capacity to contribute to a wartime surge. To address that issue, DoD has maintained a long-standing policy that no more than 40 percent of a CRAF carrier's revenues should come from the government. Carriers that exceed the 40 percent threshold may be penalized by lower limits on the amount of DoD's business that the department assigns to them in subsequent years. However, DoD may also grant waivers to that so-called 60/40 policy under certain circumstances. For example, if a carrier accepts additional business from the government to help DoD avoid a Stage I activation, DoD may exempt the payments for that business from the 60/40 calculation. In addition to ensuring that the military maintains airlift capacity for a surge, the 60/40 policy reduces the likelihood that individual carriers will become too reliant on business from DoD.

Of the 33 cargo and passenger air carriers that elected to participate in the CRAF program during fiscal year 2007, four fell below the threshold of at least 60 percent in

commercial revenues (see Figure 4). The four below-threshold carriers operated only 52 aircraft, a small fraction of the more than 4,000 aircraft operated by all carriers participating in the CRAF program. Three of those four provided primarily passenger transportation to DoD. Not all small carriers participating in the CRAF program are as heavily reliant on DoD's business as those four are. (For example, in terms of total revenues, the ten smallest carriers were all above the 60 percent threshold for commercial revenues.)

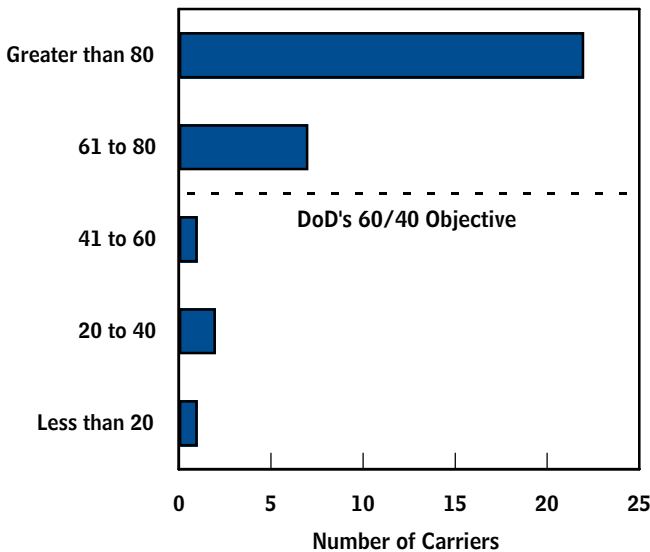
**Implications of Changing the Way That CRAF Guarantees Are Established**

DoD has requested the authority to change the method it uses to calculate the annual guaranteed level of business for CRAF carriers.<sup>8</sup> Currently, the guarantee is equal to the fixed-buy portion of the CRAF program, which is based on firmly known, well-established needs (such as routine missions to move people and cargo between overseas bases and the United States). As a result, there is little

8. The current method of establishing that level is codified in acquisition regulations that limit the government's ability to budget for anticipated yet unspecified needs.

**Figure 4.**  
**Fraction of CRAF Carriers' Revenues from Commercial Customers**

(Percentage of revenues)



Source: Congressional Budget Office based on 2007 data from the United States Transportation Command.

Notes: The 60/40 objective refers to the Department of Defense's policy that no more than 40 percent of a CRAF carrier's revenues should come from the federal government.

CRAF = Civil Reserve Air Fleet.

chance that the guarantee will exceed the military's actual requirements. Under DoD's proposal, the new guaranteed level of business would be "based on forecast needs but may not be for more than eighty percent of the annual average expenditures of airlift for the prior 5-year period. Unusually high demand years, such as during a conflict, will normally be omitted to obtain a more accurate forecast." In other words, under the proposal, the guaranteed level might include funds that would previously have been disbursed as part of an expansion buy.

From 1997 to 2001, before operations began in Afghanistan and Iraq, DoD's guaranteed fixed buy averaged about \$300 million per year, and the expansion buy averaged about \$280 million. DoD, however, expects that the volume of airlift services that would qualify as part of the fixed buy will diminish, primarily because the United States plans to reduce the number of military personnel stationed overseas. Indeed, the department's prediction of

a 40 percent drop in fixed-buy levels is consistent with its plans to reduce the number of people stationed overseas by about 70,000, or 35 percent. Thus, under current policies, the guaranteed amount of CRAF funding could drop to about \$180 million per year. (However, DoD expects that the decrease in the fixed buy will be partially offset by an increase in the expansion buy, because in responding to unanticipated crises, the military will probably have to dispatch troops from the United States instead of from foreign bases that are closer to likely areas of operations.)

In documents in support of its proposal, DoD indicates that the changes are necessary to maintain the pre-2002 level of guaranteed CRAF funding and retain an adequate incentive for carriers to participate in the program after the end of major operations in the Middle East. The guarantee limit that DoD proposes would initially allow significantly higher guarantees, however—80 percent of the average total CRAF buy for 1997 through 2001 would be nearly \$450 million, which is about 50 percent greater than the \$300 million average annual guarantee over the earlier period but less than total CRAF spending in any year during that period. (The wartime span of 2002 through 2008 would be excluded from the calculation.)

Because the need for peacetime commercial airlift support has changed only slowly over time, the Air Force's planners are likely to establish a conservative CRAF business guarantee to avoid committing funds unnecessarily to airlift services. For example, briefings from USTRANSCOM show that projections of annual guarantees beginning in 2009 are closer to the 1997–2001 average level of about \$300 million, which is significantly lower than the maximum allowed under the proposed legislation. Yet whether even the higher guarantee levels would be adequate in the future to attract sufficient numbers of air carriers to the CRAF program is uncertain. The substantial growth predicted for the air transportation industry in coming years means that today's guarantee levels and perhaps even DoD's current total purchases of commercial airlift services will be a steadily diminishing piece of total U.S. air transportation revenues. As a result, air carriers may decide that the revenues available from DoD's CRAF peacetime business are not worth the risk of disruption in their commercial operations if the

reserve fleet is activated and carriers' aircraft are diverted to support military operations.

Conversely, though, if the airlift capacity needed for the reserve fleet's various stages of operations does not increase, the aircraft that might be called up during a CRAF activation would be a significantly smaller fraction of the commercial fleet. Boeing, for example, predicts a doubling of the world's air freighter fleet over the next 20 years.<sup>9</sup> Air carriers might be more willing to partici-

pate in the Civil Reserve Air Fleet despite lower or stagnant guaranteed and total business levels if they determined that a CRAF activation posed a smaller risk of disruption. If peacetime business opportunities become an insufficient incentive to encourage carriers to participate in CRAF, DoD may be forced to find other means of obtaining a surge airlift capacity.

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9. See Boeing's "World Air Cargo Forecast 2006–2007."





