THE MOBILIZATION VALUE PROCESS: EFFECTS ON CRAF PARTICIPATION

GRADUATE RESEARCH PROJECT

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John A. Glaze

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Abstract

The Civil Reserve Air Fleet (CRAF) has played a vital role in our nation's ability to rapidly mobilize in times of crisis for nearly half a century. In addition to providing augmentation during contingencies, CRAF carriers fly side-by-side with their military counterparts on a daily basis during peacetime. Air Mobility Command (AMC) has come to rely on civil air carriers to satisfy a significant portion of its airlift requirements. As a result, maintaining a robust CRAF is more important today than ever before.

AMC draws carriers into the CRAF by offering them access to peacetime government airlift business. To determine each carrier's fair share of business, AMC uses the Mobilization Value (MV) Process. The MV Process provides the critical link between a carrier's commitment to the CRAF and its entitlement to airlift business. As a result, the MV Process directly influences the level of participation and composition of the CRAF.

This paper examines the MV Process and its implications on CRAF participation. Specifically, this paper explores how the MV Process has an influence on 1) the role of carrier teaming arrangements, 2) the current shortfall in CRAF's aeromedical evacuation lift capability, and 3) CRAF compliance with Global Air Traffic Management (GATM) requirements. In addition, some alternatives for improving the MV process are presented.

THE MOBILIZATION VALUE PROCESS:

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I. Introduction

Background

The Civil Reserve Air Fleet (CRAF), instituted in 1952, is a voluntary contractual program designed to augment United States (US) military airlift forces with civil air carriers to support national defense emergency airlift requirements. Because the CRAF is entirely voluntary, Air Mobility Command (AMC) relies on incentives to attract civil air carrier participation in the program. The most influential incentive is the link between CRAF participation and access to US government airlift business. This link is key to the viability of the CRAF program and, in turn, to our nation's ability to rapidly mobilize during national emergencies.

To be in the CRAF, an air carrier must commit a minimum of 30 percent of its passenger and/or 15 percent of its cargo fleet in widebody equivalents (WBEs). As a member of the CRAF, a carrier has access to Government Services Administration (GSA) and AMC airlift contracts. However, a mere minimum level of participation from the air carriers is insufficient to meet airlift requirements set by the Joint Chiefs of Staff (JCS). To provide incentive for carriers to commit more than the minimum level, AMC allocates entitlement to Department of Defense (DoD) airlift business in proportion to each carrier's commitment to the CRAF. This business is contracted to carriers using

negotiated fixed-rate pricing. Therefore, carriers do not compete for AMC contracts based on price.

AMC uses the Mobilization Value (MV) Process for determining each carrier's fair share of the pie. Key to the process is the MV Model. The MV Model calculates a point value for each carrier or team of carriers based on the type and number of aircraft, as well as to what stage and segment of the CRAF a carrier's aircraft is assigned. Points are totaled and the total value for each carrier is then converted into entitlement to DoD airlift business. Once an entitlement has been granted to an air carrier, the carrier can profit by either utilizing the entitlement themselves or, if they are part of a teaming arrangement, trading the rights to the entitlement to another carrier within the team for some form of compensation.

As the DoD continues to move from a posture of forward presence to one of forward projection using continental United States (CONUS) based forces, and the Air Force's C-141s are retired and replaced with a fewer number of C-17s, reliance on the civil airlift sector will continue to grow. As a result, it is more important than ever to ensure that participation in the CRAF is sufficient enough to meet our nation's wartime needs. Insufficient capacity or an improper mix of assets in the CRAF could seriously impair the military's ability to project forces in support of national interests.

General Issue

The MV Process serves as the linking mechanism between commitment to the CRAF and entitlement to US government business. As such, the process has a significant impact on the level of participation and composition of the CRAF. This paper is intended to provide the reader with an understanding of the MV Process and the implications it has on three current CRAF issues: 1) teaming arrangements, 2) the shortfall in aeromedical airlift capacity, and 3) compliance with GATM requirements.

Overview of Subsequent Chapters

Chapter II chronicles the history of the CRAF. Chapter III discusses the CRAF program to include its structure, current composition and capabilities, as well as the various incentives designed to attract participation in the program. Chapter IV explores the MV Process and gives an example of how a carrier's commitment is converted first to a point value and later to entitlement to DoD airlift business. Chapters V examines how the MV process influences teaming arrangements, participation in the CRAF's Aeromedical Segment, and CRAF compliance with GATM standards. Finally, Chapter VI provides alternatives for improving the MV Process.

II. History of the CRAF

Civil aviation has been critical to the military's ability to mobilize in times of crises for well over half a century. Recognizing the importance of civil aviation to National Defense, a 1934 War Department special committee, the Baker Board, concluded, *"There should be a very close liaison between civil and military aviation"* (Miller, 1988:6). World War II proved the importance of airlift and demonstrated the need for a close relationship between civil and military airlift. In fact, during the war, 33 percent of all US air cargo was transported by civilians (Miller, 1988:35). Following World War II, the Finletter Commission was appointed to review the relationship between military and civilian airlift and to formulate a National Aviation Policy. The committee recommended that commercial airlines should provide augmentation when the military experiences airlift shortfalls. Furthermore, the committee recommended that a contractual relationship should be developed between the military and commercial airlines to guarantee civil airlift's availability in times of crises. The committee's recommendations would provide the foundation for the CRAF. (Finletter, 1948:28-35)

Acting on the Finletter Commission's recommendations, President Truman signed Executive Order 10219, *Defining Certain Responsibilities of Federal Agencies with Respect to Transportation and Storage*, on March 2, 1951. The order called for a formal agreement between the DoD and the airlines concerning use of commercial aircraft during contingencies. In 1952, the DoD and the airline industry reached an agreement, formally establishing the CRAF (Priddy, 1993:15). The details of the plan were

published in *The Department of Defense Plan for the Civil Reserve Air Fleet*, commonly referred to as the "Gray Book", on 20 March 1952.

In January of 1958, the House Subcommittee on Military Operations, chaired by Congressman Chet Holifield, met to debate the concept of a National Airlift Program being proposed by the airline industry. Stuart G. Tipton, president of the Air Transport Association of America (ATA), called for 1) a national airlift (combined military and civil) capable of meeting the needs of the critical days after D-day, 2) a greater reliance on the civil air industry in order to assure an expanded airlift capability at a reduced cost, and 3) constant addition to and modernization of the national air fleet (Miller, 1988:243). He argued:

> *As carriers are used more in peacetime, they become ready to do a larger part of the D-day job...MATS (Military Air Transport Service) can be phased down in size as greater reliance is placed upon the civil carriers. This will result in decreased requirements for capital investment by the government in transport aircraft.* (Miller, 1988:243)

and:

> *The most efficient and effective way to build up the strongest possible total national airlift capability is for MATS transport operations to be concentrated in those fields which require specialized transport aircraft for the outsized and exceptionally heavy-pieced, unusual security precautions, a direct close working relationship with tactical combat units which, for economic reasons, cannot be handled by civil carriers.* (Miller, 1988:244)

The Holifield Committee emphasized the role of the CRAF in both peace and war. The committee recommended a full partnership role for CRAF, to encourage CRAF carriers to purchase cargo aircraft by giving them a larger share of peacetime business, and for the President to direct a new study of civilian policy (Miller, 1988:249).

In response to the Holifield Committee's recommendations, President Eisenhower directed the Secretary of Defense to undertake such a study. In February 1960, the results of the study, entitled *The Role of Military Air Transport Service in Peace and War*, were issued. The report included nine Presidentially Approved Courses of Action that would shape the CRAF program for the next quarter century.

The Role of Military Air Transport Service in Peace and War was superseded by National Security Decision Directive (NSDD) Number 280, *National Airlift Policy*, approved by President Reagan on 24 June 1987. The directive states [in part]:

> *During peacetime, Department of Defense requirements for passenger and/or cargo airlift augmentation shall be satisfied by the procurement of airlift from commercial air carriers participating in the Civil Reserve Air Fleet program, to the extent that the Department of Defense determines that such airlift is suitable and responsive to the military requirements. Consistent with the requirement to maintain the proficiency and operational readiness of organic military airlift, the Department of Defense shall establish appropriate levels for peacetime cargo airlift augmentation in order to promote the effectiveness of the Civil Reserve Air Fleet and provide training within the military airlift system.* (DoD, 1987)

NSDD 280 redefined the relationship between the DOD and civil air carriers, emphasizing the interdependence between civil and military airlift and the importance of providing adequate peacetime business to civil air carriers to ensure the viability of the CRAF. The directive remains the basis for CRAF policy today.

Since it was formally established in 1952, the CRAF has been activated only once, during the Gulf War. On August 17, 1990, the DoD activated Stage I of the CRAF to support deployments for Operation DESERT SHIELD. Stage I provided the Air Force with 17 international passenger aircraft and 21 international cargo planes (CBO, 1997:Ch 2, 4). On January 17, 1991, the Secretary of Defense activated Stage II, providing 77 international passenger and 39 international cargo planes in support of Operation

DESERT STORM (CBO, 1997:Ch 2, 4). Flying 5556 missions (Porter, 1997:1), the US civil fleet deployed 62 percent of the personnel and 27 percent of the cargo to the Gulf and redeployed 84 and 40 percent respectfully (Priddy, 1993:N-2).

Although activated only once, CRAF carriers have routinely provided airlift to augment AMC's organic fleet. In addition, CRAF carriers have been an important part of nearly every major military contingency in the past 50 years. Table 1 summarizes commercial air carrier participation in major contingencies from 1964 to 1996.

Table 1: Civil Air Carriers Participation in Contingencies (1964-1996)

Location/Operation	Year Operation Began	Number of Flights	Cargo Delivered (In Tons)	Passengers Delivered
Vietnam[1]	1964	n/a	1,313,776	11,436,165
Panama (Just Cause)	1989	12	346	2,929
Persian Gulf (DESERT SHIELD/DESERT STORM)	1990	3,604	171,170	405,448
Philippines (Fiery Vigil)	1991	68	2,412	16,882
Northern Iraq (Provide Comfort)[2]	1991	172	2,898	18,294
Former Soviet Union (Provide Hope)[2]	1992	82	4,895	100
Bosnia (Provide Promise)	1992	36	145	2,345
Somalia (Restore Hope)	1992	234	463	52,136
Rwanda (Support Hope)	1994	65	2,138	548
Cuba (Sea Signal V)	1994	214	848	29,524
Panama (Panama Haven/South Haven	1994	24	n/a	4,647
Haiti (Phoenix Shark)	1994	141	1,823	33,546
Cuba (Safe Haven/Safe Passage)	1994	27	0	4,050
Persian Gulf (Vigilant Warrior)	1994	119	1,389	12,010
Bosnia (Joint Endeavor)[3]	1995	534	7,332	41,333

(CBO, 1997:Table B-2)

NOTES:

1. Figures for cargo and passenger transport during the Vietnam War are approximate.
2. As of August 1995.
3. As of January 1997.

n/a = not available

The history of the CRAF reveals a long-term close and cooperative effort between US civil air carriers and the DoD to meet the nation's airlift needs in peace and in war. Over time, the CRAF has developed into an integral part of DoD's airlift mix, one that would be almost impossible to replace in today's fiscally constrained environment.

III. The CRAF Program

Structure

The CRAF is designed to augment AMC's organic airlift capability with US civil aircraft, aircrews, and support structure during CRAF activation. The CRAF is comprised of three stages. The stages of CRAF activation are designed to meet varying levels of defense airlift needs. The commander of the United States Transportation Command (USCINCTRANS) may activate all three stages of the CRAF with the approval of the Secretary of Defense. The three stages are described below.

Stage I – Lesser Regional Contingency. This stage is activated to support substantially expanded peacetime military airlift requirements when AMC's military airlift capability cannot meet both the deployment and other airlift requirements simultaneously. It is comprised of long-range assets only. CRAF international carriers are required to contribute at least one aircraft to Stage I, but their total commitment to Stage I may be no more than 50 percent of their fleet (FY99 CRAF Contract Solicitation, 1998:M-5).

Stage II – Major Theater War. This stage is activated to support a major theater war. Stage II responds to requirements greater than Stage I but less than full national mobilization. Stage II is comprised of the International and Aeromedical Segments.

Stage III – Two Major Theater Wars. This stage is activated to support two major theater wars, or when otherwise necessary for the national defense. Stage III is also comprised of all three segments.

In addition to being divided into three stages, aircraft within the CRAF are divided into three segments: International, National, and Aeromedical. Each aircraft committed to the CRAF is assigned to one of the three segments based on its performance capabilities. USCINCTRANS has the flexibility to activate different segments, sections, elements, or particular aircraft within each stage of the CRAF on an as needed basis. The three segments of the CRAF are described below.

International Segment. The International Segment consists of short- and long-range sections. The long-range section provides the greatest capability to transport passengers and cargo. Response time upon activation is 24 hours for Stages I and II, and 48 hours for Stage III (Routh, 1997). Aircraft in the long-range International Segment must be over-water capable with an extended-range of at least 3500 nautical miles (Routh, 1997). The short-range section supports near offshore operations with both passenger and cargo aircraft capable of flying at least 1500 nautical miles. The long-range section exists in all three stages of the CRAF.

To be eligible for the International Segment and a share of DoD peacetime business, participants must: 1) be a Federal Aviation Administration (FAA), Federal Aviation Regulation, Part 121, certificated air carrier, 2) demonstrate 12 months of prior equivalent service in the commercial sector, and 3) be placed on the DoD's list of approved carriers, and not in a suspended or temporary non-use status, by successfully completing an air carrier survey by the DoD Air Carrier Survey and Analysis Division (HQ AMC/DOB). In addition, carriers must commit a minimum of 30 percent of their passenger or 15 percent of their cargo fleets in widebody equivalents. A carrier that only operates short-range aircraft must offer a minimum of 30 percent of its passenger fleet or

15 percent of its cargo fleet in B-727-100 equivalents to Stages II and III. Carriers operating both passenger and cargo aircraft must commit the minimum from each type of aircraft. Moreover, the aircraft committed must be US-registered aircraft capable of a 10 hours per day utilization rate. Furthermore, carriers must commit at least four cockpit crews per aircraft. Each crewmember must be a US citizen and free of any military reserve obligation (FY98 CRAF Contract, 1997).

National Segment. The National Segment consists of the Domestic Services and Alaska sections. The Domestic Services section provides passenger and cargo aircraft for domestic-only service using regional US air carriers with at least 75 seats (30,000-lbs. allowable cabin load) and a cargo capability of at least 32,000 lbs. The Domestic Services section is used in CRAF Stage III only. The Alaska section provides cargo aircraft support to Alaska in CRAF Stage II and Stage III. (NSDD-280, 1997:Ch II, 8)

Aeromedical Segment. The Aeromedical Segment exists to assist in the evacuation of casualties from operational theaters to hospitals in the continental United States. This segment of the CRAF consists of reconfigured Boeing B-767 aircraft, which augment organic aircraft such as the C-141 and C-17 in the intertheater aeromedical role. In addition, these aircraft are used to move medical supplies and crews to the theater, thus permitting other aircraft to maximize the cargo flow. Forty-four Aeromedical Evacuation Ship Sets (AESSs) kits are available to convert commercial Boeing B-767s to carry 87 litter patients plus medical crew and 20-40 ambulatory patients (Routh, 1997). Once configured, AESSs provide organic litter, oxygen, and electrical capability to each litter position (Jenkins, 1997). Carriers in the Aeromedical Segment must make their first

aircraft available for modification within 48 hours of activation (Bamberg, 1998). The Aeromedical Segment is used in both CRAF Stage II and III.

There are a wide variety of aircraft in the CRAF. Table 2 below lists the types of aircraft in each segment of the CRAF:

Table 2: Types of Aircraft in the CRAF

International Segment			
Long-Range		Short-Range	
Passenger	Cargo	Passenger	Cargo
A300-600ER	DC8-51F / 52F / 54F / 55F / 61F / 62F / 63F / 71F / 73F	A300-B4	B727-100F / 200F
B757-200ER	DC8-62 COMBI	B727-200	DC9-33F
B747-100 / 200 / 400	B747-100F / 200F	B737-300 / 400 / 500	L100-30
B767-200ER / 300ER	DC10-10F / 30F/C	MD-80 / 83	
B777	MD-11F		
DC10-10 / 15 / 30 / 40	L1011-200F		
MD-11			
L1011-50 / 100 / 150 / 250 / 500			
National Segment		Aeromedical	
Domestic (Passenger)	Alaskan (Cargo)		
B727-100 / 200	B727-100 (Combi)	B767-200ER / 300ER	
B737-200 / 300 / 400 / 500	DC-6		
MD-80 / 83	L100-30		

(AMC/DOF - Form 312, 1998)

Current Status

In FY 98, there were 684 aircraft committed to the CRAF with a capacity of 123.6 million passenger-miles (MPM) per day and 29.8 million ton-miles (MTM) per day for cargo (AMC/DOF – Form 312, 1998). This lift capability accounts for 93 percent of AMC's strategic passenger lift (Routh, 1997), and nearly 50 percent of its cargo capacity (AMC/DOF – Form 312, 1998). Table 3 shows how the aircraft are divided among the stages and segments of the CRAF. Note that the figures for Stage II and Stage III are

cumulative, in the sense that aircraft in Stage I are considered part of Stage II, and Stage II aircraft are considered part of Stage III.

Table 3: Number of Aircraft Committed to the CRAF (FY98)

Segment	Section	Element	Stage I	Stage II	Stage III
International	Long-range	Passenger	40	115	261
		Cargo	36	95	247
	Short-range	Passenger	N/A	14	76
		Cargo	N/A	16	16
National	Domestic	--	N/A	N/A	50
	Alaskan	--	N/A	N/A	6
Aeromedical	--	--	N/A	25	28
Total	--	--	76	266	684

(AMC/DOF – Form 312, 1998)

In FY98, CRAF cargo capacity reached 29.8 MTM/day, 9.3 MTM/day greater than the JCS-set requirement of 20.5 MTM/day. The increase in CRAF cargo capacity helped AMC exceed the overall strategic airlift requirement of 49.7 MTM/day, set after the recent Mobility Requirements Study Bottom-Up Review (MRS BURU) (AMC/XP, 1998:Ch 2, 29-30). During a speech on 21 August 1997, the commander of the United States Transportation Command and AMC, General Walter Kross, credited the CRAF program for boosting AMC's lift capability to 58 MTM, more than 8 MTM over the requirement. Kross called the CRAF program a "management success" (Kross, 1997).

There are currently 40 air carriers in the CRAF, 32 of which operate in the International Segment, 7 in the National Segment, and 3 in the Aeromedical Segment

(Southern Air Transport operates in both the International and National Segments). A list of all the carriers in the CRAF is provided in Table 4.

Table 4: CRAF Carriers (FY98)

International		National		Aeromedical
Long-Range	**Short-Range**	**Domestic**	**Alaskan**	
Airborne Express	Alaska Airlines	America West Express	Northern Air Cargo	Delta Airlines
Air Transport International	American Trans Air	Frontier Airlines	Reeve Aleutian	Trans World Airlines
American Airlines	Carnival / Pan Am Airlines	Reno Air	Southern Air Transport	US Air
American International Airways	DHL Airways	Southwest Airlines		
American Trans Air	Evergreen International			
Arrow Air	Express One			
Atlas Air	Miami Air International			
Burlington Air Express	Omni Air Express			
Continental Airlines	Southern Air Transport			
Delta Airlines	Sun Country Airlines			
DHL Airways	USAir Shuttle			

Table 4 (continued)

International		National		Aeromedical
Long-Range	**Short-Range**	**Domestic**	**Alaskan**	
Emery Worldwide				
Evergreen International				
Federal Express Airlines				
Fine Airlines				
North American Airlines				
Northwest Airlines				
Polar Air Cargo				
Southern Air Transport				
Sun Country Airlines				
Tower Air				
Trans Continental Airlines				
United Airlines				
United Parcel Service				
World Airways				

(AMC/DOF – Form 312, 1997)

Today, CRAF capability exceeds JCS requirements in all segments and stages except Aeromedical. In FY95, the requirement for CRAF passenger airlift capability was decreased from its cold-war requirement of 210 WBEs to its current requirement of 136 WBEs. The current capacity of 174 WBEs far exceeds this mark. The cargo requirement remains at 120 WBEs or 20.5 MTM/day (AMC/XP, 1998:Ch 2, 31). Again, the current capacity of 174.79 WBEs or 29.8 MTM/day is well above the requirement (AMC/DOF – Form 312, 1998). However, the CRAF is short of the JCS-set requirement of 44 CRAF

aeromedical evacuation aircraft (AMC/XP, 1998:Ch 2, 31). Currently, TWA, Delta, and US Airways supply only 28 B-767s to the Aeromedical Segment (AMC/DOF – Form 312, 1998), 16 aircraft short of the JCS requirement. Table 5 provides a summary of FY98 CRAF requirements and capabilities.

Table 5: CRAF Long-Range International Requirements and Capabilities (FY98)

	Stage I		Stage II		Stage III	
Type	Requirement	Capability	Requirement	Capability	Requirement	Capability
Passenger (WBEs[1])	30	30.63	87	88.03	136	174.00
Cargo (WBEs)	30	30.0	75	76.31	120	174.79
Aeromedical (B-767s)	N/A	N/A	25	25	44[2]	28

Notes: 1. WBEs = Boeing B-747-100 passenger or cargo widebody equivalents
2. JSC Requirement

(AMC/DOF - Form 312, 1998)

Incentives

AMC provides incentives to carriers to gain their participation in the CRAF program. The key incentive is access to peacetime government airlift business. In 1997, a total of $2.153 billion in US government airlift business was conducted by civil air carriers (Childs, 1997). This business consisted primarily of GSA City Pairs and GSA Small Package contracts as well as DoD airlift contracts awarded by AMC under the annual Airlift Services Contract. Table 6 shows the breakdown of the CRAF business base among these categories.

Table 6: CRAF Business Base (FY97)

Category	Million $
GSA City Pairs	$1,500
GSA Cargo	$69
AMC	$584
Total	$2,153

(Childs, 1998)

The CRAF activation during DESERT SHIELD/DESERT STORM opened the eyes of many airlines as to the scope of potential losses associated with CRAF participation. Although the activation was generally considered a success, many air carriers expressed concern that the CRAF business base was insufficient to justify the risks associated with participating in the CRAF. In fact, American and United Airlines opted-out of the CRAF in FY94 for this very reason (Quackenbush, 1998).

By 1994, the CRAF failed to meet its capacity requirements in all categories. In response to declining participation, AMC pursued additional CRAF incentives. The most important to be adopted was the linking of the GSA City Pairs program to the CRAF.

GSA City Pairs Program. Under the GSA City Pairs program, the GSA contracts government airfares over heavily traveled city pair routes for the Federal Government. A carrier awarded a City Pair contract is entitled to the business of military and Federal employees traveling between the two cities. Currently, 5,773 city pairs are in effect, 933 of which are international (SATO, 1998). DoD travelers account for approximately 80 percent of this business (Fogleman, 1996). The airfares offered to federal and military travelers on official business under this program average 70 percent

less than comparable commercial fares, saving the federal government approximately $2.65 billion annually (Hasselbrack, 1998).

In FY95, the GSA City Pairs program was linked to CRAF participation. Under the new GSA contract, access to City Pairs was limited to CRAF carriers, or carriers certified as technically ineligible for the CRAF. Some carriers are not eligible for the CRAF because they do not have aircraft capable of meeting CRAF requirements, but they can still participate in the City Pairs program (Routh, 1997). Table 7 lists the carriers awarded GSA City Pairs contracts in FY97.

Table 7: GSA City Pairs Carriers (FY97)

Carrier	Number of City Pairs	Estimated Value
Delta	1,410	$367,324,174
United	934	$238,504,164
American	796	$230,535,654
US Air	975	$230,477,655
Northwest	856	$222,793,481
TWA	424	$125,997,526
Continental	345	$80,378,085
Southwest	235	$26,280,966
Alaska	38	$13,772,228
Atlantic Coast	26	$5,922,804
Reno	15	$5,887,631
America West	21	$5,318,983
Midway	47	$4,190,157
Midway Express	14	$2,463,583
Trans State	7	$1,640,207
Tower	2	$881,243
World Airways	1	$140,171
American Trans Air	1	$61,263

(GovExec, 1996)

GSA Small Package Program. In 1996, the GSA contract for DoD and Federal government domestic small package requirements (under 150 pounds) was also linked to CRAF participation. FedEx was awarded the first one-year contract with four option years. The contract provides FedEx with $90 - $130 million in revenues annually, but

required FedEx to increase its minimum commitment from 15 percent (the minimum to be a participant in the CRAF) to 30 percent of its fleet for the duration of the contract (Routh, 1997).

GSA City Pairs and Small Package contracts are awarded competitively based on price and service. Because the GSA City Pairs program is a large revenue source for the airlines, $1.5 billion for FY97 (Childs, 1997), all of the major scheduled passenger air carriers, including American and United (the ones that dropped out after DESERT STORM) now participate in both the CRAF and GSA City Pairs. However, since GSA City Pairs only applies to scheduled passenger air carriers, and the small package contract is awarded to a single express cargo carrier, GSA programs provide little incentive for cargo or charter passenger carriers to participate in the CRAF. To provide an incentive to these carriers, AMC offers a program of Fixed and Expansion International Buys, whereby entitlements to DoD airlift business are allocated to CRAF participants based on their level of participation in the CRAF using the MV Model.

AMC Fixed Buy. CRAF carriers provide routine airlift on a daily basis to augment AMC's organic fleet. AMC contracts this type of business to civil air carriers under the Fixed Buy portion of the annual Airlift Services Contract (Porter, 1997). The Fixed Buy is comprised primarily of Category B channel missions. Category B simply means that AMC charters the entire plane, not just a portion of it. Channel missions operate on a recurring basis over international and transoceanic routes to meet the specific operational needs of a military service or a Unified Combatant Command. These missions are part of the Fixed Buy because the requirements and associated expenditures are known well in advance. For example, when the FY98 CRAF contract went to the air

carriers in the fall of 1997, the Fixed Buy for FY98 was predetermined and guaranteed to be $335 million (refer to Table 8 below for a list of the Fixed Buy amounts for FY90 through FY98).

In response to concerns over declining ridership on Category B missions, and an overall concern about the declining peacetime airlift business base following the Gulf War, General Kross, USCINCTRANS, reiterated the DOD policy directing that CRAF carriers will be used to the maximum extent possible, and further directing DoD passengers to use AMC-arranged or operated airlift before the GSA City Pairs. "The bottom line is this, if we don't use these carriers in peace, they won't be there for us in contingency or war," Kross said (American Forces Press Service, 1997).

AMC Expansion Buy. Because airlift requirements are difficult to predict, non-scheduled civil airlift requirements to support exercises and contingencies are often significant. This type of business is contracted to civil air carriers under the Airlift Services Contract through what is referred to as the Expansion Buy (Porter, 1997). Unlike the Fixed Buy, the Expansion Buy is not guaranteed. However, as the figures in Table 8 indicate, it is not uncommon for the Expansion Buy to be as large, if not larger, than the Fixed Buy.

Table 8: AMC Business Base (FY90-FY99)

Category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Fixed	195	273	259	166	214	245	310	328	335	317
Expansion	206	293	242	368	472	292	283	256	270	286*
Total	401	566	501	534	686	537	593	584	605	603*

In Million $ (Childs, 1997)

* = estimated (FY99 CRAF Contract Solicitation, 1998:B-2)

Unlike the GSA City Pairs contracts, which are awarded based on price and service, AMC's Fixed and Expansion Buys are awarded based on the level of commitment to the CRAF using the MV Model. MV points for the Fixed Buy are calculated one time when the CRAF contract is finalized. MV points used to determine each carrier's entitlement to Expansion Buys are recalculated at the beginning of each quarter of the fiscal year, to include any additional aircraft added to the CRAF (FY98 CRAF Contract Solicitation, 1998:H-26). Entitlement for the Expansion Buy not used in one month may not be carried over to future months.

AMC has come up with several other initiatives targeted at drawing more aircraft into the CRAF. Two of these initiatives have developed into the *Worldwide Express* and the *Commercial Access to Military Installations* programs

Worldwide Express. AMC, with GSA cooperation, developed the concept of a *Worldwide Express* (WWX) contract for time-definite, door-to-door, international express small package and cargo deliveries (under 151 pounds). WWX is patterned after the GSA Domestic Small Package contract, only on a worldwide versus domestic scale. Although not active yet, the first solicitation for WWX (FY99) has gone out to the carriers, and if terms can be reached, operations will begin soon (Cygan, 1998). The size

of the WWX contract is estimated to be around $60 million for the first year (Cygan, 1998).

Commercial Access to Military Installations. In 1996, Congress approved a non-traditional CRAF incentive by giving the DoD the authority to allow civil air carriers access to military installations under the *Commercial Access to Military Installations* program (CAMI). Some carriers have shown interest in the program, but as of yet, none of the carriers have begun operations from a military installation under the CAMI program, although some have taken advantage of greater access to military air bases for use as weather alternates (Cygan, 1998; Van Horn, 1998).

IV. Mobilization Value (MV) Process

Most air carriers with aircraft capable of international flight participate in the CRAF. Because each carrier's level of commitment is different, some method must be used to compute the amount of DoD business each carrier is entitled to. To account for variations in aircraft performance characteristics, AMC awards a mobilization value to each aircraft based on the value AMC places on aircraft for meeting wartime requirements. AMC then awards peacetime airlift business to CRAF carriers based on the individual carriers relative contribution to the total computed mobilization value of the aircraft offered to the program.

MV Model

The analytical model by which AMC computes each carrier's mobilization value is known as the MV Model. The CRAF office at Scott Air Force Base, AMC/DOF, runs the model using Microsoft Excel software. Inputs necessary to calculate MV points include the characteristics of each aircraft along with the stage and segment of the CRAF to which the aircraft is committed. Once this data is converted into a point value, the point values are added up for each carrier. AMC/DOF then turns this information over to the Contract Airlift office, AMC/DOY, where entitlements to DoD business are calculated by dividing each carrier's MV points by the total MV points awarded in each category of business. Figure 1 below provides a depiction of the MV/Entitlements process while Figure 2 illustrates the MV Model specifically.

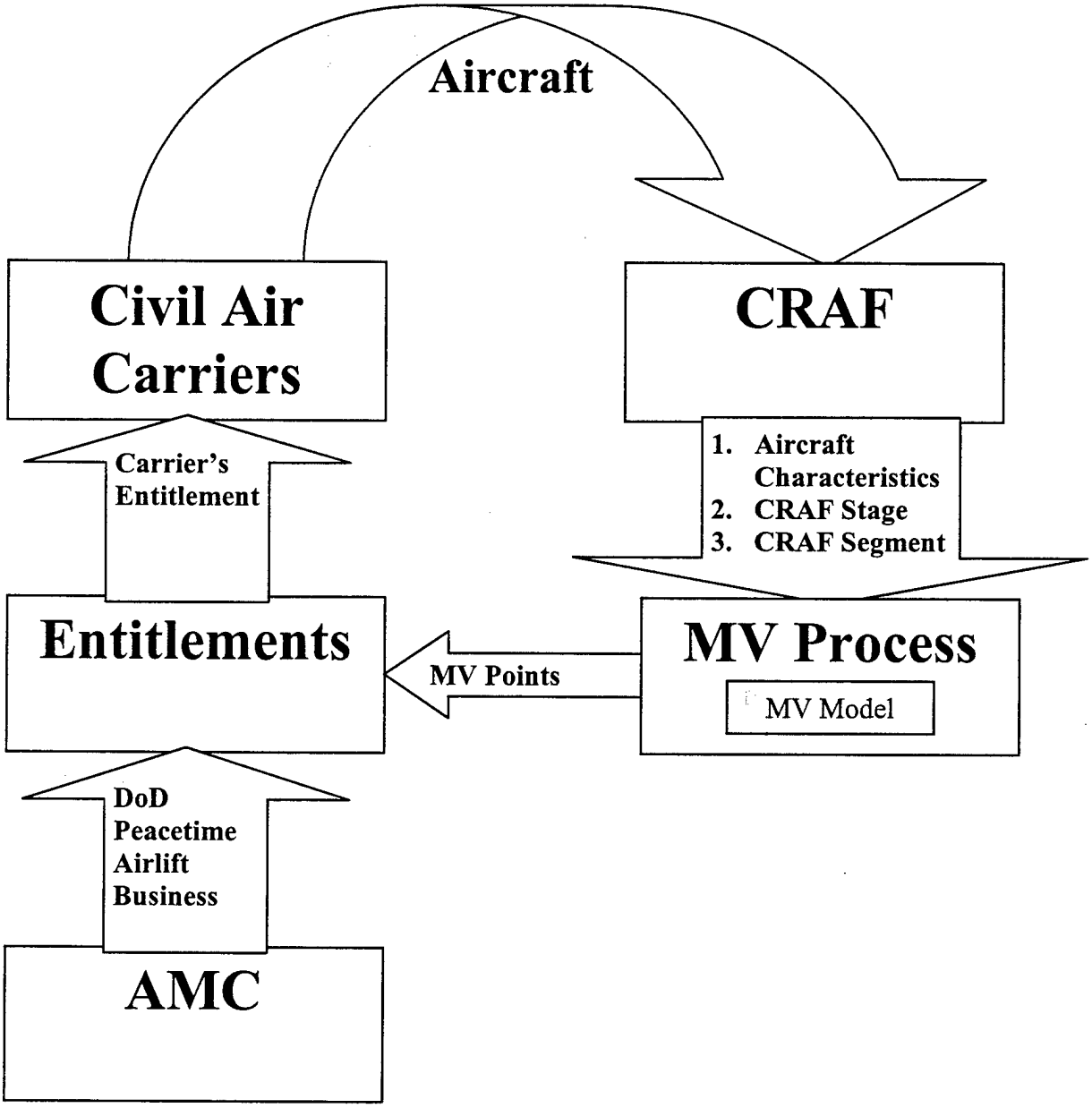

Figure 1: MV Process

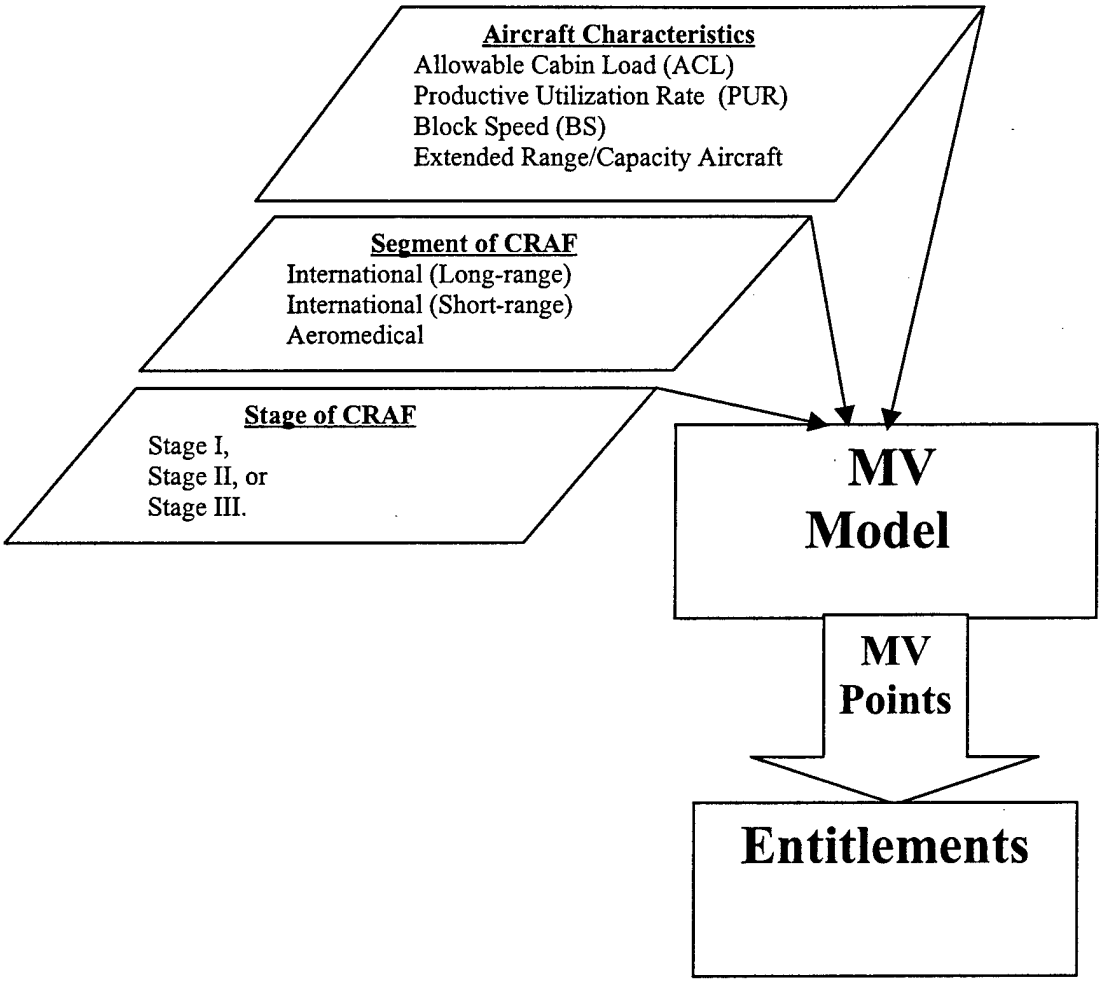

Figure 2: MV Model

The primary unit of measure for airlift capability is either MTM/day for cargo aircraft or MPM/day for passenger aircraft. Capability may also be expressed in terms of WBEs. Before the MV Model assigns a point value, it uses formulas to convert the characteristics of an aircraft into a measure of its performance capability (MTM or MPM). Then this information is used to determine a WBE value. Table 9 provides definitions, and Table 10 provides formulas that are important in understanding this process.

Table 9: MV Model Definitions

Term	Acronym	Definition
Allowable Cabin Load	ACL	Also known as Maximum Payload, this is the maximum amount of cargo, in short tons, or the maximum number of passengers weighing 400 lbs. Each, including all luggage, that can be transported aboard an aircraft of a distance of 3500 nautical miles for long-range aircraft and 1500 nautical miles for short-range aircraft. In some instances, the passenger ACL may be restricted because of an aircraft configuration resulting in fewer seats available.
Block Speed	BS	The average true airspeed, in knots, of an aircraft, including ascent, descent, and taxi to block-in.
Daily Utilization	DUR	The contracted minimum number of hours an aircraft must fly daily, when called up during CRAF activation.
Productivity Factor	PF	The percent of a mission the AMC has deemed to be productive (currently 0.47).
Productive Utilization Rate	PUR	The number of hours in which an aircraft is fully productive. The DUR is multiplied by the AMC PF of O.47, resulting in a PUR of 4.7.
Million Ton Mile/Million Passenger Mile	MTM /MPM	The result of multiplying ACL times BS times PUR divided by one million
Wide Body Equivalent	WBE	The capability of a cargo or passenger (including aeromedical) aircraft in relationship to the Boeing B-747-100 cargo or passenger aircraft. The WBE is computed by dividing the MTM or MPM of a specific aircraft by the average MTM or MPM of the B-747-100 aircraft.

(Van Horn, 1998)

Table 10: Mobilization Value Model Formulas

Widebody	
MV Point Formula for Cargo Aircraft	BS x ACL x PUR / 1,000,000 x 10 = MV B-747-100 MTM
MV Point Formula for Passenger Aircraft	BS x ACL x PUR / 1,000,000 x 10 = MV B-747-100 MPM

(Van Horn, 1998)

AMC/DOF calculates MV points for each aircraft so they can easily be compared and added up for determining a carrier's entitlement. To allow for comparison, AMC/DOF uses the Boeing B-747-100 as its base aircraft. The value for the B-747-100 is calculated first and used as the basis of comparison for all other CRAF aircraft. Table 11 below provides step-by-step calculations for determining the MTM and MPM for the B-747-100.

Table 11: B-747-100 MTM/MPM Calculations

Base Aircraft MTM/MPM Calculations B-747-100 = Wide Body Equivalent	
Block Speed (BS)	465 Knots
Payload (3500NM) (PL)	78 Tons / 325 Passengers
Productive UTE Rate (UR)	4.7 Hours
MTM or MPM Calculation: BS x PL x UR / 1 Million	
MTM = 465 x 78 x 4.7 / 1 Million = 0.170469	
MPM = 465 x 325 x 4.7 / 1 Million = 0.71029	
MV = 0.170469/0.170469 or 0.71029/0.71029 x 10 = 10	

(Van Horn, 1998)

With the base aircraft figures calculated, other aircraft MV point values can be calculated and compared. Table 12 provides an example of the calculations for a DC-10-30F.

Table 12: DC10-30F MTM Calculations

DC10-30F MTM Calculations	
Block Speed (BS)	455 Knots
Payload (3500NM) (PL)	68 Tons
Productive UTE Rate (UR)	4.7 Hours
MTM or MPM Calculation: BS x PL x UR / 1 Million	
MTM = 455 x 68 x 4.7 / 1 Million = 0.145418	
MV = 0.145418/0.170469 x 10 = 8.83	

(Childs, 1997)

Adjustments to the MV Model

The basic formula for calculating MV points requires three pieces of information about the aircraft: 1) block speed, 2) allowable cabin load, and 3) productive utilization rate. Once the basic MV point value is calculated, AMC can make adjustments to provide additional incentives for carriers to provide certain types of aircraft, or to commit their aircraft to a particular segment or stage of the CRAF. Adjustments to basic MV point values have changed over time depending on AMC's airlift needs. Currently, AMC makes adjustments to the basic MV point value for aircraft committed to Stage I, for aircraft committed to the Aeromedical Segment, and for B-747-400, MD-11, MD-11F, and B-777-200IGW aircraft. Aircraft committed to Stage I or the Aeromedical Segment

receive double MV points, and the B-747-400, MD-11, MD-11F, and B-777-200IGW aircraft are given a 20 percent bonus based on their extended range capability of at least 5000 nautical miles (Van Horn, 1998). Table 13 describes the current MV Model adjustments.

Table 13: Mobilization Value Model Adjustments

Category	Adjustment
Stage I (International Long-Range Segment)	Long-Range aircraft assigned to Stage I receive double the value of MV points and single the value when not assigned to Stage I.
Extended Range Aircraft (International Long-Range Segment)	The B-747-400, B-777, and MD-11 aircraft receive a bonus of 20 percent of their points added on, due to their extended range capability of at least 5000 nautical miles.
Aeromedical Aircraft (Aeromedical Segment)	Aeromedical aircraft receive double the value of MV points.

(Van Horn, 1998)

Entitlements

Once AMC/DOF calculates the total MV points for each carrier or team, the responsibility then shifts to the Contract Airlift Branch, AMC/DOY, to compute the entitlement to AMC business for each carrier or team. Once carrier entitlements have been established, AMC/DOY negotiates and awards AMC's peacetime international airlift business (Cygan, 1998). AMC's Centralized Contracting Branch (AMC/LGC) is responsible for establishing uniform rates for international service (Caughman, 1998).

AMC/LGC negotiates fixed rates for peacetime business based on historical cost information provided by the carriers (Caughman, 1998). A memorandum of understanding (MOU) between AMC and CRAF carriers requires carriers receiving more than $3 million in AMC charter business to submit historical cost data. For FY99, twelve carriers fit into this category (AMC/LGCA, 1998:1). Failure of these carriers to supply cost information by the date specified in the CRAF contract can result in a one percentage point reduction in MV points for every day late, up to a maximum of a 30 percent reduction (FY98 CRAF Contract, 1997:H-18). Standard rates are designed to include reasonable profits and are first proposed by AMC/LGC (Caughman, 1998). Carriers are then given an opportunity to comment on AMC's proposed rates before they are finalized (Caughman, 1998). A summary of the Category B proposed and final rates for FY 98 are shown in Table 14.

Table 14: Category B Rates (FY98)

Category	Proposed Rate	Final Rate
Category B Passenger (Widebody)	6.708 cents per seat mile	6.991 cents per seat mile
Category B Passenger (Narrowbody)	7.974 cents per seat mile	8.707 cents per seat mile
Category B Cargo	26.367 cents per ton mile	27.836 cents per seat mile

(Wright, 1997)

Once the Fixed Buy dollar amount has been established, AMC/DOY breaks down the Fixed Buy into different airlift categories. The categories as well as an approximate percentage of the total Fixed Buy for each category are depicted in Table 15.

Table 15: Entitlement Categories

Category	Percentage of Fixed Buy	Sub –Categories
Category B Cargo	36%	Narrow Body
		Wide Body
Category B Passenger	46%	Narrow Body
		Wide Body I
		Wide Body II
Category B Combination	8%	
Category A (Scheduled Service) Cargo	8%	
Short Range*	2%	Passenger
		Cargo

* - The short-range Fixed Buy was eliminated in the FY99 contract (Wright, 1997)

An Example

To illustrate how the Entitlement Process works, we will walk through and example. To keep our example simple, we will assume that 60 percent of the Fixed Buy is for Category B Passenger airlift and 40 percent for Category B Cargo airlift. In actual calculations, all of the categories listed in Table 15, along with the corresponding percentages, would be used for determining entitlements. Our example also assumes only three entities make up the entire CRAF. Entities A, B, and C are assumed to have received 400, 600 and 1000 MV points respectfully.

The MV points for each entity are multiplied by the percentage of business in each category to determine how many points may be used for entitlement purposes in each category (see Table 16 below).

Table 16: CRAF Contract Award Procedures – Initial Allocation

Team (or individual air carrier)	Total MV Points (carrier or team)	Passenger Business 60%	Cargo Business 40%
A	400	240	160
B	600	360	240
C	1000	600	400
TOTAL	2000	1200	800

Unlike in the past, most air carriers today provide service in a single category, either passenger or cargo service, but rarely both. If an air carrier operates only passenger aircraft and not cargo, and they are not part of a team, then the MV points allocated in the cargo category are disregarded. For instance, if entity A has no passenger airplanes and entity B has no cargo airplanes, then entities A and B lose-out on 60 percent and 40 percent respectfully of the potential utility of their MV points. Table 17 depicts the revised allocation of points assuming entity A provides cargo service only and entity B provides passenger service only.

Table 17: CRAF Contract Award Procedures – Revised Allocation
Carrier/Team A – Cargo Only Carrier/Team B – Passenger Only

Team (or individual air carrier)	Team's (or carrier's) Total MV Points	Passenger Business 60%	Cargo Business 40%
A	400	--	160
B	600	360	--
C	1000	600	400
TOTAL	2000	960	560

Once each air carrier's point values are determined in each category, the percentage of business in each category that the carriers are entitled to is calculated by dividing the carrier's points in each category by the total usable points in each category. Table 18 shows the results of this step.

Table 18: CRAF Contract Award Procedures – Percentage of Business Entitled to
Team A – Cargo Only Team B – Passenger Only

Team (or individual air carrier)	Passenger Business 60%	Cargo Business 40%
A	--	28.6%
B	37.5%	--
C	62.5%	71.4%
TOTAL	100%	100%

The final step of the process is to multiply the actual dollar amount of airlift business against the calculated percentages to determine the dollar entitlement for each

carrier or team of carriers. Table 19 shows the example business award results when using the FY98 Fixed Buy figure of $335 million.

Table 19: CRAF Contract Award Procedures – Dollar amount of Business Entitlement
Team A – Cargo Only Team B – Passenger Only

Team (or individual air carrier)	Passenger Business	Cargo Business	Total
A	--	$38.3 M	$38.3 M
B	$75.4 M	--	$75.4 M
C	$125.6 M	$95.7 M	$221.3 M
TOTAL	$201 M	$134 M	$335 M

The same calculated percentages used to allocate entitlements to the Fixed Buy are also used to allocate business under the Expansion Buy. Moreover, during CRAF activation, after volunteers are taken into account, this same information is used to call up aircraft and assign missions using a pro-rata system (FY99 CRAF Contract Solicitation, 1998:Atch 9-4).

V. CRAF Participation Implications

The MV Process influences which carriers participate in the CRAF, what their level of commitment is, and which aircraft they commit. As a result, the MV Process can impact 1) the role of carrier teaming arrangements, 2) the shortfall in CRAF aeromedical evacuation lift capability, and 3) CRAF compliance with Global Air Traffic Management (GATM) requirements. The remainder of this chapter is dedicated to addressing each of these issues.

Teaming Arrangements

History. In 1987, Military Airlift Command (now AMC) introduced the concept of *Joint Ventures* as an incentive to entice carriers, particularly small-package carriers, to join the CRAF that might not otherwise do so (Schwartz, Beyer, McHamee, Smith and Ciucci, 1991:3; Molinari, 1998). A Joint Venture, now referred to as a teaming arrangement, is simply an agreement between two or more parties. Teaming arrangements are a common practice in business contracting. Within the air carrier industry, Federal Acquisition Regulation, Part 9.6, recognizes the validity of contractor teaming arrangements and promotes a stance of noninterference in teaming arrangement affairs (Jones, 1988). In CRAF contracting, teams are treated as a single entity, no matter how many carriers belong to the team.

In the early years of teaming arrangements, carriers were allowed to enter into multiple teaming arrangements. Today, carriers are permitted to be a member of only one

team. Due to this limitation and the advantages inherent in larger teams, the number of teams has remained relatively constant, only their size has increased. Table 20 provides a list of teaming arrangements since their introduction in 1987.

Table 20: History of Carrier Teaming Arrangements

Year(s)	Team
FY87	FedEx, World Airways
FY88	Air America, Connie Kalitta
	Flying Tigers, UPS, Tower Air
	Northwest Airlines, FedEx
	World Airways, Evergreen International
	World Airways, RAX
CY89	Flying Tigers, Tower Air, UPS, United Airlines
	Northwest Airlines, FedEx
	Pan Am, Evergreen International, Tower Air
	Pan Am, ASC, Connie Kalitta
	Pan Am, Connie Kalitta, American Trans Air
	Rosenbaum, CF Air Freight
	World Airways, Key, American Airlines, Evergreen International, Emery Worldwide, RAX
FY90-FY92	American Trans Air, Connie Kalitta
	FedEx, Northwest Airlines, Tower Air, UPS, Pan Am
	World Airways, American Airlines, Emery Worldwide, Evergreen International, Key
	Key, American Airlines
FY93	FedEx, Northwest Airlines, Continental Airlines, Southern Air Transport, American Trans Air
	World Airways, Rich International, Evergreen International, Emery Worldwide, Sun Country Airlines
	UPS, United Airlines, Tower Air, American International Airways, Burlington Air Express

Table 20 (continued)

Year(s)	Team
FY94	FedEx, Northwest Airlines, Southern Air Transport, American Trans Air
	World Airways, Rich International Airways, Evergreen International, Emery Worldwide, Sun Country Airlines
FY95	FedEx, Northwest Airlines, Southern Air Transport, International Charter Express, Air Transport International, American Trans Air
	American International Airways, Burlington Air Express
	World Airways, Rich International Airways, Emery Worldwide, Sun Country International
FY96	Fed Ex, Southern Air Transport, Air Transport International, American Trans Air
	Tower Air, Burlington Air Express, American International Airways, Carnival Airlines, Polar Air Cargo
	World Airways, Rich International Airways, Emery Worldwide, Miami Air International, Northwest Airlines, Continental Airlines
FY97	World Airways, Northwest Airlines, Rich International, Evergreen International, Emery Worldwide, Miami Air International, Southern Air Transport, USAir
	FedEx, Air Transport International, American Trans Air, Burlington Air Express, Polar Air Cargo
	Tower Air, American International Airways, Carnival Airlines, Sun Country Airlines, Trans Continental Airlines
FY98	World Airways, American Airlines, Continental Airlines, Emery Worldwide, Evergreen International, Miami Air International, North American Airlines, Northwest Airlines, Southern Air Transport, UPS, USAir
	FedEx, Air Transport International, American Trans Air, Atlas Air, Burlington Air Express, Polar Air Cargo
	Tower Air, Airborne Express, American International Airways, Carnival Airlines, Trans Continental Airlines

(AMC/DOYA, 1998)

In FY94, AMC added an option to allow CRAF carriers to exchange, barter, or sell MV points openly. This gave the carriers an alternative method of being compensated for MV points without having to be part of a team. The change was welcomed by the major scheduled passenger air carriers, for it allowed them to be

compensated for their contribution to the CRAF without having to take on the risk of additional liability that comes with joining a team.

Between FY94 and FY97, commitments to the CRAF increased by nearly 80 percent (Routh, 1997), and by 1997, passenger and cargo capacity exceeded JCS requirements. In light of the excess lift capacity, AMC elected to withdraw the provision permitting the unrestricted buying and selling of MV points for all segments of the CRAF except for the Aeromedical Segment, despite objections from some of the major air carriers (Green, 1998). Carriers within the Aeromedical Segment were permitted to continue to sell MV points because capacity in the Aeromedical Segment was still well below the requirement (Green, 1998).

Without an alternative method of selling MV points, teams became more inviting to many carriers. Carriers in teaming arrangements jumped from 18 in FY97 to 22 in FY98. Today, three large teams dominate the CRAF: the World Team, the FedEx Team, and the Tower Team. They are so named because World Airways, FedEx, and Tower Airlines are designated as the team leaders. The World Team has 11 members and is predominately made up of passenger carriers. The FedEx Team has six members, most of which are cargo carriers. The Tower Team has five members, with three cargo carriers, one passenger carrier, and one carrier that operates both passenger and cargo aircraft. Although varied in composition, each team has a mix of carriers, including some that fly no AMC mission and others that take on a significant amount of additional DoD business. Table 21 lists the carriers in each of the three large teaming arrangements.

Table 21: FY98 Teaming Arrangement

Team	Team Members	Passenger Carrier	Cargo Carrier	Percent of Revenues from DOD Business
World Team	World Airways	X	X	22.2%
	American Airlines	X		<5.0%
	Continental Airlines	X		0.6%
	Emery Worldwide		X	1.7%
	Evergreen International		X	27.9%
	Miami Air International	X		20.1%
	North American Airlines	X		13.6%
	Northwest Airlines	X	X	1.6%
	Southern Air Transport	X	X	29.6%
	UPS		X	<5.0%
	USAir	X		3.0%
FedEx Team	FedEx		X	0.6%
	Air Transport International		X	29.5%
	American Trans Air	X		11.1%
	Atlas Air		X	0%
	Burlington Air Express		X	0.7%
	Polar Air Cargo		X	7.1%
Tower Team	Tower Air,	X	X	15.4%
	Airborne Express		X	0%
	American International Airways		X	12.0%
	Carnival Airlines	X		0.8%
	Trans Continental Airlines		X	0.3%

(Pugh, 1998)

Requirements. Proposed teaming arrangements must be submitted to AMC/DOYA for approval. All teaming arrangements must be documented in a teaming arrangement agreement that defines the roles, responsibilities, and relationships of the parties involved (FY99 CRAF Contract Solicitation, 1998:L-7). The FY99 CRAF Contract Solicitation requires the following items be evident in any carrier teaming arrangement agreement submitted for CRAF participation [emphasis added]:

1. ***One designated and authorized party*** *to represent and bind the Contractor Team Arrangement in its dealings with the Government. This party shall submit and negotiate offers on basic and expansion for all members of the contractor Team Arrangement. This includes, but is not limited to, scheduling, and agreement on all scheduled service and CAT-B missions. This party must be a Part 121 carrier.*
2. ***The term of the agreement must correspond to the contract terms and period.*** *This means the entire period of the contract plus six (6) months and the entire period of any CRAF activation plus up to six (6) months thereafter.*
3. *The agreement should evidence* ***the commitment of aircraft by tail number*** *for the entire periods stated in subparagraph (2) above.*
4. *The agreement should evidence the availability of* ***four cockpit crews per aircraft*** *for the entire period.*
5. *The agreement* ***must not have any terms contrary to the terms of the contract.***
6. *Agreements entered into between offerors in response to the solicitation* ***must evidence joint and several liability*** *as to schedule reliability requirements as set forth in SECTION E, committed CRAF capability as set forth in SECTION C and Atch 8, and performance of missions and other contract services to include reprocurement costs for failure to provide service as specified in SECTION H. Agreements may specifically identify exclusions from joint liability of other debts or obligations of a member by the other members. With the exception of schedule reliability, agreements reflecting individual carrier liability replacing joint liability at trip departure time are acceptable.*
7. *The agreement* ***must evidence a Unity of Purpose between parties.*** (FY99 CRAF Contract Solicitation, 1998:L-7).

Impact on the CRAF. Although carriers may join a team for a variety of reasons, the primary reason is to buy and/or sell MV points. Within a teaming arrangement, carriers are not required to convert their MV points into peacetime business. Instead, carriers can sell their MV points to their team partners that wish to augment their normal commercial business with DoD business.

Traditionally, most major scheduled passenger air carriers, and some express package carriers, have not used their entitlement to DoD business to actually fly DoD missions. Due to their cost structure and nature of their business, most of these carriers have instead elected to use the teaming arrangement concept to turn over their entitlements to DoD business to non-scheduled air carriers in exchange for some sort of compensation. Through teaming arrangements, these smaller non-scheduled carriers gain access to additional business.

The amount of DoD business that a carrier can take on is limited by AMC. A CRAF carrier's revenue from DoD business must remain below 40 percent of their total revenues (FY99 CRAF Contract Solicitation, 1998:K-9). If an airline exceeds the 40 percent threshold, their future entitlements may be reduced (Cygan, 1998). This clause was introduced into the CRAF contract in 1964 to prevent carriers from becoming wholly dependent on government business (Cygan, 1998). In FY98, the airline with the highest percentage of revenue from DoD business was Southern Air Transport with 29.56 percent (Pugh, 1998).

During peacetime, a few non-scheduled carriers fly the bulk of peacetime DoD business, while most major air carriers concentrate on the commercial sector (Sznajder, 1998). Smaller non-scheduled charter carriers are generally more capable of adjusting to changing requirements and surges in business and are thus well suited for handling DoD business, while the major scheduled passenger and express package carriers have their aircraft on an extremely rigid schedule and are less inclined to take on DoD business.

Although only a handful of smaller carriers fly the bulk of DoD peacetime missions, most of the aircraft committed to the CRAF come from the major scheduled passenger and express package carriers, most of which do relatively little DoD business. Although these carriers rarely fly DoD missions in peacetime, they are contractually obligated to supply their airplanes, crews, and support structure during a CRAF activation, as they did well during Operation DESERT SHIELD/STORM.

In addition to providing a mechanism for carriers to be compensated for MV points that they do not want to use for themselves, teaming arrangements allow different types of carriers to pool their points to gain the maximum benefit from their contribution to the CRAF. If you refer back to Table 17 in the previous chapter, you can see that, acting independently, carrier A and carrier B's original combined MV point value of 1000 points yielded a combined point value of 520 MV points that could be used towards their entitlements. If carrier A and carrier B had formed a team and pooled their points, they could have gained full use of the entire 1000 MV points as depicted in Table 22.

Table 22: CRAF Contract Award Procedures – Carrier's A & B in a Team
Carrier/Team A – Cargo Only Carrier/Team B – Passenger Only

Team (or individual air carrier)	Team's (or carrier's) Total MV Points	Passenger Business 60%	Cargo Business 40%
A & B Team	1000	600	400
C	1000	600	400
TOTAL	2000	1200	800

If we use the same Fixed Buy amount of $335 million that we used earlier, acting as a team, A and B would now be entitled to $167.5 million in business, where as acting as independent carriers, their total entitlement would only be $113.7 million (refer to Table 17). As these figures illustrate, by pooling points within a team, carriers can receive benefit from more of their points.

To make the most of their pooled points, teams need to be diversified. The more categories of business a team operates in (Category B Passenger, Category B Cargo, Combination, Category A Cargo, and Short-range), and the greater variety of aircraft that a team operates (widebody and narrowbody), the more business the team will be entitled to. Moreover, an efficient teaming arrangement will be formed such that the amount of points team members want to sell closely equates to the amount members want to buy.

Advantages. Teaming arrangements benefit CRAF carriers in that they provide a mechanism for carriers outside the Aeromedical Segment to buy and sell MV points. Currently, if an air carrier outside the Aeromedical Segment of the CRAF elects not to use its entitlement, the only means by which it can be compensated for MV points is by entering into a teaming arrangement. In addition, if an air carrier wishes to take on more

DoD business than what they are entitled to based on their MV points, they must negotiate within a team to gain access to additional Fixed or Expansion Buy business.

Another advantage of teaming arrangements is that they allow carriers to build on each other's strengths. Many carriers in the CRAF have little, if any, experience flying DoD missions, while others are quite familiar with military operations. In addition, many smaller CRAF carriers have a limited capability to support operations on a worldwide basis, while others have an extensive enroute support structure. By permitting these carriers to team together, they can bring added capability to the CRAF during an activation.

The following quotes provide a description of the advantages of teaming arrangements from the perspective of two CRAF air carrier representatives:

> **Mr. Joseph Hrezo, Emery Worldwide**. *The advent of teaming arrangements facilitated the [CRAF] program's growth and today these agreements provide the foundation of a remarkably successful system whereby benefit can be shared among those carriers which wish to share in DoD's peacetime business as well as those who elect to contribute MV points to a Contractor Team for other consideration.* (Hrezo, 1998)

> **Captain Andrew Peters, US Airways.** *By pooling our points together as a team, we receive revenue from the peacetime business other team members complete. Additionally, we are able to get cargo business that exceeds other team member's capabilities.* (Peters, 1998)

Although teaming arrangements were introduced in CRAF contracting as an incentive for the carriers, AMC benefits from them as well. Teaming arrangements benefit AMC by providing additional avenues to recover damages in the event that an individual carrier defaults on their contractual obligations. Teaming arrangements also reduce the administrative workload in CRAF contracting.

By joining a team, members of a teaming arrangement become jointly and severally liable for some of the actions of other team members. For example, if carrier A and carrier B are in a team, and carrier A fails to provide service as the CRAF contract stipulates, AMC can recover damages from carrier B. Although AMC has never penalized a carrier in a teaming arrangement for the action of another team member, they came very close to doing just that when Rich International Airways was grounded by the FAA on August 30, 1996. As a member of the World Team, the Contract Airlift Administration branch at AMC went to World Airlines to see if another team member could cover Rich's flights (Rich, 1998). The World Team was unable to provide suitable aircraft to fly Rich's routes, and AMC was forced to go to a carrier outside the World Team to get replacements (Cygan, 1998; Rich, 1998). In this case, World was not asked to provide compensation to AMC because the replacement carriers flew the missions at the original rates. However, had AMC incurred any additional costs, they would have had the right to recover those costs from the World Team (Rich, 1998).

In addition to providing AMC with a means of recovery in the event of a contract default, the joint and several liability clause of the CRAF contract provides an incentive for team members to work together to avoid a breach of contract. According to Mr. William C. Jones, a member of AMC's legal counsel, "Teams may provide an additional measure of quality screening (no one wishes to share liability with a less than responsible partner), incentivize or assist members to avoid breach, discourage members from submitting unfounded claims, etc." (Jones, 1998).

Teaming arrangements also reduce the paperwork involved in CRAF contracting. Without teaming arrangements, AMC would be forced to administer 40 different Airlift Services Contracts, one for each member of the CRAF. Because teaming arrangements are treated as a single entity, a single contract applies to all the members of the team. For instance, the World Team has 11 members, but they are all covered by a single contract.

Disadvantages. A natural concern in most industries where teaming arrangements exist is that team members may conspire to fix prices and drive competitors out of the market. In the CRAF, however, business is allocated in a non-competitive way using standard fixed rates. The nature of the CRAF prevents teams from yielding power or influence against other teams. However, AMC policies concerning teaming arrangements have led to a situation whereby all other things being equal, a carrier acting independently may be at a distinct disadvantage when compared to carrier belonging to a team.

Currently, there exists no method by which carriers that act independently can be compensated for MV Points that they do wish to or cannot use. In addition, carriers that desire to take on additional business, above and beyond what their commitment entitles them to, have no other recourse but to join a team. Many carriers are in the position where they have no desire to be in a teaming arrangement, and would rather deal with AMC on a one-to-one basis, but they feel they must join a team to avoid being penalized. They feel forced into joining a team to be compensated for what they think they are already entitled to based on their commitment to the CRAF. The following quotes reveal some of the concerns about the growth of large teaming arrangements:

Mr. Bill Doherty, American Trans Air. *As long as teaming arrangements are allowed, and we want AMC business, we have no choice but to belong to one. If we weren't, we would have virtually no entitlement and we would get virtually no business. Teaming arrangements force smaller carriers to pay larger carriers to do the same, or in some cases, less business than they would be entitled to do if there were no teaming arrangements. But, as long as they [teaming arrangements] are permitted, the only choices are belong or to not fly.* (Doherty, 1998)

Mr. Matt Brinker, American International Airways. *I think that teaming arrangements should be eliminated from the contracting process. Traditionally, they haven't provided much benefit to AMC until this year when the unrestricted buying/selling of MV points was eliminated. The current situation forces carriers to join a team and sell points within the team in order to realize the same economic benefit experienced in prior years.* (Brinker, 1998)

Mr. Gary Molinari, FedEx. *Eliminate all teaming arrangements...there is no longer a valid reason to continue to have teaming arrangements.* (Molinari, 1998)

Aeromedical Airlift Shortfall

AMC has attempted to lure air carriers to commit additional Boeing B-767s to the Aeromedical Segment of the CRAF through modifications of the MV Process. First, AMC offers double MV points for each aircraft donated to the Aeromedical Segment. In addition, carriers are permitted to openly sell MV points gained from committing aircraft to the Aeromedical Segment. Despite the implementation of these initiatives, AMC has been unable to gain the commitments that they need.

Currently, there are 28 B-767s in the Aeromedical Segment of the CRAF. This is 16 short of the JCS requirement of 44. However, the JCS requirement is currently under review. Based on a recent Joint Medical Readiness Study, the requirement may change to somewhere between 31 and 38 airplanes (AMC/XP, 1998:Ch 2, 31; Van Horn, 1998).

Even if the requirement is lowered to within this range, the current aeromedical evacuation capability still falls short.

Part of the problem is that the Boeing B-767 is one of the most efficient and profitable airplanes for the airlines. Carriers are naturally hesitant to commit their premiere airplane to the CRAF without reasonable economic justification. American Airlines currently has 59 B-767s in the CRAF. However, they are all in the International Long-Range Segment and none are in the Aeromedical Segment (Quackenbush, 1998). According to Mr. Bill Quackenbush of American Airlines, American originally avoided the Aeromedical Segment due to safety concerns over the liquid oxygen portion of the AESS modification. Although still concerned about the safety of the oxygen system, American's major concern has shifted to the potential loss of revenue in the event of the Aeromedical Segment being activated during a contingency (Quackenbush, 1998).

Unlike any other segment of the CRAF, upon activation, aircraft in the Aeromedical Segment require an extensive modification, rendering the aircraft incapable of providing normal passenger service. Once modified, AMC would likely be very hesitant to approve de-modification until the conflict triggering the activation was resolved. This would leave the air carrier providing the aircraft without one of its most profitable aircraft for an extended period of time. Although the carrier would receive compensation from AMC for use of the aircraft during activation, the carrier risks losing market share due to an extended disruption of service.

Although the aeromedical capacity requirement may be lowered in the future, the shortfall in aeromedical lift remains a problem for AMC. The CRAF office at AMC is currently weighing options as to how to attack the problem (Bamberg, 1998).

GATM Compliance

The tremendous growth in air traffic presents a challenge to civil aviation authorities. In an effort to ensure the safe and efficient flow of air traffic, many of the world's civil aviation organizations such as the International Civil Aviation Organization (ICAO), and the FAA are implementing measures which would reduce aircraft separation requirements in many regions around the world. The DoD refers to this new concept of airspace management as Global Air Traffic Management (GATM). In conjunction with reduced aircraft separation requirements come stringent requirements for aircraft transiting the airspace to be equipped with expensive high-tech navigation, communication, and surveillance equipment. As shown in Table 23, GATM compliance began in 1997 and is expected to continue through the turn of the century.

Table 23: GATM Requirements

Effective Date	Requirement	Description	Applicable Location
March 1997	Reduced Vertical Separation Minima (RVSM)	Minimum separation between aircraft reduced.	North Atlantic Track System
April 1998	Required Navigation Performance (RNP) 5	Requires an aircraft to be within 5 NM of its cleared position 95 percent of the time during the duration of the flight.	European Core Airspace
April 1998	Required Navigation Performance (RNP) 10	Requires an aircraft to be within 10 NM of its cleared position 95 percent of the time during the duration of the flight.	Oceanic North Pacific Routes (Alaska to Japan)
December 1998	Required Navigation Performance (RNP) 10	Requires an aircraft to be within 10 NM of its cleared position 95 percent of the time during the duration of the flight.	Hawaii to Japan and Hawaii to West Coast Routes
January 1999	8.33 kHz Channel Spacing	New VHF radio channel spacing requirement to reduce radio frequency congestion.	Europe
January, 2000	TCAS/Mode S		Europe
February, 2000	Reduced Vertical Separation Minima (RVSM)	Minimum separation between aircraft reduced.	Pacific
September, 2000	Reduced Vertical Separation Minima (RVSM)	Minimum separation between aircraft reduced.	Europe
2003	Required Navigation Performance (RNP) 4	Requires an aircraft to be within 4 NM of its cleared position 95 percent of the time during the duration of the flight.	Oceanic
TBD	Required Navigation Performance (RNP) 1	Requires an aircraft to be within 1 NM of its cleared position 95 percent of the time during the duration of the flight.	Europe

(Halbert, 1998)

If aircraft are not equipped with the appropriate new technologies, they may be excluded from certain airspace. If not prohibited from flight, aircraft not GATM compliant may be relegated to flying non-optimum routes and altitudes, resulting in increased flight times, increased fuel consumption, and decreased payloads.

Civil carriers are keenly aware of the requirements going into effect, and most have plans to address the situation. Equipping aircraft with the latest technology required to operate on a global basis can be quite expensive. Therefore, air carriers generally avoid the expense of equipping their aircraft with the latest equipment when it is not required to operate in the region which the aircraft normally flies. As a result, many of the aircraft committed to the CRAF are not GATM compliant, and as the rules become stricter, AMC may be faced with a less capable CRAF.

If the CRAF is activated, the longer routes and lower altitudes non-compliant aircraft may be required to fly could result in delays in delivery of combat troops and equipment and may weaken a theater commander's posture during the critical first days of an operation. According to Colonel Murrell Porter, former Chief of AMC's Civil Air Division, by 2003, delays caused by GATM-noncompliant CRAF aircraft could cause a 30-day deployment stretch into a 38-day deployment (Porter, 1997).

AMC has taken the first step in addressing the problem by requiring CRAF carriers to submit GATM compliance data on each of their aircraft. In addition to providing the usual aircraft characteristics, the FY99 CRAF contract solicitation calls for air carriers to answer whether on not their aircraft are compliant in four areas: 1) RVSM

standards, 2) RNP-10 standards, 3) RNP-4 standards, and 4) 8.33 kHz VHF channel spacing (refer to Table 23 for definitions) (Quackenbush, 1998). Additional measures will be necessary to ensure the CRAF maintains a fleet of worldwide capable aircraft.

VI. Conclusion

The MV Process has proven to be a fundamentally sound and effective tool for gaining participation in the CRAF. The process allocates MV points to carriers in proportion to the number and type of aircraft, as well as to what stage of activation, they commit to the CRAF. Carriers can then use these MV points to gain a share of government air transportation business. Consequently, policy changes associated with the MV Process could have a direct impact on CRAF participation. This paper focused on three specific areas where the MV Process has had a major impact on CRAF participation: 1) teaming arrangements, 2) CRAF aeromedical evacuation capacity, and 3) CRAF compliance with GATM requirements.

Teaming Arrangements

Teaming arrangements provide a mechanism for carriers to share resources and build on each other's strengths. Teaming arrangements also benefit AMC by easing the administrative burden of CRAF contracting and opening up additional avenues for AMC to recover damages in the event of a contract breach. Despite the benefits of teaming arrangements, many carriers would prefer not to be part of a team to maintain their independence and avoid potential liability. However, AMC's decision to forbid the unrestricted buying and selling of MV points in 1997 has left carriers with a difficult decision concerning teaming arrangements. For many of the major air carriers, teaming

arrangements provide the only means of being compensated for their MV points, while many smaller charter carriers must enter into teaming arrangements to gain access to enough DoD business to remain profitable. This situation leaves the carriers with the choice of either joining a team or failing to accomplish their goals

One alternative to the current policy on the buying and selling of MV points that AMC may want to consider would be to permit the unrestricted buying and selling of points, but only for MV points gained from commitments of aircraft above and beyond the minimum level required to be in the CRAF. Under such a policy, carriers that would like to deal with AMC directly, rather than through a team, would have that option without being penalized. Permitting the buying and selling of MV points above the minimum would also increase the incentive for carriers to commit more than the minimum while providing them a financially sound alternative to teaming arrangements.

Under such a policy, carriers would still be awarded points based on their full commitment. However, they would only be allowed to sell MV points for aircraft committed above the minimum required to be in the CRAF (30 percent for passenger carriers and 15 percent for cargo carriers). For example, if carrier A's fleet of passenger aircraft equated to 100 WBEs, it would have to contribute at least 30 WBEs to join the CRAF. Assuming that 30 WBEs equates to 300 MV points, under this alternative, carrier A would not be allowed to sell any MV points unless it committed more than 30 WBEs. If carrier A contributed 60 WBEs, it would be permitted to openly sell 300 MV points, the amount of points from aircraft committed above and beyond the minimum.

If a carrier so desired, they could simply sell their MV points gained from commitment above the minimum, and not do any business with AMC, without ever having to join a team. In addition, carriers could use all of their MV points, and if they wanted even more AMC business, they could buy excess points from any other carrier that was willing to sell, all without joining a team. On the other hand, if a carrier chose to, they could still join a team to take advantage of the same benefits that teaming arrangements offer today. A comparison of the MV point-selling policy in effect from FY94 to FY97, the current policy, and the policy described above is summarized in Table 24.

Table 24: Comparison of MV Point-Selling Policies

	FY94-FY97	Current	Alternative
Buying and Selling of MV points	Unrestricted for all segments	Unrestricted for Aeromedical Segment, otherwise, only allowed within teams	Unrestricted for all segments, but only for points gained through commitments above the minimum required to be in the CRAF

Aeromedical Airlift Shortfall.

There is currently a shortfall in the CRAF's aeromedical evacuation lift capability. AMC has had difficulty in acquiring the required number of aircraft in the Aeromedical Segment for three main reasons. First, the B-767 aircraft is a highly efficient and profitable aircraft, and carriers are hesitant to commit them to the CRAF without reasonable compensation. Second, many of the carriers have safety concerns about the AESS oxygen system. Finally, the carriers are concerned about loss of market share in the event of a CRAF activation.

In recognition of the additional burden involved in offering aircraft to the Aeromedical Segment, AMC offers carriers double MV points for each aircraft committed to this segment. At first glance, double MV points for aircraft committed to the Aeromedical Segment may appear generous. However, due to the highly desirable nature of the Boeing B-767, the invasive nature of the AESS modification, and the potential loss of revenue and market share a carrier may experience during a CRAF activation, an increase in the bonus for commitment to the Aeromedical Segment may be warranted.

A moderate increase from the current factor of 2.0 to a new factor of 2.5 or 3.0 could be accomplished with relatively little negative impact. Of course, increasing the MV Point value for aircraft committed to the Aeromedical Segment will make the relative MV Point values for aircraft committed to the International Segment less. However, the current capability in the International Long-Range Segment of the CRAF is

126 percent of the passenger requirement and 146 percent of the cargo requirement, while the Aeromedical Segment's capability is just 64 percent of the requirement (AMC/DOF – Form 312, 1998). The excess capacity in the International Long-Range Segment could withstand any dip in participation caused by a moderate increase in the bonus for aeromedical aircraft. However, increasing the bonus for aeromedical aircraft beyond triple MV points could cause resentment among carriers outside the Aeromedical Segment and have a significant negative impact on the CRAF program.

An increase in the aeromedical MV Point bonus is just one step that AMC can take. In addition, AMC should continue to address carrier concerns about the safety of the AESS oxygen system. Furthermore, AMC should ensure that the proposed rate structure for the Aeromedical Segment is such that a carrier will make at least as much if not more during a CRAF activation than they would operating in the commercial sector.

GATM Compliance

The implementation of GATM requirements over the next few years represents one of the most significant changes in airspace management in the history of aviation. AMC needs to keeps pace with GATM changes in both the organic fleet and in the CRAF. Failure to do so may leave our nation with a less capable airlift fleet.

AMC should consider targeting GATM compliant aircraft by offering carriers more MV points for these aircraft. Implementing a bonus for aircraft that are GATM compliant, similar to the bonus for the B-747-400, MD-11, and B777, would provide an incentive to commit GATM compliant aircraft. By identifying aircraft capabilities and

actively targeting GATM compliant aircraft, AMC can limit the scheduling and airspace management problems that may occur in the event of a CRAF activation.

Future Research

An issue that warrants further research is the globalization of the air carrier industry and its impact on the CRAF. The nature of the air carrier industry is changing. An increasing number of US air carriers are entering into alliances with foreign carriers. As this trend continues, the distinction between what is considered a US carrier and what is considered a foreign carrier will become less clear. Because the CRAF is limited to US carriers, the lack of a clear distinction between US and foreign carriers may pose a problem for the future viability of the CRAF. Further investigation in this area would be helpful in identifying the potential pitfalls relating to the changing nature of the air carry industry.

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Vita

Major John A. Glaze was born 2 June 1964, in Madrid, Spain. He graduated from Rincon High School in Tucson, Arizona in 1982 and entered the University of Arizona. A Reserve Officer Training Corps distinguished graduate, he received a Bachelor of Science degree in Business Administration and a regular commission on 15 May 1986. On 2 April 1987 he earned his navigator wings by completing the first-ever Specialized Undergraduate Navigator Training course.

After initial C-130 navigator training at Little Rock AFB, Arkansas, he was assigned to Pope AFB, North Carolina, where he served as an AWADS navigator, tactics officer, and Special Operations Low Level II instructor navigator. During DESERT SHIELD/STORM, he flew 257 sorties transporting 749 tons of cargo and 542 passengers.

His next assignment was to Kirtland AFB, New Mexico where he flew as an evaluator navigator on the HC/MC-130P aircraft. He also worked as the Wing Chief of Flight Safety and Stand/Eval Flight Commander. While at Kirtland AFB, he earned a Master of Arts degree in Management from Webster University.

In May, 1997, Major Glaze was assigned to the Air Mobility Warfare Center as a Student in the Advanced Study of Air Mobility (ASAM) program. After graduation, he will be assigned as Chief, Special Airlift Plans, J-3 Directorate, Joint Special Operations Command, Fort Bragg, North Carolina.

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Air Mobility Command (AMC) attracts air carriers to commit aircraft to the Civil Reserve Air Fleet (CRAF) by linking participation in the CRAF to entitlement to Department of Defense airlift business. AMC uses the Mobilization Value (MV) Process to assign point values to CRAF aircraft based on their usefulness in meeting wartime requirements. Therefore, the MV Process has a significant impact on CRAF participation. AMC has modified the MV Process over time to keep pace with changing requirements. Further modifications may be warranted.

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