

USAWC STRATEGY RESEARCH PROJECT

**IMPACT OF INSUFFICIENT INTER-THEATER AIRLIFT ASSETS
ON
NATIONAL STRATEGIC DECISION-MAKERS**

by

Lieutenant Colonel James A. Barr
United States Air Force

Colonel Charles S. Voelker
Project Advisor

This SRP is submitted in partial fulfillment of the requirements of the Master of Strategic Studies Degree. The views expressed in this student academic research paper are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 03 MAY 2004		2. REPORT TYPE		3. DATES COVERED -	
4. TITLE AND SUBTITLE Evolution of Maritime Strategy Is Sea Power 21 the Answer?				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Steven Benner				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army War College, Carlisle Barracks, Carlisle, PA, 17013-5050				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT See attached file.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 26	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

ABSTRACT

AUTHOR: Lieutenant Colonel James A. Barr

TITLE: Impact of Insufficient Inter-theater Airlift Assets On National Strategic Decision-makers

FORMAT: Strategy Research Project

DATE: 19 March 2004 PAGES: 30 CLASSIFICATION: Unclassified

The purpose of this paper is to examine the limitations placed on national decision-makers due to limited inter-theater airlift resources. The paper will begin with national policy as it relates to air mobility, looking further at requirements as defined in the Mobility Requirements Study 2005. The paper will look at recent operations to determine lessons which can be learned from those experiences, and applied to future requirements. The paper will discuss efforts to address mobility requirements, to include pre-positioned forces, contracting with the Civil Reserve Air Fleet, procurement of C-17 aircraft and modernization of the C-5 fleet. The paper will analyze alternatives to address the inter-theater airlift capacity issue, and will recommend a strategy to meet airlift requirements.

TABLE OF CONTENTS

ABSTRACT.....	iii
IMPACT OF INSUFFICIENT INTER-THEATER AIRLIFT ASSETS ON NATIONAL STRATEGIC DECISION-MAKERS	1
STRATEGIC GUIDANCE/ENVIRONMENT	1
NATIONAL SECURITY STRATEGY	1
QUADRENNIAL DEFENSE REVIEW.....	1
STRATEGIC PLANNING GUIDANCE.....	1
DRAWDOWN OF OVERSEAS-BASED FORCES	2
AIRLIFT REQUIREMENTS	2
MOBILITY REQUIREMENTS STUDY 2005.....	2
RECENT OPERATIONS	4
AIRBORNE OPERATIONS	5
CARGO CATEGORY DEFINITIONS	5
CURRENT FORCE STRUCTURE	6
ORGANIC STRATEGIC AIRLIFT ASSETS	6
CIVIL RESERVE AIR FLEET	7
PRE-POSITIONED AFLOAT	8
ROADMAP TO SUFFICIENT INTER-THEATER AIRLIFT CAPABILITY	9
PROCUREMENT OF C-17S	9
MODIFICATIONS TO C-5 FLEET	9
COMMERCIAL APPLICATION OF MILITARY AIRCRAFT PROGRAM	11
FUTURE REQUIREMENTS.....	11
IMPACT OF TRANSFORMATION	11
LIMITED ACCESSIBILITY.....	12
CONCLUSIONS	13
ENDNOTES	17

BIBLIOGRAPHY23

IMPACT OF INSUFFICIENT INTER-THEATER AIRLIFT ASSETS ON NATIONAL STRATEGIC DECISION-MAKERS

STRATEGIC GUIDANCE/ENVIRONMENT

NATIONAL SECURITY STRATEGY

President George W. Bush, in the National Security Strategy (NSS) published in 2002, described a component of that strategy to be preemptive actions against terrorist organizations and enemies of the United States (U.S.) or its allies and friends to “prevent hostile acts by our adversaries.”¹ To support his strategy with the military element of national power, he said that the U.S. will “continue to transform our military forces to ensure our ability to conduct rapid and precise operations to achieve decisive results.”² The President called for “transformed maneuver and expeditionary forces” to ensure the nation is postured to defeat threats wherever they exist on the globe.³ Inter-theater mobility is a critical enabler to this strategy, since expeditionary forces must have the means to get where they are needed.

QUADRENNIAL DEFENSE REVIEW

The Quadrennial Defense Review (QDR), signed on 30 September 2001, clearly stated the purpose of the U.S. Armed Forces is “to protect and advance U.S. national interests and, if deterrence fails, to decisively defeat threats to those interests.”⁴ This review, conducted by the Office of the Secretary of Defense, provided the strategic policy that the U.S. Armed Forces must be able to engage in two major conflicts, halting the enemy in one theater while obtaining a decisive victory in the other, if the President so chooses.⁵ Secretary of Defense (SECDEF) Rumsfeld, in supporting the President’s NSS, called for “rapidly deployable and sustainable forces that can decisively defeat any adversary.”⁶ He specifically acknowledged a shortfall in strategic airlifters and readiness problems with the C-5 fleet.⁷ He stated that adjustments are required in the U.S. military posture to provide the necessary mobility assets, to include airlift, sealift and pre-positioning, to meet the deter and decisively defeat requirements if directed by the President.⁸ The previous Chairman of the Joint Chiefs of Staff, General Henry H. Shelton, recognized the reliance on inter-theater airlift, and called for an aggressive approach to increasing strategic airlift capacity.⁹

STRATEGIC PLANNING GUIDANCE

The Strategic Planning Guidance, successor to the Defense Planning Guidance, is in coordination for release by the SECDEF. The guidance will reinforce and expand policy as

outlined in the QDR, putting the 1-4-2-1 strategy described by Secretary Rumsfeld into Planning, Programming, Budgeting, and Execution System guidance. The number one priority of the Department of Defense (DoD) is to defend the homeland, number two is to deter forward in four theaters, number three is to swiftly defeat the efforts in two overlapping wars and the fourth priority is the option for decisive victory in one of those efforts, if the President so chooses. All of these requirements, in addition to supporting lesser contingencies, must be able to be met concurrently.¹⁰

DRAWDOWN OF OVERSEAS-BASED FORCES

The U.S. military at the end of World War II was dependent on heavy, armored units. The force structure policies evolved to rely on forward basing, in part due to the lack of sufficient inter-theater mobility capacity. The end of the Cold War saw major reductions in force structure and overseas basing.¹¹ The resulting posture requires a higher proportion of forces based in the continental U.S. This force posture has obvious impact on requirements for strategic mobility, as stateside-based troops are needed to engage in Areas of Responsibility worldwide.

AIRLIFT REQUIREMENTS

MOBILITY REQUIREMENTS STUDY 2005

The Mobility Requirements Study 2005 (MRS-05) was completed in November 2000 by the Joint Staff “in collaboration with the Office of the Secretary of Defense, the Unified Commands, and the Services,” to study mobility requirements to meet military taskings.¹² The Deputy SECDEF directed the study to focus on small-scale contingencies, peacetime presence and engagement missions, special operations, and threats from weapons of mass destruction in addition to the two nearly simultaneous Major Theater War (MTW) scenarios previous studies had considered.¹³ MRS-05 looked at two Defense Planning Guidance Illustrative Planning Scenarios to evaluate requirements. Southwest Asia/Northeast Asia and Northeast Asia/Southwest Asia were the dual MTW scenarios studied since they require the most inter-theater mobility. Effectively, this study considered a Korea and Iraq scenario, using forces programmed to be available in 2005 and threats the U.S. was projected to face in 2005.¹⁴

Any discussion on strategic mobility must recognize that the predominance of forces deployed to an MTW will travel by sea. MRS-05 identified that roughly 85 percent of unit equipment would ship by sea, while the remaining 15 percent of unit equipment and almost all of the personnel would be airlifted.¹⁵ For the two MTW scenario, the bulk of forces begin to arrive by ship in three weeks for Northeast Asia and four weeks for Southwest Asia.¹⁶

While shipping will transport the predominance of forces, MRS-05 identified that strategic airlift will be essential to meet warfighter timelines. The airlift requirement is driven by the halt phase of a joint force commander's campaign, but the buildup and counter-offensive phases gain flexibility by a robust airlift capability. MRS-05 identified 54.5 million ton-miles per day (MTM/D) as the airlift requirement to meet the overlapping MTW scenario and additional missions. 51.1 MTM/D is required for the MTW portion and 3.4 MTM/D is required for "conducting special operations, deploying missile defense systems to friendly nations and supporting other theater commanders not directly engaged in the theater campaigns."¹⁷ The 3.4 MTM/D additional requirements are essential to demonstrate U.S. resolve to our allies and potential enemies, reducing the probability of aggression against interests of the U.S. or its friends. Meeting all identified requirements would actually require an airlift capacity of 67 MTM/D. That robust capacity would permit optimistic timeline assumptions on advance warning, President and SECDEF decision-making, Ready Reserve call-up, commercial fleet activation, coalition support and warfighter closure requirements to be reduced to a less aggressive posture.¹⁸ The study accepted moderate risk, though, and concluded that 54.5 MTM/D is the minimum capability to meet the needs of the country.¹⁹

MTM/D is a metric which reflects the capacity of an airlift fleet. Shape, size and density of specific cargo will determine the amount of cargo that can be loaded onto an aircraft. In general, MTM/D is a product of the number of aircraft available, the airspeed the aircraft flies, the average payload and the number of hours per day the aircraft can be flown.²⁰ MTM/D is a valuable measure of airlift capacity, but is not all encompassing. Planners must understand that having the airlift capacity does not mean all of that capacity will be brought to bear on a specific situation. In the 1999 movement of Task Force Hawk into Albania, Rinas Airport was limited to a Maximum on the Ground (MOG) of only two C-17s at any time. Closure of the task force required a month, even though the airlift fleet had the capacity to move the people and equipment in a few days.²¹ The MOG is the number of a specific type of aircraft that can be on the ground at any given time, and may be driven by taxiways, parking space, refueling capability, and many other factors. Spare parts, material handling equipment such as forklifts and loaders, maintenance personnel, trained aircrews, fuel availability and the density of cargo all have a bearing on the capability, versus the capacity, an airlift fleet can provide.²²

Current airlift assets fall short of the 54.5 MTM/D requirement identified by MRS-05. The current fleet has a 13 percent shortfall for this wartime requirement, providing only 47.3 MTM/D.²³ This shortfall is optimistic since no planning factor is considered for inefficiencies in scheduling and command and control, and no delays are considered for infrastructure

congestion, bad weather, obtaining diplomatic clearances or restricted operating hours at airfields. An enemy's use of chemical weapons would also cause disruptions in the theater transportation infrastructure, substantially impacting inter-theater airlift and closure rates.²⁴

RECENT OPERATIONS

Inter-theater airlift has importance to strategic decision-makers beyond MTM/D capacity. Operation ENDURING FREEDOM (OEF) could not have been considered without airlift. Afghanistan, a land-locked country at least 400 miles from aircraft carriers, required airlift to deliver almost all personnel and equipment.²⁵ Almost the entire active fleet of inter-theater airlifters, approximately 140 C-5s and C-17s, were dedicated to operations supporting the effort in Afghanistan.²⁶ Beginning on the first day bombs were dropped, C-17s airdropped 17,000 humanitarian rations daily over northern Afghanistan. Those airdrops provided a strong diplomatic signal from Washington to the people of that country and the world community that the U.S. was targeting terrorists and those that harbor them, rather than the people of Afghanistan. Airlift was able to get the necessary combat and support forces in place quickly to meet the timeline set by the nation's leadership. This was important since the warfighting commanders could not afford a long delay in building up forces as had been seen in Operation DESERT SHIELD. General Charles T. Robertson, Jr., Commander of U.S. Transportation Command (USTRANSCOM) at the beginning of OEF, said that "the difference between this war and the Gulf War is the speed of the response required."²⁷

In Operation IRAQI FREEDOM (OIF), C-17s gave Washington "the power to open and sustain a northern front" when Turkey would not permit U.S. ground forces to use Turkish soil to invade Iraq. Fifteen C-17s airdropped 954 troops and equipment from the 173rd Airborne Brigade near Bashur on March 26, followed by an airland insertion of forces. Over 2,000 troops and equipment, including 5 M1A1 tanks, 5 Bradley fighting vehicles, 15 armored personnel carriers and 41 Humvees were airlifted directly to the fight.²⁸

While U.S. Air Force (USAF) airlift strengths were readily demonstrated in OEF and OIF, weaknesses were also highlighted. General Tommy R. Franks, Commander of U.S. Central Command, was "forced to modify his original war plan to live within USAF's constrained airlift fleet," having to make tough prioritization decisions on closure dates for various units and equipment for OIF. General John W. Handy, current commander of USTRANSCOM, said that when USTRANSCOM was validating General Franks' Iraqi war plan, "fairly substantial negotiations" were required due to limitations on available airlift.²⁹ General Franks could not

have all the forces he wanted in time for the major assault, and had to make tough choices on which forces were essential for each phase of the war.

The airlift fleet was fully employed during OIF. Ninety-one percent of the C-17 fleet and ninety-four percent of the C-5 fleet was operationally tasked in March 2003, the month OIF began. That level of effort required shifting aircraft from scheduled maintenance activities, training and other theaters of operations.³⁰ The inter-theater airlift fleet was challenged to meet many requirements in addition to the MTW in Iraq and ongoing OEF operations. Peacekeeping operations in Bosnia and Kosovo, stateside homeland defense requirements, Korea support and other regional combatant commanders all presented airlift requirements concurrently with the ongoing war.³¹

OEF, alone, was not an MTW as it relates to airlift. The amount of people and equipment did not require opening a large number of Forward Operating Locations, which would have required deploying a large number of support personnel and equipment to operate the transportation system. Air Mobility Command was not required to defer aircraft or depot maintenance, and was able to meet non-OEF requirements while supporting the efforts in Afghanistan.³²

AIRBORNE OPERATIONS

Strategic Brigade Airdrop is the most demanding airborne operation driving organic airlift capability. C-17s have assumed this mission from the retiring C-141 fleet. With the successful validation of dual-row airdrop capability, the C-17 fleet will be fully mission capable for this requirement upon delivery of 120 aircraft. The airdrop requirement, therefore, is less demanding than the overlapping MTWs and does not drive force structure.³³

CARGO CATEGORY DEFINITIONS

Bulk Cargo: "General cargo, typically preloaded on 463-L pallets (108 inches by 88 inches, 104 inches by 84 inches usable space) or containers and transportable by common cargo aircraft."³⁴

Oversize Cargo: "Cargo in a single item that exceeds the usable dimensions of a 463-L pallet of 108 inches long by 88 inches wide by 96 inches high in any dimension."³⁵

Outsize Cargo: "Cargo that exceeds the capabilities of C-130/C-141 aircraft and requires the use of a C-5 or C-17 aircraft. It is cargo that exceeds 810 inches long by 117 inches wide by 105 inches high in any dimension."³⁶ Between 41 to 55 percent of an Army mechanized

division's equipment is outsize. That compares with 26 to 33 percent of an infantry division's cargo being outsize.³⁷

CURRENT FORCE STRUCTURE

ORGANIC STRATEGIC AIRLIFT ASSETS

General Handy has clearly stated that the existing airlift fleet and mobility structure is only robust enough to support one MTW. OIF highlighted his concerns, since it was obvious throughout DoD that there would have been very difficult choices and priorities to be made had a second MTW started.³⁸

The inter-theater airlift force considered by MRS-05 consists of C-5 and C-17 aircraft. All C-141s have been retired from the active duty, and are programmed to retire from the air reserve component by 2006. The inter-theater airlift force structure fully employs the Total Force concept. The Air National Guard and Air Force Reserve Command (AFRC) hold 35 percent of the inter-theater airlift fleet. Both components are quickly called upon for major airlift flows. AFRC, for example, flew about 45 percent of OIF C-17 missions and 50 percent of C-5 missions.³⁹

The C-17 is a "heavy-lift, air refuelable cargo transport for inter-theater (strategic) and intra-theater (tactical) direct delivery airlift of all classes of military cargo, including outsize items." The C-17 can carry three AH-64A helicopters, three Bradley vehicles or one M1 tank. The aircraft can also be configured to carry 102 passengers and has a maximum gross weight of 585,000 pounds. The direct delivery capability of the C-17 enables the airlift of troops and equipment over strategic distances, delivering up to 170,900 pounds of payload to austere runways in the combat zone as short as 3,000 feet. The C-17 utilizes a fly-by-wire flight control system, and features Heads-Up-Displays to permit short field landings.⁴⁰ Direct delivery bypasses the need for tactical airlift or ground transportation to move troops and equipment from major aerial ports of de-embarkation to the front lines. A previous mobility study concluded this direct delivery doctrine provides a 7 to 15 percent reduction in closure times for a deployment to Southwest Asia.⁴¹ The C-17 has demonstrated mission capable rates in the mid-90 percent range, even maintaining an 88.2 percent mission capable rate during OIF.⁴² The Boeing Company production facility has delivered 112 of the 180 aircraft ordered.

The C-5 is a "heavy-lift, air refuelable cargo transport for massive strategic airlift over long ranges, including outsize cargo." There were 131 aircraft built, with 126 remaining in the inventory. There are 76 C-5A models, with one Air National Guard and two Air Force Reserve Command unit-equipped squadrons. There are 50 C-5B models, produced approximately

fifteen years after the A-model fleet. The C-5 has a wartime maximum gross weight of 840,000 pounds. Every combat equipment item in the Army inventory can be airlifted by the C-5. Potential payloads include "six Apache helicopters, two M1 main battle tanks, six Bradley vehicles," or three CH-47 helicopters. The aircraft can also be reconfigured to carry 340 passengers.⁴³ The C-5 can carry 300,000 pounds of cargo over short distances, with enough room for 36 pallets. It can carry 204,000 pounds of cargo strategic distances in excess of 2,530 statute miles.⁴⁴ While the C-5 is a very effective means to airlift great amounts of cargo, it has suffered from low reliability and maintainability rates.

CIVIL RESERVE AIR FLEET

The Civil Reserve Air Fleet (CRAF) leverages excess capacity in the commercial airline industry, with 927 aircraft from 33 carriers committed voluntarily to augment military capability.⁴⁵ Air Mobility Command (AMC), the USAF component of USTRANSCOM, offers economic incentives and peacetime contracts to attract and retain commercial carriers for the program.⁴⁶ The program, which has been in existence since 1952, assigns all aircraft to "one of five mission segments: long-range international, short-range international, Alaskan, domestic, and aeromedical."⁴⁷ Guaranteed contracts for fiscal year 2003 amount to \$394M, with \$224M estimated in additional contracts throughout the fiscal year.⁴⁸ The CRAF contribution to the 54.5 MTM/D requirement is limited to 20.5 MTM/D, and is planned to airlift 40 percent of all airlifted cargo, and approximately 95 percent of all personnel once the decision is made to activate that portion of the fleet. The 20.5 MTM/D equates to 120 Boeing 747-100 Wide-Body-Equivalents.⁴⁹ The CRAF can be activated in three stages: Stage I includes 5.6 MTM/D in cargo capacity, Stage II totals 13.57 MTM/D, and Stage III totals 20.5 MTM/D.⁵⁰ Stage I supports minor emergency operations and can be activated by the Commander of USTRANSCOM. Stage II supports more substantial airlift emergencies and requires approval of the SECDEF, while Stage III must be ordered by the SECDEF after the President or Congress declares a national emergency or war.⁵¹ The commercial industry has signed up for a total of 27.95 MTM/D, but only 20.5 MTM/D is considered for planning purposes. CRAF Stage III, therefore, has 7.45 MTM/D of excess capacity subscribed.

There is little risk for the foreseeable future in having enough commercial assets available to meet CRAF requirements. There are risks, however, in relying too heavily on the commercial sector. One risk is the political concern of activating the CRAF. The passenger-only portion of CRAF Stage I was activated for OIF, but it was only the second time the commercial aircraft had been activated.⁵² CRAF Stage I and Stage II were activated for Operation DESERT STORM.

MRS-05 assumes that CRAF Stage III is not activated unless the U.S. becomes involved in a second MTW due to the adverse impact such an activation would have on the U.S. economy. The airline industry identified many economic concerns following the CRAF activation during Operation DESERT STORM. The biggest issues raised included losses in the commercial market to non-participants in the program, peacetime rates not covering costs during war, war insurance and government indemnification for losses.⁵³ Another concern for relying too heavily on the CRAF is the concept of operations (CONOPS) for activation. The CONOPS requires that the commercial aircraft are not exposed to chemical weapons, since they are not equipped and crews are not trained to operate in that environment.⁵⁴ This limitation would certainly reduce options to the warfighters and USTRANSCOM, and potentially place the organic fleet in the position of being undersized for requirements. Too much reliance on commercial wide body aircraft would also reduce throughput for critical nodes in the airlift system, and potentially saturate the transportation infrastructure. While the CRAF does have some capacity to carry oversize cargo, outsize cargo can not be carried by commercial aircraft. Floor strength is another issue which limits certain heavy military combat equipment from being carried by commercial aircraft. Commercial aircraft in the CRAF also limit flexibility in operating locations, since they typically required 10,000 feet, paved runways.⁵⁵ Other operational concerns include utilizing civilian aircrews to conduct classified missions, or to operate into "austere or politically sensitive" airfields.⁵⁶

The CRAF was not activated for OEF. USTRANSCOM was able to hire enough volunteers to meet its needs, aided by reduced airline operations following 11 September 2001. One hundred commercial missions were contracted in the first month of operations, as compared to sixty-six for the entire 78-day conflict in Kosovo.⁵⁷ The CRAF was activated for OIF from 8 February to 18 June 2003. Eleven commercial airline carriers, flying 51 aircraft on more than 1,600 missions, airlifted more than 254,000 personnel. Sixteen commercial cargo carriers volunteered to transport 22,000,000 pounds of cargo to the AOR.⁵⁸

PRE-POSITIONED AFLOAT

Pre-positioned afloat assets are a critical component of the U.S. quick response capabilities. MRS-05 determined that programmed sea assets are adequate to meet requirements. It is of interest that all services depend upon the quick response mobility provided by 37 Military Sealift Command pre-positioning ships to transport supplies, equipment and fuel. The Marine Corps utilizes 14 ships to support a Marine Air-Ground task force of up to 17,400 troops for as much as 30 days. The Air Force uses three ships to supply munitions, the

Navy uses two ships for munitions and the Defense Logistics Agency uses three ships for storing fuel. The Army uses 15 ships to carry a heavy brigade with “two armored and two mechanized infantry battalions, port-opening gear, sustainment supplies and other support material.” These ships are at geographically strategic locations in the Mediterranean Sea, the Indian Ocean and in the western Pacific Ocean.⁵⁹

ROADMAP TO SUFFICIENT INTER-THEATER AIRLIFT CAPABILITY

PROCUREMENT OF C-17S

Additional C-17s need to be procured. General Handy has already stated that the requirements identified in MRS-05 require the 180 aircraft procurement of C-17s to be increased to at least 222 aircraft.⁶⁰ The Air Force wants to continue the current production rate of 15 aircraft per year.⁶¹ The results of C-5 modernization programs may impact the actual buy of C-17s required, since a lack of success in achieving improved reliability rates in the C-5 fleet may require even greater procurement of C-17s.

OEF was almost entirely supplied by airlift, with most of that being accomplished by the C-17. The C-17 is the only inter-theater aircraft capable of assault landings on unimproved landing zones, and conducting ground operations to include backing up and turning around on a 90 foot runway, taxiway or ramp. These capabilities delivering outsize and oversize cargo, combined with the C-17's high mission capability rate, made it “the weapon of choice” during OEF, according to General Handy.⁶² The warfighter demand for C-17s has been substantial. General Handy said that, “We have used, at times, every C-17 we own” to meet warfighters’ requirements.⁶³

While 222 C-17s and modernized C-5s will meet the MRS-05 MTM/D requirement, there is an additional concern about the number of aircraft available for scheduling. The programmed C-17s do not replace, one-for-one, all of the more than 250 C-141s being retired. While the programmed C-17 fleet exceeds the C-141 fleet's total capacity, the reduction in aircraft numbers reduces operational flexibility and increases the competition for valuable resources.⁶⁴ The next Mobility Requirements Study is expected to address the tail shortage issue in determining requirements.⁶⁵

MODIFICATIONS TO C-5 FLEET

The C-5 cargo aircraft is the largest aircraft in the U.S. inventory, and can carry every piece of Army combat equipment.⁶⁶ The C-5, however, has reliability issues. Mobility studies accomplished prior to MRS-05 were predicated on the C-5 achieving a 75 percent reliability

rate. MRS-05, recognizing current maintenance and logistics problems, used a 65 percent reliability rate for the C-5.⁶⁷ The C-5's actual reliability rate has been under 60 percent, in spite of a large increase in funding for spare parts. Two modernization programs are being considered to improve the C-5 fleet's reliability rate above 75 percent, with hopes to achieve an 85 percent rate.⁶⁸ The first is the C-5 Avionics Modernization Program, which is already funded for all 126 C-5s in the inventory and should be completed by the end of 2006. The second modernization program is the Re-engining and Reliability Program (RERP), which is an unfunded plan to improve reliability enough to warrant a fleet-wide upgrade.⁶⁹ The current plan is to modify one C-5A model and two of the newer C-5B models to determine if the modifications provide the intended reliability increases.⁷⁰ An Air Force review panel was established in November 2003 to study the merit of modernizing the C-5As. The Secretary of the Air Force is expecting the Air Force Fleet Viability Board to recommend retiring the C-5As when it makes its report in the March 2004 timeframe. Secretary James Roche told a congressional committee, "It's our hypothesis that the C-5As will prove to be too costly to maintain."⁷¹ The C-5As were delivered between 1969 and 1973, compared to the C-5Bs which were all delivered in the late 1980s.⁷²

There is substantial technical risk associated with the C-5 modernization programs. The RERP program is still being developed, and there is no guarantee that reliability will be substantially improved for either the C-5A or C-5B model. Additionally, there is scheduling risk for the balance between modernization of C-5s and procurement of C-17s. The results of the C-5 RERP program are expected to be known in time to extend the C-17 production line, if necessary. The modernization program, to include a "reliability, maintainability and availability analysis" must keep on track to provide the necessary data in 2007 to permit ordering of long lead items needed to keep the C-17 production line open.⁷³

The C-5 is an important part of the inter-theater airlift capability. It can continue to be a valuable part of the fleet if mission capable rates can be improved. The C-5 flew approximately 30 percent of all OEF missions, delivering almost 48 percent of the cargo. Similarly, it flew 23 percent of all OIF missions, again delivering about 48 percent of the cargo. The C-5, which carries over 250,000 pounds of cargo, continues to be a very efficient platform when it flies.⁷⁴

Mobility planners have utilized creative scheduling to optimize the C-5's strengths versus weaknesses. They were only scheduled, in support of OEF, into large airfields with enough ramp space to continue operations with a broken wide body aircraft consuming a parking spot. The missions were typically scheduled as engine running offloads/onloads, where the aircraft would keep its engines running during the entire ground stop, minimizing ground time and risk of

breaking down. Even with these scheduling tactics, C-5 reliability problems repeatedly impacted throughput. In a four day period in the first month of OEF, 20 percent of the C-5s supporting the war broke down, distressing the transportation infrastructure. Schedulers routinely scheduled a backup aircraft, tying up two aircraft for one mission, if the priority of the cargo required a high probability of mission accomplishment.⁷⁵

COMMERCIAL APPLICATION OF MILITARY AIRCRAFT PROGRAM

In addition to procurement and modernization of organic assets, the USAF created the Commercial Application of Military Aircraft program to encourage commercially owned aircraft which can augment DoD outsize and oversize airlift requirements. The program encourages the Boeing Company to build a commercial variant of the C-17, the BC-17X, to be procured with private funds and government subsidies. The government subsidy would ensure commitment of these aircraft to support DoD in time of need. An Air Force sponsored study indicated the aircraft would be commercially viable, fitting into a global market currently dominated by non U.S. firms. It is estimated that this program could save taxpayers \$8B if successful.⁷⁶

FUTURE REQUIREMENTS

IMPACT OF TRANSFORMATION

The Pentagon conducted a transformation study in 2001 which proposed that the U.S. military be able to gain control of the situation, anywhere in the world, within 24 hours. It also proposed the military should be able to win an MTW in 30 days. The subordinate changes and goals proposed by all the services to meet those challenges would overwhelm the nation's airlift capacity.⁷⁷ The Army, attempting to transform itself to support DoD, has set the requirement that a brigade must be able to respond anywhere in the world in 96 hours, a division in 120 hours and five divisions in 30 days. The 96-hour response brigade would have to rely on airlift. Airlift and fast ships would be required for the division and five division responses.⁷⁸ Congress' General Accounting Office issued a report concluding that transporting the Army's new Stryker brigades would heavily burden the airlift system, requiring approximately one-third of all C-17s and C-5s.⁷⁹ While General Handy supports the services' efforts to set timelines for force readiness, he understands that the combatant commanders determine the flow of personnel and equipment into their theaters. Major General Charles S. Mahan, Jr., from Army Material Command, acknowledged the competition for airlift when he said "the Army cannot expect that its needs will always be at the top of the priority list."⁸⁰ The warfighting combatant commanders, through the Time-Phased Force Deployment Data, determine the priorities and order for people

and equipment to arrive.⁸¹ Army planners should expect that getting airlift assets will be very competitive, especially in the early phases of conflict.⁸² It is clear, though, that ongoing transformation in the U.S. Army will have obvious impact on the airlift fleet required. The new ways airlift is used in modern warfare also impacts the situation. The speed at which ground forces have conducted operations during OEF and OIF, the rapid transport of special operations forces within a theater of operations, and overcoming access shortages due to lack of adequate ports of entry bring new challenges for the supporting transportation system.⁸³ Another mobility requirements study is needed to consider the changing environment and accurately identify current and future airlift requirements.

U.S. Army and Air Force modernization and transformation are somewhat interdependent. The future Army will depend on airlift for rapid mobility. As stated by General Mahan, "You are not relevant if you can't get to the fight." The Future Combat System (FCS) will be "a common vehicle or system of vehicles whose variants will serve as main fire-support vehicles, troop carriers, engineer and transport vehicles, and perhaps self-propelled, indirect-fire-support platforms." The intent is that the FCS is light and small enough to improve mobility, but heavy enough to face threats now met by tanks and armored vehicles. These lighter, mobile forces could be augmented with heavier mechanized forces if the situation and time permit.⁸⁴ This concept of deploying lighter, leaner forces would greatly reduce the logistical footprint required to supply large mechanized units.⁸⁵

LIMITED ACCESSIBILITY

Future military transportation options may be limited due to accessibility in remote parts of the world. Any major operations in sub-Saharan Africa, for example, would challenge the nation's capability to deliver and sustain large forces. These problems could constrain the national leaders' options to impact a given situation. American foreign policy and efforts in Africa have not been as engaged as in other regions, with more emphasis on other parts of the world considered to be of greater vital interest to the U.S.⁸⁶

U.S. national policy may lead directly to sub-Saharan operations in the global war on terrorism. Poverty, ethnic tensions, epidemic Acquired Immunodeficiency Syndrome rates, unfair resource distribution among the population, the inability of governments to provide for the needs of the people and political instability all help to create an environment susceptible to the recruitment of terrorists. The potential for failed states in the region increases the potential for safe havens for terrorist organizations. U.S. military operations could be severely impacted by the lack of access to adequate airfields and limited infrastructure to support mobility operations.

Only 65 percent of 286 major airfields in Africa can support C-17 operations. Adequate airfields, sufficient ramp space and fuel availability, and force protection are significant issues which could limit strategic options. Lessons learned from OEF beddown of airlift aircraft need to be applied to other remote regions such as sub-Saharan Africa. Mutual agreements and host nation support infrastructure should be addressed by the combatant commanders to ensure access in a future time of need.⁸⁷

CONCLUSIONS

Difficult choices need to be made to address the inter-theater airlift shortfall. Fiscal realities make these decisions more difficult, as services compete among themselves and internally to fund all the requirements to field the capabilities needed by the nation. Balancing funding for infrastructure, the F/A-22, the Joint Strike Fighter (F-35), additional C-17s and space assets, while continuing to operate at a high operations tempo (OPTEMPO), is a challenging task for USAF and DoD leadership. Combatant commanders and sister service chiefs of staff may have different priorities than the Secretary and Chief of Staff of the Air Force. Internally to the USAF, major commands have different perspectives as to which capabilities are most critical and warrant a higher funding priority. Currently, 180 C-17s have been programmed and are under contract to be built by Boeing.⁸⁸ A fleet of 222 C-17s and 50 C-5Bs will meet the 54.5 MTM/D requirement identified by MRS-05. Any number of C-17s less than 222 will require some number of C-5As to be upgraded and attain a reliability of 65 percent.⁸⁹

USTRANSCOM must have the organic assets to provide the flexibility to move all types of combat equipment under a full spectrum of combat conditions, to include chemical and biological environments. This organic fleet, in concert with a robust civilian augmentation in wartime, will provide the mobility to deploy forces forward. The second and third order effects of not having the necessary organic airlift fleet will limit the options available to the President to respond to threats worldwide.

USAF and DoD leaders must obtain funding for the acquisition of at least 222 C-17s, and modernization of the C-5B fleet to attain at least a 65 percent reliability rate. This number should be re-evaluated when better data is available on the C-5 modernization program results. The high OPTEMPO of recent operations will have a long-term impact on the existing airlift fleet. The high utilization rates the C-17s are experiencing during OEF and OIF are "aging even our newest systems much faster," according to General Handy. We are using spare parts and flying hours at a rate higher than planned, and that will have fiscal impact for parts and new aircraft at some point in the future.⁹⁰

The requirement of 54.5 MTM/D, identified in MRS-05, must be continuously re-evaluated to ensure an adequate airlift fleet. The global environment has clearly changed since 11 September 2001. The NSS signed by President Bush in 2002 shifted the strategy of the U.S. to one of preemption. The U.S. must be postured to react to threats, or future threats, wherever they exist and before they have developed to the point that an imminent danger exists. U.S. forces must prepare for deployments by developing assets and capabilities reflective of expeditionary forces.⁹¹ MRS-05 was conducted prior to 11 September 2001, and prior to the stand-up of U.S. Northern Command. Airlift requirements have undoubtedly increased since the study was completed in November 2000. General Handy has tasked the AMC staff to determine the number of C-17s that would have been required to meet General Frank's airlift requirements as he first presented them for OIF, prior to negotiations over unit and timeline priorities.⁹² That number needs to be factored into the next mobility requirements study.

Future studies must also consider the requirements and risks for the transportation infrastructure associated with the airlift fleet. Airlifting a deployable Army will require sufficient aerial ports of debarkation. C-5s require runways approximately 8,300 feet long, while C-17s only need 3,000 feet. Volunteer or activation of CRAF aircraft will typically require at least 10,000 feet of runway. Any large airlift will bring requirements for large parking ramps and, dependent on geographical location, large supplies of jet fuel. MRS-05 also identified a shortage in ground transportation to move personnel and equipment to ports in the CONUS, and from ports forward within theaters of operation.⁹³ All of these issues must be addressed.

The U.S. must ensure that inter-theater mobility capability supports the national strategy. Insufficient airlift and sealift capacity cannot be allowed to remove options from national decision-makers. Surge sealift capacity, including fast sealift ships, roll-on/roll-off ships and the U.S. Maritime Administration's Ready Reserve Force, is the backbone of getting ground forces to a large, sustained fight.⁹⁴ The Voluntary Intermodal Sealift Agreement Program, a commercial sealift program similar to the CRAF program, will continue to provide critical transportation capacity.⁹⁵ These programs, in addition to pre-positioning and inter-theater airlift capacity, must be continuously re-evaluated to ensure forces can get to the fight as needed by combatant commanders.

According to Lieutenant Colonel Charles Miller, an airlift doctrine historian, airlift is "much more than a transportation mode, it is an instrument of policy and warfighting tool. It readily and just as easily provides movement for international peacekeeping bodies, removes refugees from danger, and moves disaster relief goods and services. Its appearance at airfields throughout the world signals interest and commitment."⁹⁶ The nation must continue to invest in inter-theater

airlift to support the President's national security strategy. Inter-theater airlift is a critical enabler of an expeditionary force. It is essential that the U.S. has the airlift capacity to continue to get the forces to the fight quickly. As General Charles Wald, Deputy Commander of U.S. European Command said, "That's the big difference between us and other countries; we can get anywhere we need rapidly."⁹⁷ The U.S. must invest wisely to ensure that insufficient inter-theater airlift assets do not limit options for the nation's strategic decision-makers.

WORD COUNT=6,035

ENDNOTES

¹ George W. Bush, *The National Security Strategy for the United States of America* (Washington, D.C.: The White House, September 2002), 15.

² Ibid., 16.

³ Ibid., 30.

⁴ Donald H. Rumsfeld, *Quadrennial Defense Review Report* (Washington, D.C.: The Department of Defense, September 2001), 2.

⁵ Ibid., 17.

⁶ Ibid., 12.

⁷ Ibid., 8.

⁸ Ibid., 26.

⁹ Ibid., 69.

¹⁰ Buck Jones, "Presenting the Air & Space Expeditionary Force," briefing to Air Force officers, Carlisle Barracks, PA, U.S. Army War College, July 2003, cited with permission of Colonel Jones.

¹¹ Timothy S. Reed, "Air Mobility: Simultaneous Enhancement of Airpower Legitimacy and Security Dilemma Amelioration," *Air Force Journal of Logistics*, vol. XXVI, no. 1 (Spring 2002): 27.

¹² Joint Chiefs of Staff, *Mobility Requirements Study 2005* (Washington, D.C.: U.S. Joint Chiefs of Staff, November 2000), Ch. 1, Sect. VIII.

¹³ Ibid., Introduction.

¹⁴ Ibid., Scope.

¹⁵ Ibid., Airlift.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ John Handy, *Air Mobility Strategic Plan 2002 Update* (Scott Air Force Base: Air Mobility Command, September 2002), Para. 2.3.

¹⁹ John A. Tirpak, ed., "Mobility Boom," *Air Force Magazine*, June 2002, 29.

²⁰ Joint Chiefs of Staff, Airlift

²¹ Robert C. Owen and Todd A. Fogle, "Air Mobility Command and the Objective Force: A Case for Cooperative Revolution," *Military Review* (January-February 2001): 14.

²² Joint Chiefs of Staff, Airlift.

²³ Robert S. Dudney, ed., "The Mobility Edge," *Air Force Magazine*, August 2003, 2.

²⁴ Handy, Para. 2.3.

²⁵ Richard J. Newman, "Tankers and Lifters for a Distant War," *Air Force Magazine*, January 2002, 57.

²⁶ *Ibid.*, 58.

²⁷ *Ibid.*, 57.

²⁸ John A. Tirpak, ed., "The Squeeze on Air Mobility," *Air Force Magazine*, July 2003, 26.

²⁹ *Ibid.*, 24.

³⁰ Dudney, 2.

³¹ Tirpak, "The Squeeze on Air Mobility," 24.

³² Tirpak, "Mobility Boom," 28.

³³ Handy, Para. 2.3.

³⁴ *Ibid.*, Para 1.3.1.1.1.

³⁵ *Ibid.*

³⁶ *Ibid.*

³⁷ Charles Miller, *Airlift Doctrine* (Maxwell Air Force Base: Air University Press, 1988), 397.

³⁸ Tirpak, "The Squeeze on Air Mobility," 24.

³⁹ Adam J. Hebert, "Total Force in a Search for Balance," *Air Force Magazine*, September 2003, 34.

⁴⁰ "Air Force Almanac: Strategic Transports," *Air Force Magazine*, May 2003, 171.

⁴¹ Miller, 404-405.

⁴² Tirpak, "The Squeeze on Air Mobility," 26.

⁴³ "Air Force Almanac: Strategic Transports," 171.

⁴⁴ Owen, 16.

⁴⁵ Amy Svitak, "Curbs Sought on DoD Contracting With Foreign Civil Air Carriers," *National Journal's Congress Daily AM* (29 October 2003).

⁴⁶ Owen, 14-15.

⁴⁷ Frank Oliveri, ed., "When the Airlines Went to War," *Air Force Magazine*, October 1991, 83.

⁴⁸ Svitak.

⁴⁹ Handy, Para. 2.3.

⁵⁰ Joint Chiefs of Staff, Airlift.

⁵¹ Oliveri, 83.

⁵² Suzanne Chapman, ed., "US Ends CRAF Call-Up," *Air Force Magazine*, July 2003, 11.

⁵³ Richard Mackenzie, "More Stormy Weather for the Airlines," *Air Force Magazine*, March 1992, 70.

⁵⁴ Joint Chiefs of Staff, Airlift.

⁵⁵ Owen, 15.

⁵⁶ Handy, Para. 2.3.

⁵⁷ Newman, 58.

⁵⁸ Chapman, 11.

⁵⁹ Frank B. Randall, "A Revolution in Power Projection: Ready, Set, Go!" *Military Review* (January-February 2001): 20-21.

⁶⁰ Dudney, 2.

⁶¹ Tirpak, "Mobility Boom," 29.

⁶² *Ibid.*, 27.

⁶³ *Ibid.*, 28.

⁶⁴ Owen, 16.

⁶⁵ Tirpak, "Mobility Boom," 28.

- ⁶⁶ "Air Force Almanac: Strategic Transports," 171.
- ⁶⁷ Joint Chiefs of Staff, Airlift.
- ⁶⁸ Tirpak, "Mobility Boom," 29.
- ⁶⁹ Glenn W. Goodman, Jr., "C-5 Transport Modernization," *Armed Forces Journal* (October 2003): 28.
- ⁷⁰ Tirpak, "Mobility Boom," 29.
- ⁷¹ James Merriweather, "C-5A Galaxy Jets' Future Being Studied," *The News Journal* (5 November 2003).
- ⁷² Goodman, 28.
- ⁷³ Tirpak, "Mobility Boom," 29.
- ⁷⁴ "Strategic Airlift: The C-5 Galaxy," *Air & Space Power Journal* (Fall 2003): 36.
- ⁷⁵ Newman, 59.
- ⁷⁶ Sheila R. Ronis, "Commercial C-17 Could Help Military Mobility," *National Defense* (October 2003): 40.
- ⁷⁷ Tirpak, "Mobility Boom," 31.
- ⁷⁸ Owen, 12.
- ⁷⁹ Adam Hebert, "GAO: Strykers will Overtax Airlift," *Air Force Magazine*, September 2003, 19.
- ⁸⁰ Owen, 14.
- ⁸¹ Tirpak, "Mobility Boom," 31.
- ⁸² Owen, 18.
- ⁸³ Tirpak, "The Squeeze on Air Mobility," 24.
- ⁸⁴ Owen, 11-12.
- ⁸⁵ *Ibid.*, 13.
- ⁸⁶ Brian K. Hall, "Air Expeditionary Access: The African Connection," *Air & Space Power Journal* (Fall 2003): 49.
- ⁸⁷ *Ibid.*, 51-52.

⁸⁸ Dudney, 2.

⁸⁹ Handy, Para. 2.3.

⁹⁰ Tirpak, "Mobility Boom," 28.

⁹¹ Bush, 30.

⁹² Tirpak, "The Squeeze on Air Mobility," 26.

⁹³ Joint Chiefs of Staff, Executive Summary, 5.

⁹⁴ Randall, 20.

⁹⁵ Ibid., 24.

⁹⁶ Miller, 370.

⁹⁷ Dudney, 2.

BIBLIOGRAPHY

- "Air Force Almanac: Strategic Transports." *Air Force Magazine*, May 2003, 171-172.
- Bush, George W. *The National Security Strategy for the United States of America*. Washington, D.C.: The White House, September 2002.
- Chapman, Suzann, ed. "US Ends CRAF Call-Up." *Air Force Magazine*, July 2003, 11.
- Dudney, Robert S., ed. "The Mobility Edge." *Air Force Magazine*, August 2003, 2.
- Goodman, Glenn W., Jr. "C-5 Transport Modernization." *Armed Forces Journal*, October 2003, 28.
- Hall, Brian K. "Air Expeditionary Access: The African Connection." *Air & Space Power Journal* (Fall 2003): 47-54.
- Handy, John. *Air Mobility Strategic Plan 2002 Update*. Scott Air Force Base: Air Mobility Command, September 2002.
- Hebert, Adam J., ed. "GAO: Strykers will Overtax Airlift." *Air Force Magazine*, September 2003, 19.
- Hebert, Adam J., ed. "Total Force In a Search for Balance." *Air Force Magazine*, September 2003, 32-37.
- Joint Chiefs of Staff. *Mobility Requirements Study 2005*. Washington, D.C.: U.S. Joint Chiefs of Staff, November 2000.
- Jones, Buck. "Presenting the Air & Space Expeditionary Force." Briefing to Air Force officers. Carlisle Barracks, PA, U.S. Army War College, July 2003. Cited with permission of Colonel Jones.
- Mackenzie, Richard. "More Stormy Weather for the Airlines." *Air Force Magazine*, March 1992, 70-73.
- Manske, Chad T. "Looking Ahead: Future Airlift." *Air Force Journal of Logistics*, vol. XXVI, no. 1(Spring 2002): 12-21.
- Merriweather, James. "C-5A Galaxy Jets' Future Being Studied." *The News Journal* (5 November 2003).
- Miller, Charles. *Airlift Doctrine*. Maxwell Air Force Base: Air University Press, 1988.
- Newman, Richard J. "Tankers and Lifters for a Distant War." *Air Force Magazine*, January 2002, 56-60.
- Oliveri, Frank, ed. "When the Airlines Went to War." *Air Force Magazine*, October 1991, 83.
- Owen, Robert C., and Todd A. Fogle. "Air Mobility Command and the Objective Force: A Case for Cooperative Revolution." *Military Review*, January-February 2001, 11-19.

- Randall, Frank B. "A Revolution in Power Projection: Ready, Set, Go!" *Military Review*, January-February 2001, 20-25.
- Reed, Timothy S. "Air Mobility: Simultaneous Enhancement of Airpower Legitimacy and Security Dilemma Amelioration." *Air Force Journal of Logistics*, vol. XXVI, no. 1 (Spring 2002): 22-30.
- Ronis, Sheila R. "Commercial C-17 Could Help Military Mobility." *National Defense* (October 2003): 40.
- Rumsfeld, Donald H. *Quadrennial Defense Review Report*. Washington, D.C.: The Department of Defense, September 2001.
- "Strategic Airlift: The C-5 Galaxy." *Air & Space Power Journal* (Fall 2003): 36.
- Svitak, Amy. "Curbs Sought on DoD Contracting With Foreign Civil Air Carriers." *National Journal's Congress Daily AM* (29 October 2003).
- Tirpak, John A., ed. "Mobility Boom." *Air Force Magazine*, June 2002, 26-31.
- Tirpak, John A., ed. "The Squeeze on Air Mobility." *Air Force Magazine*, July 2003, 22-29.