Viewing Rapid Global Mobility as a Revolution in Military Affairs

by

Col David F. Todd, HQ AMC/XPX
Maj Phil Bossert, USTRANSCOM/TCJ8-P

> The complexities of the new world order already are placing a premium on airlift, which long has lived in the shadows of its more glamorous bomber and fighter forces. But since February 1991 there has been little air-to-air combat and few bombs dropped in anger. Even with the movement of so many fighters and bombers to Iraq [in 1994], the role of airlift has moved into the spotlight and likely will stay there.[1]

A new era in rapid global mobility has arrived because of advancements in operational and organizational concepts and the use of high technology. These advancements can be viewed as revolution in military affairs in regards to rapid global mobility. While global mobility has been a strength of US force, rapid global mobility is more important than ever to national military strategy in the post-Cold War environment.

Rapid global mobility is one of six US Air Force core competencies in Global Engagement: A vision for the 21st Century Air Force. Rapid global mobility provides the nation its global reach, a prerequisite for global power, and is the enabler of a majority of the other five core competencies--air and space superiority, global attack, precision engagement, information superiority, and agile combat support.[2]

Global Engagement supports the Chairman of the Joint Chiefs of Staff's concept of how we will fight in the early 21st Century called Joint Vision 2010. JV 2010 states that full spectrum dominance is the key characteristic of the 21st century Armed Forces and is attained through the operational concepts of dominant maneuver, precision engagement, full dimensional protection, and focused logistics, all of which will allow the US to dominate the full range of military operations. The critical need for rapid global mobility is stated throughout JV 2010, and forces that contribute to deterrence and warfighting capabilities must rely on power projection achieved through rapid strategic mobility.[3]

Rapid global mobility is not just an Air Force force-multiplier, but is a crucial enabler of joint and multinational operations. While Global Engagement and JV 2010 help provides for the ascendancy of RGM in US defense strategy, the reality of the post-Cold War era is proof this ascendancy is of a revolutionary nature.

Increased Importance of Rapid Global Mobility

There are six major reasons rapid global mobility has grown in perceived importance. However, true professional militaries have long understood its importance, both tactical, operational, and strategic.

1. The information revolution. The huge technical advances ushered in by this revolution and their impact on mankind are as profound as the industrial and agricultural revolutions. With most of the world now linked by hundreds of thousands of miles of fiber optic cable and hundreds of satellites, the speed of conflict escalation has accelerated. And with this has come the need for military forces to react with lightning speed. Air mobility forces can quickly bring sustained firepower anywhere on the globe.

2. The military drawdown. Keeping with American tradition, the US military is being downsized as a result of the end of the Cold War and mounting budgetary demands. With a smaller active duty force of 1.4 million, the ops tempo of US-based units will continue to increase. By 1999, eighty percent of US forces will be CONUS based, increasing the need for rapid power projection overseas. The air mobility bases which ring both coasts--McGuire, Andrews, Dover, Charleston, McChord, and Travis, among others, now serve the same mission as the 17th and 18th century forts such as Hamilton, Monroe, and Charleston--bastions of defense protecting the US and its interests.

3. Lean logistics. Labeled as "just in time logistics," lean logistics was forced by the closing of depots and the need to save money by decreasing inventory. Operations such as "Desert Express, European Express, Bosnia Shuttle" have become representative of this concept, and air mobility forces--both airlifters and tankers--provide this crucial and often life-sustaining service of critical personnel and sustainment to forward deployed forces.

4. Globalization. This is the increasing interdependence of nations as the information revolution, world trade, and environmental issues have made the world small and interconnected. Globalization’s impact has created a world in which what happens in one place will often make itself felt in many other places. The fight for increasingly scarce resources such as oil, water, and food will continue to be the cause for many conflicts, and air mobility will almost always called upon. USAF Chief of Staff General Ronald R. Fogleman’s statement in the early 1990s that "Air mobility is a part of every ongoing military operation today" illustrates this.

5. Operations other than war (OOTW). Most conflicts, except the two Major Theater Wars (MTW)s that we currently plan for, fall into this category. These include peace operations (peace keeping, peace making, peace enforcement), humanitarian assistance, nation building, disaster relief, and other small scale skirmishes for militaries not engaged in direct threats to their nations’ security. These require many troops, equipment, and supplies, and often a nearly insatiable demand for airlift for at least for the first 30-60 days of deployment and

continuously thereafter for sustainment and redeployment. The traditional "combat" aircraft are of limited utility in OOTW operations. The recently completed Quadrennial Defense Review highlighted the importance of OOTW in the future strategy of global engagement and enlargement.

6. Conventional forces vs nuclear forces. Although weapons of mass destruction continue to flood the world's arms bazaars, the use of them by a sovereign state appears unlikely, due in part to a still fairly sizable SIOP (Single Integrated Operation Plan). However, as Margaret Thatcher stated on nuclear weapons, "We have now made the world safe for conventional war." Therefore, conventional forces are now more of a deterrent to war than nuclear weapons. But without this ability to rapidly project military force when and where needed, these conventional forces are nearly useless. Retired US Army Colonel Harry Summers described this state of affairs back in 1991 when he said:

> In the post-Cold War, postnuclear world, the real strategic military headquarters is not the Strategic Air Command at Offutt AFB in Nebraska, but the United States Transportation Command at Scott AFB in Illinois.

Recent examples of rapid global mobility's sudden rise to the forefront of national military strategy included DESERT SHIELD/STORM (power projection, conventional deterrence, dominant maneuver, focused logistics), UPHOLD DEMOCRACY (show of force, precision engagement, focused logistics), VIGILANT WARRIOR (deterrence, dominant maneuver), DESERT STRIKE (global attack, precision engagement). So while the importance of strategic mobility has evolved based on this changing international security environment, so too have the tools and capabilities of rapid mobility kept pace.

But is this ascendancy of rapid global mobility a revolution in military affairs? Yes, because of tremendous improvements in technology, the introduction of new operational concepts, and the implementation of new organization concepts. This revolution in military affairs as it affects rapid global mobility is so profound and yet so subtle that such impact has nearly gone unrecognized.

Revolution in Military Affairs (RMA) Defined

According to the Winter 1995-96 issue of Joint Force Quarterly, "Most senior military and civilian leaders agree that the specific technologies are those that allow us to gather, process, and fuse information on a large geographical area in real time, all the time; that allow us to transfer that information--call it knowledge--to our forces with accuracy and speed; and that provide us the capacity to use force with speed, accuracy, precision, and great effect over long distances."[4]

This is a view shared by many other military scholars, including Dr. Eliot Cohen, a professor at John Hopkins University, who wrote in the Mar/Apr 96 issue of Foreign Affairs: "A revolution in military affairs is under way. It will require changes of a magnitude that military people still do not completely grasp and political leaders do not fully imagine."[5]

Normally, these views have perhaps concentrated too much on technology and not given enough attention to the other two components of RMA--operational and organizational changes. One of the biggest lessons of military history is that technology must be used properly to enhance a military's capabilities, that this often takes time to learn, and unfortunately much blood is spilled in the process.[6]

An excellent example of this "bloody learning curve" is the American Civil War which used weapons mass produced by the industrial revolution, slaughtering courageous troops using Napoleonic tactics of massed frontal assaults, and World War I where the technology of defense was stronger than the offense, producing similar catastrophic results.

Therefore, it is crucial that the entire revolution in rapid global mobility be viewed not simply from the perspective of technological advance, but also through the lens of operational and organizational change. Only doing this will one grasp the full effect of the RMA and avoid those horrific consequences.

We must also remember that the tenants of warfare as espoused by the timeless military theorists Sun Tzu, Jomini, Clausewitz, and others will not change. In other words, new technologies change only war's form, not its nature.[7]

Having a better understanding of the importance of the RMA, a more complete review of rapid global mobility as an RMA can be accomplished.

Operational Concepts

Operational concepts are the ways new technologies are applied. Writing doctrine is one of the clearest methods to espouse the use of technologies, and both the USAF at large, and Air Mobility Command in particular, are doing just this. In forging the AF Doctrine Center at Maxwell AFB, the USAF is providing a central point to tell the airpower story in both joint and service publications. In allowing HQ AMC/XPD to focus soley on doctrine, AMC is hoping to create detailed, up to date, and extensive doctrine on the proper uses of airlift and air refueling and their role in rapid global mobility. Currently, there is little writing about the use of any mobility, much less air mobility, except in a handful of books such as Over The Hump, written by the father of air mobility Lt Gen Tunner, and So Many, So Much, So Far, So Fast written by Dr. James Matthews and Cora J. Holt, the definitive summary of the Gulf War strategic lift. The current joint doctrine concerning mobility is perhaps misplaced as a logistics concept. As illustrated by the changing international environment, mobility operations will be the key to protecting US interests abroad.

The key premise of the evolving operational concept associated with the proper exploitation of rapid global mobility is CONUS based, global power projection of massive and overwhelming force anywhere, anytime, when needed. Some of these maturing operational concepts that enables the strategic ability of those forces include Global Reach Laydown, Air Mobility Express, In-transit visibility, direct delivery, free flight, and focused logistics.

AMC's en route infrastructure is one of the most critical aspects of rapid global mobility but one of the least appreciated, until recently. In late 1996, General Walter Kross, Commander AMC, and USCINCTRANS, designated 1997 as "The Year of the En Route." Reduced from 37 locations to just 13 in 5 years, only now are we appreciating the effects a viable and flexible en route infrastructure has on throughput to the warfighter. As the Gulf War proved again, rapid global mobility requires a series of strategically located and well maintained "way stations" for refueling, rotating crews, maintenance, and command and control to sustain a large scale power projection mission. Since it is not cost effective to maintain a pre-Cold War number of major en route bases, the concept of Global Reach Laydown (GRL) was devised. This involves converting a bare base--sometimes with only a runway and potable water--into a fully functioning base for air mobility aircraft. The value of GRL has been proved in the recent relief efforts in Central Africa.

Another new operational concept is Air Mobility Express (AMX). This involves a commercial express air terminal contract designed to cut processing time to get war-stopper cargo to the AOR on AMC or commercial aircraft in less than 72 hours during a contingency or exercise.[8] AMC plans to have this under contract during FY97. While AMX will be used during wartime, World Wide Express (WWX), a commercial contract, will provide international express delivery program for packages and cargo during peacetime.

In-transit visibility improvements are allowing the warfighters the ability to track cargo anywhere in the Defense Transportation System (DTS), but this is still maturing. The Global Transportation Network (GTN) is the DoD system for ITV along with being USTRANSCOM's command and control system. Knowing where cargo and passengers are will allow USTRANSCOM to better utilize assets, reduce the amount of reordering and inventory levels by the users, conduct fluid movement of troops into the theater, and react much faster to meet the commander's rapidly changing needs.[9]

Profound changes in the air traffic control environment worldwide will allow mobility forces to move even more rapidly--as long as they are properly equipped to do so. The eventual goal of the International Civil Aviation Organization (ICAO) changes is free flight--the fastest path for aircraft to move between destinations. In order to permit aircraft to operate off pre-existing route structures, all aircraft must be specially modified.[10]

Major components include communication (datalink), navigation (GPS), surveillance (TCAS), and air traffic management (RVSM). But these equipment requirements will be costly--$2.5 billion dollars for AMC alone--and require years of modifications. If AMC does not meet these requirements, its 1700 aircraft will be denied airspace, which will lead to increased fuel consumption, non-optimum routes (longer time to destination), ATC delays, restricted throughput, and delayed MTW closure.[11]

One final air mobility operational concept that is revolutionizing the way in which RGM is utilized is direct delivery. Direct delivery can be depicted this way: instead of a strategic airlifter flying from the CONUS to an overseas location, then transloading its cargo to a theater aircraft (C-130 or helicopter) which then flies to the final destination in theater, the C-17 eliminates the middle step by flying directly from the CONUS to the theater location. Such a concept not only

saves times and money, but also bypasses critical "chokepoints" that may be more inaccessible in the years ahead. Direct delivery is a force multiplier providing "door-to-door" delivery of combat forces, equipment, and supplies.

Organizational Adaptation

Most of the history of US defense transportation has been marked by disunity of effort. Only since 1987 with the creation of US Transportation Command (USTRANSCOM) has this situation been rectified. USTRANSCOM is the single manager for air, land, and sea transportation for the DoD, both in time of peace and time of war. It determines the best mode of transportation a request should be levied against, tasks the appropriated Transportation Component Command (TCC), and monitors the mission until completion.

As one examines the organizational adaptation of rapid global mobility in the realm of the revolution in military affairs, it becomes apparent that a "system of systems" characterizes this enormous operation. The all encompassing system is the Defense Transportation System (DTS) managed by USTRANSCOM. The single entry point into the DTS for the customer is the Joint Mobility Control Group (JMCG). Requirements flow to the Mobility Control Center (MCC)--the nerve center of the JMCG--then to the TCCs for planning, scheduling, execution, and monitoring.[12]

Once the JMCG determines that a requirement needs to go by air, it tasks the Tanker Airlift Control Center (TACC) at HQ AMC to fulfill the requirement. The TACC is AMC's primary command and control agency. Like the JMCG, it operates on the principle of centralized control and decentralized execution, and is structured to provide the AMC Commander with the flexibility to quickly respond to time-sensitive missions. All AMC CONUS-based air assets, except a few Special Air Missions (SAMs) are managed this way.

Several other air mobility organizations provide direction to air mobility assets en route. The Air Mobility Operations Group (AMOG) coordinates the deployment of resources from its in-garrison units, with possible augmentation from other active duty or Air Reserve Component (ARC) units. The TACC tasks the AMOGs to provide C2, aerial port, logistics, combat camera, C4I, civil engineering, security, weather, intelligence, and other assets needed to meet mission support requirements. The AMOGs are the heart of the Global Reach Laydown (GRL) concept and are key to expanding the fixed en route system.[13]

The TACC, in conjunction with the AMC staff and mobility units, tailors the AMOGs, one at Travis AFB and the other at McGuire AFB--to provide GRL packages according to the requirements of each specific en route location. The AMOG and GRL CONOPs have been fine-tuned so well that an AMOG can establish an optimized en route structure within the first 3 to 5 days of a contingency.[14] This even to the remotest parts of the world, as the recent humanitarian operations in central Africa illustrated.

But while the establishment of USTRANSCOM, the JMCG, AMC/TACC, AMOGs, and other organizational structures have drastically improved the responsiveness of global mobility, one recent change has added as much to this organizational effectiveness--the transfer of all CONUS

based C-130s back into AMC along with all CONUS based Air Force Operational Support Assets (OSA) assets.

A seamless airlift system also involves no disruption in efficiency between the strategic, operational, and tactical levels of warfare. Thus, having a common standard of training, equipping, tactics, doctrine, support, and command enable a smoother interoperability of all air mobility forces, worldwide. This smooth transition will allow faster and more effective delivery of passengers, equipment, and supplies. Other benefits of AMC's ADCON of CONUS C-130s include common requirements determination, centralized programming, acquisition and budgeting, common manning, training, evaluation and inspection standards, seamless logistics, seamless contingency planning, and seamless contingency execution. This "lead command" approach is needed because of the quick response and high visibility required to operate in today's environment, the frequency and simultaneous occurrence of contingencies, and the high cost of inefficient use of mobility assets.[15]

All these organizational changes above have been implemented against the background of extensive downsizing, reengineering, streamlining, outsourcing and privatization, and continued downward pressure on the defense budget. In addition, an extensive study by USTRANSCOM and its three components--Air Mobility Command (AMC), Military Sealift Command (MSC), and Military Traffic Management Command (MTMC)-- of the best business practices of industry and subsequent development of performance-based metrics all promise even greater improvements in the ability of mobility assets to deliver the goods anywhere, anytime, faster than any enemy can imagine.

Technology

This third component of the revolution in military affairs, technology, is being discussed last to make this point: that since DESERT STORM, the preponderance of literature concerning the RMA has concentrated on technology, virtually ignoring the equally important aspects of operational and organizational concepts and adaptations. This mistake has been made throughout history. Maj Gen Robert Scales, author of the official Army history of the Gulf War, warns that all the money being spent on high technology will be ill-spent if all it does is "perfect war as we know it today."[16]

One of the few constants of war has been that technology changes war's form, not its nature. General Gordon Sullivan, former Army Chief of Staff, outlined four constants that will remain with us even in future conflicts: the roots of war, the nature of war, demands of both science and art from military leaders, and the essence of fighting power.[17] Improvements in technology should drive changes in tactics, organization, doctrine, equipment, force mix, and methods of command if it is to have a significant benefit. In other words, technology by itself, in a vacuum, will produce marginal benefit or be harmful if not used correctly. Determining the proper use of a technological improvement takes in-depth study, research, "battle labs," and debate. But most of all it requires "out of the box" thinking, asking a lot of "what ifs", and the ability and the courage to be able to disregard outmoded ways of doing business. As the military theorist Liddell-Hart stated: "The hardest thing in the military is not to get a new idea in, but to get the old idea out."

So too is it that high tech changes are sweeping rapid global mobility. Four categories of technological advancements have profoundly impact RGM. These include information systems, Global Air Traffic Management (GATM), aerospace engineering, and infrastructure advancements.

There has been no shortage of literature about the impact of the information revolution on military affairs, in fact upon society itself. Initial indications clearly show that information is power, that information systems can make transportation operations faster, more efficient, and more visible, and that the side with the information advantage can win with minimum casualties in minimum time. Dr. Eliot Cohen, author of the Gulf War Airpower Survey and articles in Foreign Affairs, recently said that information technologies have indeed created an emerging revolution in military affairs, whose final course no one can predict.[18]

Rapid global mobility is capitalizing on this information revolution with a number of programs and systems. The Global Transportation Network (GTN) will provide decision support tools enhancing capability to manage the command's global transportation operations.[19] GTN will consist of four major parts: In-transit visibility (ITV), current operations, future operations, and patient ITV, each added incrementally. Although scheduled for full operational capability in Jan 99, portions of the system are already operational with over 1,000 users worldwide through the Web interface. This system will be the nervous system for the DTS, allowing instant access to millions of pieces of information.

The TACC uses the Global Decision Support System (GDSS) to centrally control air mobility assets worldwide. GDSS provides TACC leaders with the global C2 situational awareness needed to initiate, redirect, and support mobility missions anywhere. The Command and Control Information Processing System (C2IPS) is the wing level interface for monitoring mission execution. Aircraft crews receive mission planning data through mission itineraries in C2IPS. Wing and en route controllers input key event completion times into C2IPS. Through this medium, data is collected and communicated to the decision makers at all echelons of command, allowing for the efficient and effective allocation of scarce mobility assets.[20]

While USTRANSCOM and its components continue investing in information systems, work is being done to avoid duplication of effort, to use commercial off-the-shelf technology, and to constantly seek the feedback of customers. For example, USTC is consolidating 149 legacy systems into just 23 while executing its daily operations.

Just as information systems will have a profound effect on the command and control of air mobility assets, so too will it have an effect on the operations of those platforms. Global Air Traffic Management is quickly ushering in a revolution in domestic and international airspace. In order for the finite airspace to accommodate the increasing volume of air passenger and cargo movement, the FAA and ICAO are revamping the world's airways, enabling the concept of "free flight." Beginning in Mar 97 and continuing incrementally for the next decade, these changes are forcing AMC's 1700 aircraft to undergo radical (and very expensive) modifications. There is no alternative, because failure to comply with these emerging requirements will restrict AMC aircraft from optimum airspace, thus significantly crippling AMC's ability to support the warfighting CINCs.

There are four portions of GATM: communications, navigation, surveillance, and air traffic management. The communications requirement is datalink which is used to request and approve non-voice clearance requests and ATC instructions, gather weather information, and furnish automated position reports. GATM navigation requires GPS for flight in all oceanic airspace by CY05. Surveillance furnishes and receives non-voice aircraft position and intent data. Mode-S transponder and Traffic Collision Avoidance System (TCAS II) are all required. Air traffic management mandates Reduced Vertical Separation minimum (RVSM)--only 1,000 feet of vertical separation between aircraft vice 2,000 beginning on 27 Mar 97.[21]

AMC's compliance with GATM requirements will allow its aircraft not only unrestricted use of optimal airspace, but use of "free flight" or the most direct air routes between destinations without taking time-consuming and fuel consuming deviations, thereby speeding rapid global mobility even more.

Advancements in aerodynamics, propulsion, and system integration has provided the USAF with the world's most capable airlifter--the C-17. It proved in Operation JOINT ENDEAVOR that it could fly outsize cargo in a medium threat environment into short austere airfields (SAAF). Although still maturing due to limited numbers, the C-17 is proving to be worth its weight in gold. Its computerized systems allow for ease of handling and a reliability rate of over 90%, even during contingencies. This aircraft will surely be the mainstay of strategic airlift for at least a generation if not longer.

The C-17's ability to combine the strategic range and cargo carrying capability of C-141s and C-5s with the tactical abilities of the venerable C-130 allow it to deliver any piece of Army combat equipment including MA2A tanks and Patriot missile batteries directly from the CONUS to the combat zone, eliminating one step in transloading payloads. This capability enables the Joint Vision 2010 tenet of dominant maneuver, thus saving time but more importantly lives.

But capable aircraft, aircrews, and C2 systems are just a portion of the air mobility system a robust and flexible infrastructure requires to ensure maximum effectiveness. Air Mobility Contingency Precision Approach Capability (AMCPAC) is a quick response, rapidly deployable contingency precision approach capability. This will provide a precision approach ability with growth for a near-zero/zero capability (zero ceiling and zero visibility), allowing access to airfields regardless of weather.[22] This need was identified most recently during operation JOINT ENDEAVOR.

Mobile C2 systems with instant satellite communications will allow instantaneous access between the JMCG/TACC and TALCEs worldwide, allowing for even greater efficiencies in utilizing scarce transportation resources.

The Synergy of Rapid Global Mobility

Great advancements in operational concepts, organizational adaptations, and technology have made rapid global mobility an important element of our National Military Strategy (NMS). Mobility assets cannot be seen as supporting, or second tier, forces. Recent deliberations during the QDR reaffirmed their importance to successfully achieving future US strategy.

With AMC now lead command for air mobility in the USAF, and USTRANSCOM responsible for defense transportation in peace and war, there is now a construct of air mobility as a global system--factory or fort to fox hole. Never before in warfare has this been accomplished

Rapid global mobility is not only a true force multiplier, but it is often the "force of choice" for continued US engagement in a world still undergoing tidal changes from the fall of communism. In the post-Cold War era, rapid global mobility is now the first weapon of choice in peace and in war. As a member of the joint team, to deter war initially; but failing that, to defeat our enemies and protect US interests.

Endnotes

1. Colonel Dennis M. Drew, USAF (Retired), "With Fogleman in power, will airlift be elevated?" Air Force Times, 24 October 1994: 70.

2. Global Engagement: A Vision for the 21st Century Air Force. HQ USAF, Washington, DC, 1996, p. 1.

3. Joint Vision 2010 Summary, point paper, Maj Favorite, HQ AMC/SCPSC, 12 Jul 96

4. William A. Owens, "The American Revolution In Military Affairs," JFQ, Winter 1995-96, p. 37.

5. "A Revolution in Warfare," Eliot A. Cohen, Foreign Affairs, Volume 75 No. 2, Mar/April 96, p. 54.

6. Fred Hugh, "The Effects of Technological Innovation on Strategy," Soldier-Scholar, Summer 1996, 18.

7. Antonio J. Echevarria II, "The Legacy of Clausewitz," JFQ, Winter 1995-96, 78.

8. "Air Mobility Express," point paper, Mar 97, HQ AMC, Scott AFB IL.

9. "ITV: Importance From a Business Perspective." point paper, Mar 97, HQ AMC, Scott AFB IL.

10. Air Mobility Master Plan (AMMP) 97, HQ AMC/XPDL, 1 Oct 97, Scott AFB IL, 2-12.

11. "GATM," point paper, HQ AMC, Mar 97, Scott AFB IL.

12. "JMCG: Hub of the Defense Transportation System," point paper, Mar 97, HQ AMC, Scott AFB IL.

13. AMMP 97, p. 2-8.

14. AMMP 97, p. 2-8.

15. "Creating Seamless Air Mobility System," HQ AMC White Paper, Scott AFB IL.

16. "Cybersoldiers test weapons of high-tech war," Steven Komarow, USA Today, p 16.

17 "The effects of Technological Innovation on Strategy," Fred Huh, Soldier-Scholar, Summer 1996, p. 21.

18. Eliot Cohen, "A Revolution in Warfare," Foreign Affairs, 1996, p 37.

19. "Global Transportation Network (GTN)," point paper, Mar 97, USTRANSCOM, SCOTT AFB IL.

20. AMMP 97, p. 2-10.

21. "GATM," point paper, HQ AMC, Mar 97.

22. "AMCPAC," point paper, Mar 97, HQ AMC/XPRN, Scott AFB IL.