AU/AWC/RWP-102/97-04

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LOGISTICS REFORM AND THE MILITARY STRATEGY OF THE UNITED STATES: WILL THE REVOLUTION IN DEFENSE LOGISTICS SUPPORT THE REVOLUTION IN MILITARY AFFAIRS OR IS IT A COST-SAVINGS PROGRAM THAT MAY WEAKEN OUR STRATEGY?

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Curriculum Requirements

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April 1997

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

Public reporting burder for this collection of information is estibated 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 this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burder to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 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 any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (FROM - TO)
01-04-1997	Thesis	xx-xx-1997 to xx-xx-1997

4. TITLE AND SUBTITLE
Logistics Reform and the Military Strategy of the United States: Will the Revolution in Defense Logistics Support the Revolution in Military Affairs or is it a Cost-Savings Program that may Weaken our Strategy?
Unclassified

5a. CONTRACT NUMBER
5b. GRANT NUMBER
5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Kane, Robert C. ;

5d. PROJECT NUMBER
5e. TASK NUMBER
5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME AND ADDRESS
Air War College
Maxwell AFB, AL36112

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS
,

10. SPONSOR/MONITOR'S ACRONYM(S)
11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
APUBLIC RELEASE
,

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Over the past several years several major issues, two of which are the premise that a Revolution in Military Affairs (RMA) is underway and that the national defense share of federal resources should be reduced, have led DOD to undertake what has been termed a ?Revolution in Defense Logistics.? This revolution is intended to develop a more efficient and effective ?vision for the logistics concepts that will support the style of warfare the RMA envisions in our future.? The purpose of this paper is to review DOD?s plan and its progress by analyzing the fundamental changes identified in a speech by the Undersecretary of Defense for Acquisition and Technology. The central thesis in exploring this topic is to assess whether these ?revolutionary changes? represent a true revolution in the military effectiveness and strategic thinking of RMA-style warfare of the future or primarily a way to improve the cost-efficiency of U.S. armed forces in order to free up funding for other purposes. The study was conducted primarily by review of operational and logistics doctrine, lessons learned from recent contingencies and current writings on logistics support to warfighting forces of the future. As a result of this study, while these changes are touted as revolutionary thinking, overall it appears most of the initiatives actually represent evolutionary changes which primarily affect cost-efficiency rather than true RMA-type changes in logistics thinking.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE	Public Release	46	Fenster, Lynn lfenster@dtic.mil
Unclassified	Unclassified	Unclassified			19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007

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Preface

As a result of having spent the better part of the past eight years focused on logistics planning in Turkey and on the United States Transportation Command staff, I have come to better appreciate the role and overwhelming value of logistics in warfighting. At the current time, with RMA, defense cuts, and efforts to achieve new efficiencies and effectiveness through changes in our transportation and logistics infrastructure in the professional literature everyday, I found this to be an effective way to study and integrate much of the current thinking on these very important issues. If Martin Van Creveld is correct in stating, "Logistics make up as much as nine tenths of the business of War," then it behooves everyone in the defense community to place more emphasis on studying the impact logistics will have on the conduct of warfare as it is being envisioned for the future.

I would also like to acknowledge the time and effort of Dr. David Blair, my Air War College faculty advisor, in assisting with this research. His thoughts and guidance on the subject of RMA and strategic thinking was invaluable in my coming to some better understanding of the many of possibilities, as well as the many misconceptions, surrounding the current debate over whether a RMA is actually underway and what it may mean for the future of warfighting.

AU/AWC/RWP-102/97-04

Abstract

Over the past several years several major issues, two of which are the premise that a Revolution in Military Affairs (RMA) is underway and that the national defense share of federal resources should be reduced, have led DOD to undertake what has been termed a "Revolution in Defense Logistics." This revolution is intended to develop a more efficient and effective "vision for the logistics concepts that will support the style of warfare the RMA envisions in our future."

The purpose of this paper is to review DOD's plan and its progress by analyzing the fundamental changes identified in a speech by the Undersecretary of Defense for Acquisition and Technology. The central thesis in exploring this topic is to assess whether these "revolutionary changes" represent a true revolution in the military effectiveness and strategic thinking of RMA-style warfare of the future or primarily a way to improve the cost-efficiency of U.S. armed forces in order to free up funding for other purposes.

The study was conducted primarily by review of operational and logistics doctrine, lessons learned from recent contingencies and current writings on logistics support to warfighting forces of the future. As a result of this study, while these changes are touted as revolutionary thinking, overall it appears most of the initiatives actually represent evolutionary changes which primarily affect cost-efficiency rather than true RMA-type changes in logistics thinking.

Chapter 1

Introduction

Logistics make up as much as nine tenths of the business of War.

—Martin Van Creveld

There is a growing consensus within the defense community that a revolution in military affairs (RMA) is underway. According to Andrew Marshall, director of the Office of Net Assessments in the Office of the Secretary of Defense, "a RMA is a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organizational concepts, fundamentally alters the character and conduct of military operations.[1]

There is also a growing national desire to balance the budget in the Post-Cold War era, while funding ever-growing entitlements, which will put increased downward pressure on national defense resources. Corresponding to, and partly driven by, this decrease in defense-related resources are major changes ongoing throughout the military-industrial complex which in the future could significantly alter the traditional image of the American economy as the "arsenal of Democracy" and the way we support our fielded forces.

In addition, Joint Vision 2010 reiterates that "power projection, enabled by overseas presence, will likely remain the fundamental strategic concept of our future force."[2] Similar service-unique documents also acknowledge how important our ability to efficiently and effectively project and sustain effective combat power will be in the future.

The combination of these powerful trends has created a situation where the Department of Defense (DOD) must **again** consider developing a more efficient and effective "vision for the logistics concepts that will support the style of warfare the RMA envisions in our future."[3]

With this in mind, this paper will review DOD's plan, analyze the fundamental changes identified as necessary for this "Revolution in Defense Logistics" to take place, and assess whether these "revolutionary changes" will significantly contribute to the military effectiveness of future RMA-style warfare or primarily improve the cost-efficiency of U.S. armed forces.[4] As a central thesis in exploring these topics, we will see that while overall these changes are touted as revolutionary, most of the initiatives actually represent evolutionary changes which primarily affect cost-efficiency.

For the purposes of this paper it is not necessary to state unequivocally that a RMA is underway, and this will not be argued, only to assume major changes in battlefield awareness, precision weapons, and other tenets of a RMA are present and will drive the need for more focused, efficient, and effective logistics doctrine, organization, and systems to be fielded in the future. Therefore, this paper will only discuss the issues listed as necessary for a successful RMA, or revolution in defense logistics, as found in the definition above: exploitation of technology, doctrine, and organizational changes.

This paper also assumes there is a very real threat to U.S. ability to "easily project power."[5] Various threats to our power projection capability, especially our logistics infrastructure systems, from "cheap, stealthy cruise missiles"[6] and weapons of mass destruction[7] have been highlighted and represent serious issues for future logisticians and warfighters. It appears that at least several militaries have learned some serious lessons from our conduct of the Gulf War.[8,9] Therefore, from both the logistics and operations standpoints, we must adapt and ensure we are not preparing to fight the last war again.

Notes

[1] Barry R. Schneider and Lawrence E. Ginter, *Battlefield of the Future 21st Century Warfare Issues* (Air University Press, Maxwell AFB, AL, September 1995), 65.

[2] Office of the Chairman Joint Chiefs of Staff, *Joint Vision 2010* (Washington DC, 1996), 4.

[3] Paul G. Kaminski, "The Revolution in Defense Logistics," *Defense Issues* 10, no. 107 (October 1995), 1.

[4] Ibid., 1.

[5] David Blair, "How to Defeat the United States: The Operational Military Effects of the Proliferation of Weapons of Precise Destruction," in Henry Sokolski, ed., *Fighting Proliferation: Lessons for the 1990s* (Air University Press, Maxwell AFB, AL, 1996), 75.

[6] Jeffery R. Bartnett, *Future War: An Assessment of Aerospace Campaigns in 2010*, (Air University Press, Maxwell AFB, AL, 1996), xxiv-xxv.

[7] Colonel Randall J. Larsen and Robert P. Kadlec, M.D., *Biological Warfare: A Post Cold War Threat to America's Strategic Mobility Forces* (University of Pittsburgh Graduate School of Public and International Affairs, University Center for International Studies, 1995).

[8] Brigadier VK Nair, *War in the Gulf: Lessons for the Third World* (Lancer International, New Delhi, 1991), 182-197.

[9] Benjamin S. Lambeth, *Desert Storm and Its Meaning: A View from Moscow* (RAND, Santa Monica, CA, 1992), 70.

Chapter 2

Background

Clearly, this is not the first time logisticians and political leaders have attempted to put more "discipline" into the logistics process. In fact, during the late 1940's and early 50's, concepts were developed by the Air Material Command to deal with the exact issues being raised today.

> The advent of jet aircraft made the disparity between supply and striking speed even more acutely frustrating. Moreover, the long pipeline time meant that more items had to be purchased to fill it, consuming budget dollars that were needed for other purposes. The Air Materiel Command *elected to attack this sluggishness with the weapons of airlift in combination with automation in its various forms—electronic data processing, communications, inventory control, material handling, and manufacturing methods.* (emphasis added)[1]

In addition, in 1953 the Chief of Staff of the Air Force endorsed a concept known as "Logistics for 1956" which was supposed to lay out the policies and actions necessary to improve logistics performance.

> This package of ideas called for ending the practice of prestocking supplies overseas, reducing the work load at overseas depots, and reducing the amount of materiel which was in the supply pipeline at any given time. The objective was to place as much of the peacetime stocks as possible in the hands of the operational commands, with the remainder located where they could be made available promptly.[2]

Apparently the good ideas of the 1950's, which due to technological limitations were never effectively implemented, now portend to be the revolutionary ideas of the 1990's.

Interestingly, these concepts sound very much like those outlined in DOD's Logistics Strategic Plan and the Air Force's concept of "Lean Logistics" and very much represent an attempt to capture the efficiencies inherent in the commercial business practices of just-in-time logistics.[3]

Another factor which must not be overlooked, and which should always be given primary consideration by the warfighter in this drive to "reengineer" our logistics processes, is the effect on operational performance. The best and most current example of how important it is to properly link operations and logistics performance is Desert Shield/Desert Storm (DS/DS). Clearly, the Gulf War was a great success from both the logistical and operational perspectives—in that we successfully supplied the shooters with what was needed to win the day with few casualties. And, in terms of magnitude, the movement of equipment, people, and supplies was truly historic.

> In contemporary terms, the command moved to the Persian Gulf area, via air and sea, the rough equivalent of Atlanta, Georgia—all its people and their clothing, food, cars, and other belongings—half way around the world in just under seven months. General Schwarzkopf called the task "daunting" and the result "spectacular." Secretary of Defense Richard B. "Dick" Cheney termed the deployment "a logistical marvel," while the Chairman, Joint Chiefs of Staff, Army General Colin L. Powell, told Congress it had proven USTRANSCOM's worth.[4]

Bottom Line: USTRANSCOM and its components, along with the commercial transportation sector, managed to move what was ordered. Unfortunately, it now appears that one of the things this historic deployment may be noted for is how much we moved to the desert unnecessarily due to a lack of asset visibility over what was being moved.

> This shortcoming was clearly demonstrated during Desert Storm, when *half* of the 40,000 bulk containers shipped into the theater had to be opened in order to identify their contents. We sent *twice* as much materiel to the Persian Gulf as we needed, we didn't know where *half* of it was at

> any given moment in time, and *most of it failed to contribute in any way to our success on the battlefield.* (emphasis added)[5]

The challenge for DOD becomes fairly clear when budgetary and operational factors are considered, and is expressed very well in the DOD Strategic Logistics Plan vision. The DOD Logistics System will: Provide reliable, flexible, cost-effective and prompt logistics support, information, and services to the warfighters…; and achieve a lean infrastructure. Unfortunately, as mentioned earlier, much of this is familiar territory which we have tried and failed to implement before.[6]

This statement raises an interesting chicken-or-the-egg question which cannot be overlooked and whose answer must be carefully weighed and understood by all members of the defense community—we must understand whether the revolution in defense logistics represents evolutionary changes which primarily improve efficiency and save money to be used for modernization, etc., or does it represent revolutionary change which in fact strategically changes warfighting and contributes to the current RMA. Following a quick review of the DOD's plan, each fundamental change will be analyzed for clues as to which way the program appears to lean.

Notes

[1] Lt Col David C. Rutenberg and Jane S. Allen, *The Logistics of Waging War—American Logistics 1774-1985 Emphasizing the Development of Air Power* (Air Force Logistics Management Center, Gunter AFS, Alabama, 1983), 138.

[2] Ibid., 138.

[3] Office of the Deputy Under Secretary of Defense (Logistics*), Department of Defense Logistics Strategic Plan 1995 Edition*, (Washington DC, 1995).

[4] James K. Matthews and Cora J. Holt, *So Many, So Much, So Far, So Fast: United States Transportation Command and Strategic Deployment for Operation Desert Shield/Desert Storm* (Joint History Office, Office of the Chairman of the Joint Chiefs of Staff and Research Center United States Transportation Command, 1996), 12.

[5] Ibid., Kaminski, 5.

[6] Ibid., DOD Logistics Strategic Plan, 4.

Chapter 3

The DOD Plan

The logistics community's plan to reach this vision was outlined in four fundamental changes by the Undersecretary of Defense for Acquisition and Technology in an October 1995 speech.

> First, there is no question in my mind that there are many more areas where private sector logistics support can be substituted for DOD organic capabilities with greater effectiveness, at less cost, and with no added risk.
>
> Second, the department needs to move more aggressively to substitute the ability to rapidly transport material for our very costly practice of maintaining layers of redundant materiel stocked around the country and the world just-in-case we need it at some specific locale quickly.
>
> Third, and probably most importantly, we must substitute valid real-time information regarding the complete status of all our resources—personnel, weapons, equipment, supplies and so forth—for our current practice of maintaining redundant capabilities. Here I am talking about getting on with the business of deploying a true total asset visibility program.
>
> And finally, our logistics information systems must be modernized to allow the revolution to take place. A flexible and modernized information infrastructure can be the catalyst for the fundamental changes required to evolve from the just-in-case to the just-in-time environment.[1]

The Air Force, Army, and Navy appear to be fully supportive of DOD's future logistics vision. For example, the Air Force is executing its responsibilities in this area through Lean Logistics. Lean Logistics, now in its infant stage, is an operating concept whose principles include reducing the cycle times of all segments of the logistics system,

exploiting the potential of advanced management information systems for visibility over the entire system, express delivery of critical parts through the supply and transportation systems, and reducing the "mobility footprint" (the volume of people and equipment required to support deployed operations).[2]

The Army has thoroughly revised its logistics doctrine (strategic through tactical levels) in U.S. Army Field Manual 100-5, Operations, Chapter 12: Logistics. It lays out a vision of what must be achieved and accomplished in the immediate future and beyond to successfully build and sustain the force-projection Army in an RMA-driven, information intensive combat environment.[3]

And finally, the Navy and Marines are exploring future warfighting constructs such as Sea Dragon through their Warfighting Laboratory to determine the implications for doctrine that a RMA-style armed force will bring.[4]

The DOD plan seems sound, the major players seem to be on board, and the resources to make it happen should be available—so how is the progress and is it evolutionary and focused on cost-efficiency or revolutionary in an RMA-sense?

Notes

[1] Ibid., Kaminski, 3.

[2] Air Force White Paper, *Air Force Logistics*, April 1996, 3.

[3] Colonel Michael S. Williams and LTC Herman T. Palmer, "Logistics," *Military Review*, June 1994, 29.

[4] General Charles C. Krulak, "Innovation, the Warfighting Laboratory, Sea Dragon, and the Fleet Marine," *Marine Corps Gazette*, December 1996, 12.

Chapter 4

Cost-Efficiency, RMA-Style Change, or Both?

In contrast to the attempts in the 1940s and 50s to develop and execute a more streamlined logistics process, we now possess the proper technological tools and incentive to make DOD's logistics vision come true. However, success is still a long way off and each of the four fundamental changes continues to present challenges for DOD and the Services. While many challenges remain, I will present one issue for each of the fundamental changes which Undersecretary Kaminski listed in the speech quoted earlier, exploring the progress toward implementation and more importantly, assessing whether the change will have cost-efficiency or strategic consequences.

"Less Cost" and "With No Added Risk"

Dr. Kaminski's first fundamental change is, "there are *many more* areas in which private sector logistics support can be substituted for DOD organic capabilities with greater effectiveness, at less cost, and with no added risk."[1] It is unlikely you could find anyone who would disagree with this premise especially if the primary focus is on the "less cost" and "with no added risk" parts of the statement. It doesn't say the whole DOD system must be turned inside out, only that we should seek out opportunities where we can exploit good ideas.

There are several concepts such as depot privatization, just-in-time delivery, and flexible, adaptive manufacturing processes being considered and in some cases actively implemented. However, from a strategic perspective it does not appear many of these will offer anything "new" or revolutionary in terms of warfighting concepts. On the surface their utility seems limited to cost-efficiency. However, the phrase "no added risk" is more complicated than it sounds. Logistics changes may well require changes in doctrine. Most importantly, we must ensure these changes improve (or, at the very least don't degrade) the survivability of our power projection forces in the RMA-style operating environment.

Many strategic (as opposed to cost) questions remain: Can we limit the risks (improve survivability)? Once we determine how far we will go toward commercial practices, how will we ensure the operating forces are comfortable and confident they will be supported in the field? Preliminary experiments show that the concepts laid out in the DOD and Air Force visions are feasible and will result in significant savings. However, I conclude in this paper that the result will be a system more dependent on adherence to doctrine, discipline, and *training the way we expect to fight* because the large excesses of the past will not be there to bail us out in a RMA-style, highly mobile, very light combat environment. It is in this area, doctrine development and adherence to it, where the changes in logistics systems will most clearly show whether we are looking at revolutionary warfighting or primarily large cost-savings.

In the past, redundancy in resources has allowed us to adapt to new circumstances. The U.S. military has had enough flexibility to ignore logistics doctrine where necessary and just make it work. The new, centrally controlled systems allow no such pad for

flexibility. In business, just-in-time inventory systems are *designed* to be so fragile that process flow or inventory control problems *must* be fixed before production can proceed. The chief purpose of these systems is to force the company to move down a learning curve. Are we inadvertently building such logistics showstoppers into our wartime planning?[2]

As mentioned before, Desert Shield/Desert Storm is only the most recent example of the U.S. logistics system relying on a massive, brute force solution to our wartime logistics needs. A recent review essay, "Gulf War Logistics," covering several accounts of the Gulf War, paints a starkly different and negative view of the world's most historic deployment as opposed to the more common unbridled praise.

While the review highlights the widely accepted problems of asset visibility and shortages of transportation, it is particularly critical of the "ad hoc manner" and lack of adherence to logistics doctrine inherent in the deployment's execution.

> Most analysts of the allied logistical effort in the Gulf War accept the basic assumption that following the established doctrine and procedures could not have produced the desired results and that it was therefore absolutely necessary to bypass the existing system with innovative ad hoc solutions to achieve the necessary levels of support for the combat units. Thus, for superficial analysts and even some senior combat arms officers, the aggressive efforts of General Pagonis and his pick-up crew were the cause of logistical success in the Gulf War. However, this popular acclamation of the innovative go-getter who overcomes all roadblocks by casting aside stuffy doctrine and inconvenient procedures is not shared by all professional logisticians.[3]

and

> Doctrine and SOPs are designed for the worst-case, long-term situation and seldom look very effective in an immediate crisis. So it was in the Gulf, and the chief logistical hero was Gus Pagonis. What General Pagonis and his coterie of protégés did to meet the many complex challenges faced by U.S. logisticians in the Gulf was to cast over 20 years of doctrinal development into the trash and invent their own ad hoc

> logistical systems almost from scratch. Undeniably, they got the job done, but the real question is whether such a jury-rigged system could have sustained a longer, more intense war. There are many indications that as the 100th hour of the war approached, serious cracks were beginning to appear, cracks that the established doctrine, despite its measured pace, was designed to avoid.[4]

The author goes on relate his discussions with experienced Army logisticians.

> …there were many faults with the logistics support in the Gulf and the sensing that, had the war continued, there was a good chance the system could have come unhinged. They were equally unanimous in condemning those who substituted their own ideas for the well-thought-out logistical doctrine that had resulted from so much toil and sweat over the previous 20 years. These officers did not confuse hyperactivity with either effectiveness or long-term efficacy.[5]

"Gulf War Logistics" concludes by indicating that while the logistical system worked extremely well for a 100-hour war which took six months to build up for, the assumption that "existing doctrine was inadequate and inflexible and that heroic measures were necessary to get the job done has been accepted uncritically by most writers of the Gulf War and has never been put to an objective examination."

In another article entitled, "Voodoo Logistics Sink Triphibious Warfare," the author makes a similar assessment from a Naval perspective. He draws strong parallels between the U.S. experience in the six-month Guadalcanal fight and the four-month Gulf War.

> Logistically, the overall picture of the Gulf War achieving spectacular success is as broad and familiar as many of the disastrous details are obscure. Iraq proved to be a weak opponent, but had it been as tenacious as our Guadalcanal opponent, would our logistics effort have been sufficient? The answer is almost certainly no. As more accurate information about the Gulf War slowly surfaces, it appears that logistically we fought this war the same way we fought Guadalcanal. If there is one concrete theme resonating from Guadalcanal and the Gulf War it is that the triphibious revolution of jointness has not gone far enough in the area of logistics.[6]

The author goes on to be critical of prewar planning, one of the areas which will be most critical to the future come-as-you-are-military envisioned for U.S. forces in the future.

> Those first U.S. triggerpullers arriving shortly after Iraq's excursion to Kuwait must have had a sick sensation that something they were experiencing had happened before. One of the most memorable low points of the Gulf War was when U.S. troops—like those first Guadalcanal Marines—were left to defend themselves without adequate supplies. As with Guadalcanal, the supply problems of the Gulf War lay rooted in prewar neglect, poor staff work, and the hasty launching of Operation Desert Shield.[7]

While one of these authors focused primarily on Desert Shield/Desert Storm from the Army logistical perspective, the second put his argument into a more joint perspective. Common to both, however, was a perception of a lack of adherence to doctrine and adequate prewar logistics planning, and a sense that deploying combat forces were vulnerable during several phases of the operation due to a lack of logistics support.

In the future, the lean logistics system will make it much more important that good fundamental logistics doctrine be developed, practiced, and, most importantly, adhered to in wartime. This would be a significant break from the past, as previously mentioned, even when the doctrine does exist, the U.S. military is prone to disregard it. In regards to logistics, the doctrine was not very well developed, and more importantly, did not appear to be given proper attention. This is probably the most important piece of the current tooth to tail debate—are we revolutionizing logistics to save money and make our military affordable or are we trying to revolutionize warfighting concepts and developing logistics concepts to maximize necessary support?

Recent doctrinal statements show that the DOD recognizes the issue. Joint Vision 2010 gives logistics a very prominent role in the overall scheme of future U.S. warfighting. Focused Logistics is named as one of four "New Operational Concepts" along with Dominant Maneuver, Precision Engagement, and Full-Dimension Protection set out as a framework for combat in future RMA-envisioned combat environments. While not yet reality, as envisioned by the Chairman,

> "Focused Logistics will be the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical levels of operations. It will be fully adaptive to the needs of our increasingly dispersed and mobile forces, providing support in hours and days versus weeks. Focused logistics will enable joint forces of the future to be mobile, versatile, and projectable from anywhere in the world."[8]

The key question is whether this vision of logistics, driven by strategy, will become reality.

Army Training and Doctrine Command (TRADOC) Pamphlet 525-5, Force XXI Operations, provides a good indication of where the Army is leaning in terms of adoption of some commercial principles, as well as the strategic implications.

> *Strategic logistics will, more than ever, represent a subset of national power because it includes the nation's industrial base and its link to military forces.* The strategic level will remain the purview of DOD, the individual services, and non-DOD governmental agencies, with an unprecedented level of support from the private sector. Reduced resources for DOD logistics and applications of electronic management and information systems will necessitate the formation of *strategic alliances between Army logistics mechanisms and civilian industry*. The civil sector will assume more responsibility for functions such as warehousing, maintenance, and material management than they have in the past. *These forged links between the sustainment base and the Army will negate the need for Army-managed stockpiles and allow a true producer-to-foxhole sustainment system*. Further, the Army will increasingly adapt, with little or no change, the successful techniques, procedures, and material

> innovations of the commercial sector to meet its logistical support requirements. (emphasis added)[9]

The key shift in strategic thinking will be the direct link between the nation's industrial capacity and the warfighter. This change in thinking about operating with limited in-theater sustainment capability will be essential if we are to ensure the survivability of our power projection forces and realize the full potential of "Dominant Maneuver" and "Precision Engagement" concepts. These concepts, especially in the early deployment phase, should reduce the need for forward logistics bases by relying on small, highly-mobile units and remote sensors to identify targets and direct long-range precision weapons from standoff platforms (e.g., cruise missiles and arsenal ships).

Similarly, the Army's 1993 version of Field Manual 100-5, "Operations," provides not just a marginal improvement in "How We Fight," but as several Army logisticians put it, "in no other area is the doctrinal evolution as dramatic as in Chapter 12: Logistics."[10]

While the document provides more insight into logistics principles at all three levels of warfare, the key change is a shift from a "forward-presence" to a true "force-projection" paradigm. The new doctrine points out operational logistics must be executed as the contingency evolves, which requires unprecedented flexibility and operations within both resource limitations and constraints imposed by mission, enemy, troops, terrain, weather, and time. The logistician simply cannot win the "information war" with outmoded, cumbersome, personnel-heavy, and batch-processing style systems.[11]

In an article entitled, "Logistics," two Army logisticians relate the key shifts in thought which must accompany this paradigm shift.

> Force projection is not "rapid reinforcement." The two are not synonymous. Rapid reinforcement was appropriate in scenarios in which

> forces were projected into theaters with at least some degree of viable logistics infrastructure and an existing force structure. Consequently, the enemy could be overwhelmed with superior logistics throughout the strategic-operational-tactical spectrum. A true force-projection Army can no longer rely on assumptions made from past models and old constructs developed in a "rapid reinforcement" environment.[12]

The following table shows the extent of doctrinal and operational changes which will be required by Army and DOD logistics planners in support of future warfighting.[13]

Table 1. Forward Deployed Army versus Force Projection Army

Forward-Deployed Army versus Force-Projection Army	
Component-tailored logistics	CINC (Joint)-tailored logistics
Theater-oriented logistics	Force-oriented logistics
Operation plan-based logistics (allocation rules)	Capability-based logistics (tailored)
Established theater logistics infrastructure	Potential for bare-base logistics operations
Forward-deployed logistics forces	Logistics deploys before or with combat forces/maritime prepositioning
Support to known coalitions	Support to ad hoc coalitions
Well-established logistics C2 and automation in-theater	Deployable logistics C2 and automation
Host nation support agreements in place	Contingency contracting/coalitions support
Threat to logistics identified	Threat to logistics less defined
Robust commo—commercially oriented	Commo austere—must be assured
Theater logistics base—risk early	Logistics buildup—higher risk
Operational/tactical logistics primarily "green suit"	Increased use of DOD/DA and private sector civilians
Well-established lines between strategic, operational, and tactical levels of logistics	Blurring and mixing of logistics levels
Logistics is a national responsibility	Multinational logistics
Requirements based (pull)	Distribution-based (push)
Service logistics systems	Joint logistics systems

The Air Force has also begun to accept the notion new logistics doctrine is extremely important to supporting the forces this RMA would field in the future. The Air Force has recently revised its core competencies to Air and Space Superiority, Global Attack, Rapid Global Mobility, Precision Engagement, Information Superiority, *and Agile Combat*

Logistics.[14] Clearly, as a core competency, logistics should begin to fare better in the battle for future resources, as well as receiving proper attention during budget, deliberate, and contingency planning.

However, the primary focus cannot remain on cost-efficiency as it presently seems to be. Air Force doctrine development must focus on ways to improve the survivability of force projection forces and shift away from the large and very vulnerable bases and infrastructure now necessary to support major force deployments. Clearly, Air Force logisticians must take the lead in highlighting the vulnerabilities and risks facing future deploying forces and their supporting infrastructures. Furthermore, just-in-time based cost-effectiveness measures may make the system so "lean" that it is unable to adjust to the unexpected.

The Navy and Marines seem most clear in their thinking about future warfighting concepts and the logistics concepts which will be necessary to support them. As previously mentioned, these innovative concepts are being explored in the Warfighting Laboratory setting as Sea Dragon.

In one Marine forum it has been postulated that due to the increased lethality and lower cost of future long-range weapons ($400,000 low observable cruise missiles), forward-based and large "foot print" early deploying forces will increasingly find themselves highly vulnerable targets. Under these conditions, rather than deterring potential aggressors, these forces could actually have the effect of eroding deterrence and then finding themselves serving as hostages to enemy long-range strike forces. Rather than reassuring allies in a region, they would become a source of anxiety further exasperating the difficulty the U.S. has in finding forward-basing and beddown locations.

Consequently, the importance of an enabling force capable of projecting power at extended ranges from the sea early in a conflict will likely increase.[15]

The Marine concept to answer this dilemma is being studied as Sea Dragon.

> Sea Dragon is a view of naval combat in which platoon-sized groups from the sea range over a battlefield, bringing down accurate fire on an enemy in unprecedented volumes. The object is to make platoons as capable as battalions once were. If we achieve this vision with sea-based fire support and ship-to-objectives logistics, we can create a genuinely different approach to warfighting. By eliminating large formations in one place to dominate the battlespace, we can fight more economically, and with fewer casualties.[16]

While this is a relatively long description, it communicates very well one possible way operations could be conducted and indicates how such operations would be logistically supported. Certainly this vision, described below, is quite different than the movement of early deploying forces in a Desert Shield/Desert Storm type environment. It appears to fulfill some of the promise of the fundamental changes in the DOD Logistics Plan.

> Operations would commence with the deployment of the long-range precision strike (LRPS) architecture and the onset of strikes designed to develop an information gap and destroy the enemy's LRPS attacks. The LRPS attacks would be conducted primarily by Navy and Air Force long-range strike elements, and perhaps Marine long-range, stealthy weaponized unmanned aerial vehicles (UAVs). The strikes would focus initially on high-value fixed-point targets, while awaiting the reconnaissance web's "thickening" to improve the prospects for successfully engaging critical mobile targets.
>
> Marine reconnaissance units would play a key role in this latter mission, along with space platforms and long-endurance stealthy UAVs launched from the Trident "stealth battleships" and arsenal ships. These combatants also would deploy remotely emplaced unattended sensors and smart mines to identify or canalize enemy movement. Marine reconnaissance teams would be infiltrated from Trident "undersea assault" boats, from longer-range, stealthy air transporters and, if the exclusion zone is not too great, perhaps from stealthy follow-ons to the V-22 Osprey operating off amphibious assault ships.

> In a conflict environment where to be identified is to run the high risk of destruction, large concentrations of forces and the "iron mountains" of supplies that accompany them will have to be avoided. *Thus the MEF in this amphibious assault battlegroup will be structured very differently from its 1996 ancestor. Marine forces will not concentrate ashore; rather, they will operate dispersed, in small units oriented on reconnaissance and targeting, as well as fire control and battle damage assessment, supporting LRPS operations while relying on dispersion and mobility to avoid contact with enemy forces. The teams will be "foot-mobile," perhaps using light vehicles that exploit improved engine performance to minimize fuel demand. Long-range stealth Osprey follow-ons also might be used to provide a measure of operational mobility*. These reconnaissance units will still be capable of aggregating into battalions and occupying territory if the situation demands (and permits).
>
> *In such an environment, logistics and fire support will have to be exported back to sea. With fewer Marines ashore, ration and munitions requirements will drop. Employing small numbers of light, fuel-efficient vehicles could reduce fuel demand dramatically*. If a Marine team is unable to avoid contact, fire support will be provided primarily from offshore platforms, long-range precision guns mounted on the arsenal ships, weaponized UAVs, and missiles, such as improved extended-range versions of the ATACMS.
>
> The Marines will rely heavily on "precision resupply" and "just-in-time-logistics." Precision airdrops by stealthy, long-range cargo aircraft will be employed, along with support from stealthy unmanned cargo aerial vehicles. Additional logistics support may come from submarines, which will draw support from mobile "floating warehouses" far out at sea. (emphasis added)[17]

Overall, it appears the uniform services are attempting to lay a foundation for the logistics concepts and doctrine necessary to support the warfighting envisioned in an RMA-style future. In time, if properly nurtured through doctrine, planning, resourcing, and training, DOD and the services will find ways to exploit private sector and other logistics concepts with *acceptable* levels of risk which will improve the cost-efficiency of the nation's military forces. As the definition of a RMA indicated, adapting doctrine is one of the elements necessary for success. It appears we are on the right path in this respect.

However, it appears what is missing is more serious consideration and development of the exotic equipment which will be needed in the future to support these "widely-dispersed, highly-mobile" units, such as stealthy, heavy-lift airships, stealthy airdrop platforms, cargo-carrying UAVs, and mobile offshore bases. For a true revolution in defense logistics to take place, we will have to look beyond trying to find cost-efficiencies in private industry. It will require developing, resourcing, and acquiring the new, technologically advanced equipment necessary for the logistical support the vision of warfighting in the future. This has the potential to be very expensive and in the past many logistics systems have not fared too well in the overall fight for resources. We must also be wary of drawing lessons blindly from private industry. The just-in-time inventory systems of private industry are not designed to react to a plant or supply line being bombed. In fact, there are many examples where lean companies were shut down because of a snow storm or supplier strike.

Substitute Rapid Transportation for Redundant Stockpile Material

The second fundamental change involves the aggressive attempt to substitute rapid, relatively cheap transportation for the very costly practice of maintaining layers of redundant stockpile material. This change can also be examined from both the cost-savings and military effectiveness perspectives. Certainly the cost of transportation has come down significantly in the past few years relative to the high cost of spare parts and other items of warfare (e.g., cheap, dumb bombs versus expensive, smart munitions). This difference should continue to grow as increasingly expensive spares for the B-2 and C-17 begin to enter the inventory and depot maintenance pipeline processes. For the

most part the nation is taking advantages of these changes in transportation technologies to lower the overall cost of doing business. DOD is no exception in this regard and is aggressively attempting to capitalize on these technologies to save money. But these are not strategic or revolutionary changes. They primarily save money from streamlined depot operations and lower inventory through logistics concepts such as Lean Logistics.

New doctrine focuses on creating a system in which deployment and sustainment activities will not be dependent on stockpiling of supplies, especially early in a conflict. Rapid movement of the equipment and supplies necessary to sustain long-range, standoff weapon operations will be the more normal mode of operations. But this is still just delivering equipment and supplies to the area of operations when the supported commander needs them. Therefore, in and of itself, this concept of relying on cheap transportation is not really revolutionary. It will be more efficient, and we hope, survivable, but this is not revolutionary. However, since transportation services are limited, they cannot be wasted. Concepts for just-in-time delivery of equipment and supplies to some form of reduced theater-level logistics infrastructure will play a major role in the success of RMA-style warfighting as currently envisioned. Therefore, our main attention must focus on ensuring our transportation capabilities are properly organized for maximum military effectiveness. This may require some rethinking of current practices and long-held beliefs about the way we control and operate our transportation systems. We also must seek to ensure that the regional CINCs have enough confidence in the system that they are will to base war plans on it.

While commercial carriers will supply the majority of airlift for making an efficient just-in-time depot maintenance pipeline system possible, the Air Force will shoulder most

of the burden in supplying the air mobility necessary to make a global just-in-time logistics system work during the early phases of a deployment. Obviously, airlift is the only transportation mode that can make a just-in-time system effective when responding to global crisis frequently measured in days rather than weeks.

In this context it is worrisome that the long-term viability of our mobility capability is in some doubt despite concerted decades-long efforts to fix the problem. Currently, air and overall strategic mobility capability, can be a limiting factor in wartime operations and in recent years the amount of required peacetime lift has been increasing for contingency and humanitarian operations as well. Humanitarian operations bring special problems to the Air Force, because they may require airlift aircraft and people to enter regions of high threat. This may limit our ability to utilize our Civil Reserve Air Fleet (CRAF) partners as occurred in Somalia. In addition, the capacity of the system planned for the next two decades is less than required to support existing forces, even with the addition of CRAF assets.[18] Clearly, DOD, through the United States Transportation Command (USTRANSCOM) and Air Mobility Command (AMC), must maximize the effectiveness of the nation's precious mobility assets.

The ability to maximize the effectiveness of the nation's transportation capability will not rely on major technological improvements in the nature or capability of lift platforms. Even though there are those advocating the development of new future mobility systems such as a global range transports and precision/large scale airdrops,[19] wing in ground effect transports,[20] and large modern airships,[21] it is likely they will prove to be neither widely available nor commercially viable in a timeframe that will significantly impact this revolution. Instead, for the foreseeable future it will likely be the

mundane business of proper organization and command and control systems which prove most effective at maximizing strategic transportation capability.

Two organizational aspects of the use of airlift, and mobility assets in general, need to be considered: the end-to-end control of the mobility system and the decision several years ago not to place C-130 assets under the control of USTRANSCOM.

First, it is essential to understand that one of the fundamental problems of DOD's transportation system is control and accountability. This does not mean the technological ability to achieve Total Asset Visibility (TAV), but rather the organizational concept of "owning the whole system." Even when the technological advances are complete, in order for effective TAV to be maintained, the users of the system must be disciplined to use it and the owners of the system must be organized to most effectively control it.

Since DOD is seeking to benefit from the best of the private sector, the model here is Federal Express. From the Federal Express driver who picks up a package to the one who delivers it, their system maintains constant control, to include personal accountability of everyone who handles it.

> If you want responsive in-transit visibility information, you place the responsibility for that system with an organization that can control its input. You don't ask for unrequited responsibility nor do you ask for cooperation, because in the stress of combat or even peacetime operation, they may both be scarce commodities.[22]

Accordingly, General William Tuttle has recommended that all DOD installation transportation assets involved in making shipments under the control of USTRANSCOM.

> The theater seaports and theater-level surface line-haul transportation would also become part of USTRANSCOM. The theater aerial ports and theater airlift squadrons would be part of AMC. Priorities for the employment of all the theater-based assets would be determined by the theater CINC. Their day-to-day operational processes, and "how we

> operate," would be the responsibility of USTRANSCOM. Therefore, the Federal Express model of system-wide organizational and personal accountability could be established by TRANSCOM. That accountability could assure the necessary discipline for an effective in-transit visibility (ITV) process in peace and war.[23]

Naturally, many will argue that this violates one of the key principles of current military organization which stresses the importance of a theater CINC owning all of the units within the theater. But, it is this type of new organizational thinking which must take place to maximize the technological advances in information processing and communications. Federal Express emphasizes that total flow control led to its success. Federal Express will not accept responsibility for a shipment without such control.[24]

One critique of FM 100-5 directly relates to this area and indicates that Army doctrine has not matured far enough in specifying the need for this type of seamless logistics system. Although the strategic, operational, and tactical levels of logistics are discussed, this critical point is missing in the doctrinal delineation of force-projection logistics. What the theater commander really requires is a truly seamless logistics system, formed by organizations and activities molded together to form a system whose three levels (national production/industry to the foxhole) are transparent to not only the CINC, but also to the ultimate consumers of logistic support. This system must be capable of supporting joint, combined, and coalition forces across the operational spectrum. Commanders and planners must be able to mix and match support structures, as required, to supplement any existing forward presence to meet the initial needs of a deploying force and remain flexible enough to provide support across the broad logistics spectrum. Current doctrine neither outlines this as a requirement nor establishes it as a desired end state.[25]

An even more radical organizational consideration, going well beyond just transportation, advocates the formation of a unified Logistics Command which would unify joint maintenance, material, and weapon system management. This is a concept very similar to USTRANSCOM and the other functional unified commands.

> These organizations were formed to command national-level military resources more efficiently and effectively than the individual services could manage them. By efficiently, I mean empowering a single commander to prioritize and allocate scarce national military resources under guidance of the National Command Authority (NCA). By effectively, I mean providing the best support to regional CINC's that capabilities will allow.
>
> Given that we live with both an uncertain strategy and a certain reduced resource environment, we must examine other scarce military assets that may call for unified reorganization at the national level. Communications, intelligence, and logistics infrastructures may fall into this category.[26]

Unfortunately, this type of organizational change will be resisted by the services very strongly.

> Historically, the services have hesitated to unify logistics, stemming from the fear of violating their organizational essence. The services have a deeply rooted propensity to retain control over organizing, training, and equipping forces. "Logistics is a service responsibility" is a doctrine long associated with that propensity.[27]

Assignment of C-130 assets, which have already been alluded to, is not dependent on whether the contentious joint/theater or joint/service level divisions of authority can be resolved. Assignment of the C-130 fleet from AMC to Air Combat Command (ACC) in 1993 was essentially an internal Air Force organize, train, and equip issue. As part of ensuring maximum overall effectiveness of ***DOD*** mobility assets, this decision was recently revisited. The result is that C-130 assets will be returned to the Air Force's primary airlift command, the Air Mobility Command.[28]

There has been much doctrinal principle written, backed up with much war and contingency experience, including the recent experiences in Desert Shield/Desert Storm and Bosnia, which documents the best way to organize to maximize the effectiveness of airlift forces.

> Airlift works best as a "seamless" system to accomplish the mission. It is a continuum of overlapping tasks and capabilities. Aircraft are but one part of the system that includes logistics, command and control, and transportation infrastructure.[29]

Lessons learned from Operation Joint Endeavor (United Nations' peacekeeping operation in Bosnia-Herzegovina, which began in December 1995) highlight very graphically the importance of *end-to-end control* to include planning and execution. Bear in mind this was a relatively small operation done in a permissive environment and the problems there would likely be magnified many times over in a large operation. General Robert L. Rutherford, Commander in Chief of USTRANSCOM, clearly articulated in his oral history the ramifications of dividing responsibilities for transportation assets between multiple commands.

> We were ill prepared to run that operation. When we think strategic lift, we don't typically think theater lift. What we needed to do over there was set up a Berlin Airlift-type operation, a shuttle operation. We were slow on the take there. We eventually got there, but it was painful. We wanted to hand massage each mission, when what we really needed to do was to establish a capability intheater and then let the user shuttle as he saw fit.
>
> We also learned that USEUCOM's organizational structure could not support the deployment. Their Air Force component, USAFE (United States Air Forces Europe), did not have the airlift expertise required. We had to go in and supplement it. As a matter of fact, we ended up doing it. They ended up, to a certain degree, supplementing us.
>
> I was troubled by the seam that developed between the C-130 operation and our strategic operation. That is not healthy. It was very confusing and disjointed the first couple of weeks. It got sorted out in time, I think, but

> it's something the Air Force and the joint community need to go back and address pretty soon. (emphasis added)[30]

Again, the C-130 assignment decision was properly reexamined with an eye not toward what is best for the Air Force organizationally in the short run; but rather, under a reengineered DOD logistics system, what will provide the nation with the most effective and efficient rapid air mobility capability worldwide. The issue of overall USTRANSCOM control of a true, totally integrated factory-to-foxhole distribution system likewise deserves continued consideration. In addition, although a much greater endeavor, with severe Title 10 ramifications for the services, is a continued review of the need and potential of creating a unified Logistics Command to unify joint maintenance, material, and weapons systems management. However, if a true RMA and corresponding revolution in defense logistics is underway, these are the types of organizational changes that will have to be considered for the full benefits of these revolutions to mature.

Overall, the shift in thinking from inventory to transportation is an evolutionary one with primarily cost-efficiency implications. New thinking about the early deployment phase as envisioned in Force XXI or Sea Dragon-type operations will require some radical thinking about the organization of our transportation and logistics functions. As indicated in our definition of an RMA, we must make the necessary organizational changes in order to fully exploit an RMA's potential.

On the cost-efficiency side, the stakes for successfully shifting from an inventory based system to one relying more on transportation are very high. The Air Force's Lean Logistics program is leading DOD in the effort to adopt this practice with the result being an expected (and already programmed) $4 billion in savings. Again, while not

revolutionary these savings are critical at the strategic level because DOD seems to be programming force modernization funding based on these savings from infrastructure reductions. A point to remember—real dollars have already been taken out of the budget.[31] In many ways we have reached a point of no return. In either case, there can be no compromise—the transportation system, especially air mobility, must work. And it must work well enough, and certainly well enough, that the CINCs can rely on it.

Substitute Real-Time Information for Maintaining Redundant Capabilities

The third fundamental change involves substituting valid real-time information regarding the complete status of all our resources, personnel, weapons, equipment, supplies and so forth, for our current practice of maintaining redundant capabilities. In other words, the successful deployment of an effective total asset visibility (TAV) system. As previously mentioned, just-in-time warfare means the wartime transportation system must work. It also means we must have the information systems to provide TAV.[32]

But again, these are not revolutionary. If there is any revolutionary thinking here, it will be convincing the DOD community, especially the warfighters, that within the context of battlefield awareness and dominance and deploying force survivability, logistics information will increasingly be applied as a strategic resource. The technology needed to attain real-time logistics information already exists. The challenge is to develop and deploy a broad-based workable system and then build the discipline throughout DOD and the services to adhere to the rules of the system.[33] Unfortunately, even the inefficiency inherent in the Desert Shield/Desert Storm logistics support

experience has not removed all of the institutional impediments to successfully fielding TAV in a timely manner.

For just one piece of the TAV system, ITV, the defense community has in the past been unable to make key development decisions. Although USTRANSCOM was the DoD executive agent, it did not have direct authority to take the necessary actions. In his oral history, the USTRANSCOM Deputy Commander in Chief (DCINC) expressed his frustration with the progress of the ITV program.

> My frustrations center on getting a decision as to what technology will be used within OSD so we can get on with fielding it. I think we are going about it slightly wrong. Too much time and effort is being spent debating specific companies' technology, what it can do or what it can't do.
>
> We have demonstrated technologies and capabilities. We have drafted requirements documents. We have briefed the senior leaders who have come to TRANSCOM. They all seem supportive, for some reason the bureaucracy is just terribly difficult to get through. I think we know what we need. I think the technology is there to meet the need. We just can't seem to bring it to closure.[34]

The stakes for assembling an effective TAV system are very high for DOD as a whole and all the services individually. It is increasingly clear, the DOD budget is a zero-sum game and every logistics dollar expended unnecessarily is a dollar lost from the modernization and operations side of the equation. With a large modernization bill to pay early in the next century, the logistics slice of the budget, consuming about 50 percent of DOD dollars, becomes one of the areas where DOD and the services will hope to find sources of savings to help recapitalize the operating forces.[35]

But most important, TAV must work in the operational setting. Experience shows that it does in a relatively permissive environment. During Operation Uphold Democracy in Haiti, the Army's 1st Corps Support Command provided ITV and TAV. Using a

system known as the automated manifest system (AMS) and a radio frequency tagging technique. These systems successfully provided intransit "in-the-box" asset visibility from the point of origin to delivery in the theater. Lessons learned from the operation were clear—ITV and TAV worked. The recommendation is that the system should be purchased, fielded, and implemented now, so it can be exploited for all supply movements in peacetime, as well as war, especially during deployments into a joint operations area.[36]

Unfortunately, some challenges do remain. Possibly the most significant threat to this concept will come from information warfare. As our *logistics information* becomes more of a strategic resource, we can be assured it will also become more of a lucrative target for our adversaries. Our logistics information systems, especially those operating in a highly decentralized mode, could be very vulnerable. This concern must be dealt with carefully since in a theater environment with only "just enough" capability on-hand, the lose of any significant amount of logistics material could be devastating. We do not yet fully understand the implications of effective information warfare. Our logistics information systems, with their high dispersal and possible future links to national industry and commercial vendors, could be very vulnerable to attack. In the future, we will have to ensure the integrity of the entire logistics system. A very serious "red teaming" effort should be started to find and fix problems in the system *before* an enemy finds them in wartime.

A second consideration, and one which could lead to revolutionary changes in this area, is building into the logistics information systems the capability to learn. To truly make the industry to foxhole system work as envisioned, it will have to be able to

"anticipate." This will require a "thinking" network. FM 525-5 is clear on the need for the ability to anticipate requirements.

> The focus of the tactical logistician is on the logistics sinews of manning, arming, fueling, fixing, moving, and sustaining the soldier and his equipment. Tactical logistics will continue to be one of the keys to more rapid tempo of operations. *Anticipation, long a goal of logisticians, can be aided by telemetry applied to both soldiers and equipment. To realize more rapid tempo, logisticians must look to increased asset visibility and means and methods to anticipate. (emphasis added)*[37]

Developing this capability will require much trust on the part of the warfighter and much training in the exercise environment. We should focus on anticipating and learning about the wartime environment—not about peacetime cost-savings.

Unfortunately, the focus of TAV and ITV leans towards cost-savings and is not truly revolutionary. In fact, much of the current ITV/TAV discussion is based on improving performance in a Desert Shield/Desert Storm-type scenario, something not envisioned for the Force XXI or Sea Dragon-warrior of the future. While logistics information will be important, more important to these warfighters will be more capable direct delivery and stealth logistics platforms from which they will receive their sustainment supplies. This equipment is clearly missing from any of the fundamental changes.

Modernization of Logistics Information Systems

The fourth fundamental change involves modernization of the logistics information systems to allow the "logistics revolution" to take place. There has been continued resistance since 1989 to DOD's efforts to implement the necessary changes. The efforts originating in the Corporate Information Management (CIM) plan envisioned savings of over $70 billion over seven years—enough money to fund the modernization of defense

computer systems and help bolster military readiness. Unfortunately, the plan was not as successful as originally envisioned and achieved few of the objectives promised. Clearly, those charged with implementing the CIM vision ran into some significant factors associated with service parochialisms, as well as the change of Administration in 1992.[38]

> Only one thing was certain: It wouldn't be easy to impose a common vision on the four armed services, whose rivalries are legend. As one retired Marine officer says, "Each service thinks they're the toughest or the best. And nobody from the Army or the Air Force, and even the Navy really, has any place coming in and telling [the Marines] how to do our job."
>
> Everybody wants to keep their own systems, for one. Plus, the services really control the money and the Office of the Secretary of Defense had no real authority to make people put the CIM tenets in place. All they really could do was try to encourage people to go in that direction.[39]

Improvements have been noted recently with respect to the services' willingness to cooperate in an attempt to realize the potential advantages of the CIM initiatives. This has been attributed to the downsizing and smaller budgets. According to the Assistant Director of the General Accounting office, "When CIM was first put in place, I don't think they were ready for change, but I think they're starting. We're starting to see a different trend and a different way of thinking over there."[40] Unfortunately, much time has been wasted.

Again, combat forces of the future will rely heavily on the premise of battlefield awareness and dominance and will require their logistics systems to interface and integrate within the overall system-of-systems. Our track record in the systems integration arena has not been impressive and yet much of the premise of this RMA is dependent on technology integration and information fusion. It is time to put aside all parochial interests, make the decisions, and get on with deploying these systems.

Again, this fourth change is not revolutionary from a strategic warfighting perspective. Although critical for future warfighter success, it too focuses on saving money for force modernization and readiness improvements.

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Chapter 5

Conclusions

We need to continue pursuing these changes in defense logistics. Even if many of the solutions were envisioned almost 50 years ago, they are still valid today. Maturing and emerging technologies and the potential changes being brought about by a potential general RMA throughout U.S. military forces, if not near-term budget realities, will drive these initiatives to completion. The current DOD plan is logical and with few exceptions certainly feasible with current technologies. The services, with the Air Force in the lead with Lean Logistics, are implementing the necessary changes to make the DOD vision a reality.

However, at this point in time, on balance it appears this "revolution" is really more evolutionary and primarily focused on cost-efficiency rather than being geared toward developing the logistics systems needed by the Force XXI and Sea Dragon forces of the future. In many ways, these four fundamental changes still appear to focus on traditional thinking about the way we have done deployment and sustainment operations, rather than the truly revolutionary technologies and equipment which will likely be needed in the future to ensure successful logistic support and survivability of our deploying "force projection" forces.

As shown, even in the evolutionary context, there will be some rough spots on the road ahead within each area noted in the opening definition of a RMA—doctrine, organizational change, and technology integration. Continuing open issues and challenges, such as the ones highlighted in this paper: continued development of effective logistics doctrine and training to use it, ensuring the maximum effectiveness of our precious mobility assets (as well as national level logistics and industrial base considerations), fielding ITV and TAV, and completing the modernization of our information systems, must be brought to closure. And while it is clear we will need the savings from these cost-efficiency efforts, we will need to keep one primary thought in mind—maximizing the effectiveness of the nation's logistics' capabilities for the future RMA-style, joint warfighting forces.

On balance, up to now our efforts have been more of an evolution than a revolution and primarily focused on cost-efficiency efforts. If Martin Van Creveld's assertion in the opening quote is correct and logistics makes up ninety percent of War, then we owe it to ourselves and the nation to give logistics its proper place and really have a revolution in defense logistics, one which will truly support the operations envisioned under Joint Vision 2010, Force XXI, and Sea Dragon. We've been trying to have this revolution since our first modern deployment overseas during the Spanish-American War in 1898—it has been long enough.[1]

Most importantly, the prime driver of logistics reform must be military effectiveness. The highly mobile flexible forces envisioned by RMA advocates will not work with the old, sluggish logistics system. But, if we are not careful, uncritical adoption of business practices could lead to a cost-efficient but fragile system. Much work (wargames,

exercises, extensive red teaming) remains before we get the right link between the new logistics and the new strategy.

Notes

[1] Ibid., Schrader, 147.

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