

**STRATEGY
RESEARCH
PROJECT**

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

**CRITICAL INFORMATION TECHNOLOGY MUST BE FUNDED TO
ACHIEVE A SUCCESSFUL REVOLUTION IN MILITARY
LOGISTICS**

BY

**LIEUTENANT COLONEL KURT WEIDENTHAL II
United States Army**

**DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.**

USAWC CLASS OF 1998

U.S. ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013-5050



DTIC QUALITY INSPECTED 2

19980520 139

USAWC STRATEGY RESEARCH PROJECT

**Critical Information Technology Must be Funded to
Achieve a Successful Revolution in Military Logistics**

by

LTC (P) Kurt Weidenthal II

Bernard Griffard, Associate Professor
Project Advisor

The views expressed in this paper are those of the author and do not necessarily reflect the views of the Department of Defense or any of its agencies. This document may not be released for open publication until it has been cleared by the appropriate military service or government agency.

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

DISTRIBUTION STATEMENT A:
Approved for public release.
Distribution is unlimited.

ABSTRACT

AUTHOR: LTC(P) Kurt Weidenthal II

TITLE: Critical Information Technology Must be Funded to Achieve a Successful Revolution in Military Logistics.

FORMAT: Strategy Research Project

DATE: 12 March 1998

PAGES: 46

CLASSIFICATION:

Unclassified

The Chief of Staff Army (CSA) has placed automation as one of his top three priorities in the Army. He has set the stage for the Army's future which is outlined in his book Vision 2010. His impact on the Revolution in Military Logistics (RML) has moved him to declare there can be no Revolution in Military Affairs (RMA) without an RML.

As the Army prepares to enter into the 21st Century, it's critically recognized that logistics plays a more important role than ever before in our history. Today, and in the next two decades, advanced information technology will become the backbone of our distribution-based logistics system as the Army seeks to increase accuracy, speed, and volume of logistics information available to senior warfighters.

The purpose of this document is to focus on two key information enablers that must be incorporated into future war time scenarios to ensure the Army's strategic successes--especially if a crisis was to occur in the near future.

Modernization is essential to ensure we advance into the future with the most capable Army in the world. Key information enablers, especially the Total Asset Visibility (TAV) and the Movement Transportation System (MTS), must be funded and fielded. It's a tough challenge for the logistical community. But--I believe it can be accomplished!

DTIC QUALITY INSPECTED 2

TABLE OF CONTENTS

ABSTRACT	iii
LIST OF TABLES	vii
INTRODUCTION	2
FORCE XXI--AN AGGRESSIVE LOGISTICAL CAMPAIGN	4
THE REVOLUTION IN MILITARY LOGISTICS (RML)	5
Focused Logistics	7
MODERNIZATION REQUIREMENTS AND INITIATIVES	8
Military-Industry Partnerships	10
Exploit Existing Technology	12
The Focus Now and to 2010	14
Rapid Power Projection	15
RML'S MOST IMPORTANT MISSION: FORCE SUSTAINMENT	18
Enablers for a Successful RML	19
Total Asset Visibility	20
Movement Tracking System (MTS)	23
LOGISTICAL PURSUIT OF THE ARMY AFTER NEXT	27
CONCLUSION	29
ENDNOTES	31
BIBLIOGRAPHY	35

LIST OF TABLES

Table A. TAV Budget and Program Data	22
Table B. MTS Budget and Program Data	26
Table C. RML Support to Army After Next	28

Synchronization of logistics with combat operations can forestall culmination....At both tactical and operational levels, theater logistic planners forecast the drain on resources associated with conducting operations over extended distance and time. They respond by generating enough military resources at the right times and places to achieve strategic objectives before reaching their culminating point. If the commanders cannot do so, they should rethink their concept of operations.

**Joint Publication 3.0: Doctrine for
Joint Operations (February 95)**

Never before in the history of the United States Army have our senior leaders discussed, realized, identified and planned such a significant future role for the entire realm of logistical support to our forces. In fact, so much discussion about recent conflicts, such as Desert Storm, and the future application of visionary ideas and emerging technologies will ensure logistical planning and synchronization plays an extremely important role at all levels of military operations. No senior combat leader in command of modern forces will want to go down in the annals of history as the one who "lost the big one", or couldn't "respond to an order" because he logistically overextended his forces. Today's combat leaders depend on their senior logisticians to inform them of the sufficiency of resources available and the overall adequacy of the logistics system's ability to respond to the operational

situation. Risks and possible contingencies must be wargamed integrally to enable the sustainment of combat forces.

Task Force XXI, Joint Vision 2010, Army Vision 2010, and Army After Next (AAN) have set the Army on a glidepath to ensure the critical role of strategic logistics is properly focused towards the future. The plans and objectives of our senior logisticians, developed over the past few years, have many roots. Moreover, supportive opinions and varying priorities from army schools and senior tactical commanders have assisted in ensuring "the role of logistics will become even more important as modern warfare increases in technological sophistication, speed, and complexity--resulting in a **Revolution in Military Affairs (RMA)**."¹ Our troops will fight in a dramatically different way than they do today. Without first changing how military forces are projected, there can be no RMA--especially since the RMA is the catalyst for a new Army.²

INTRODUCTION

Joint Vision 2010, issued in July 1996 by the Chairman of the Joint Chiefs of Staff (CJCS), set the stage for how the armed forces would pursue future missions and requirements. Utilizing opportunities in technology would channel innovations to achieve higher levels of effectiveness in military operations. Moreover, the most significant technological innovations use information superiority as their primary

thrust, the backbone, to ensure success in future operations-- both in peace and conflict.³ The Army has proceeded with implementing Joint Vision 2010 in a way that maximizes the CJCS's intent to "develop new concepts, technology demonstrations, and joint exercises."⁴ To prioritize the "tasking", the Chief of Staff of the Army (CSA) commissioned an AAN project, while providing specific guidance that the final product would be definite--the bridge between the heavy and light forces would be narrowed to improve mobility, enhance firepower, and, especially to revolutionize logistical concepts! His specific guidance was to "revolutionize logistical concepts....continue developing total asset visibility and velocity management."⁵

The primary purpose of this paper will be to express the key successes and prove why select critical advanced information technologies must continue to be funded and fielded in order to keep pace with 21st Century logistical, strategic, and operational objectives. Two essential enablers that demonstrate my point are the **Total Asset Visibility (TAV)** program and the **Movement Tracking System (MTS)**. Both are information-based, logistics distribution enablers that will make an enormous difference now and a significant difference to future warfighters. To understand the overall logistical scenario of what drives the present situation, the prevailing revolution--the **Revolution in Military Logistics (RML)**--must be

examined. Outgrowths of this logistics' revolution are its modernization requirements and initiatives. In order to comprehend the technological advancements that must occur by 2010, the modernization picture--as it exists today--must be understood, for rapid force projection will not happen without the accomplishment of necessary logistics initiatives. Next comes RML's most important mission of the decade and beyond--Force Sustainment. Sustaining the forces on the future battlefield will occur with the critical enablers identified primarily by the logistical community. A good logistician is always planning and forward looking. Concluding discussion will center on the rapidly evolving **Army After Next**. Here, providing updated common pictures and emerging technologies by 2015 extends robust electronic warfighting and unparalleled information technology.

FORCE XXI--AN AGGRESSIVE LOGISTICAL CAMPAIGN

A concept for the evolution of full-dimensional operations for the strategic army of the early Twenty First Century. Force XXI is driving technology to provide data collection; analysis, fusion and processing; and information dissemination systems. The Army today has the potential to revolutionize military logistics in the information age as we move swiftly toward Force XXI and the Army After Next.⁶

Colonel Steven F. Garrett. Chief, Initiatives Group. U. S. Army Forces Command. Quote in article entitled "Synchronizing Battlefield Logistics":
Military Review dated March-April 1997.

The Army's plan for modernizing its forces in the 21st Century revolves around exploiting technology and a new and

revived look at logistics. "The transition of the Army into a fighting force for the next century--identified as Force XXI--will be accomplished through leveraging the power of the information age."⁷ A key member of the logistics community, the Army Materiel Command (AMC), is committed to accomplishing Force XXI objectives through innovation and creative exploitation of advanced technology. The convergent factors of decreasing funds, less personnel, and transition to a power projection Army mandate that AMC's contributions are vital to maximizing any and all opportunities available.⁸ While difficult as it will be to equip the forces during the transition, a RML is in place to accomplish this challenging task.

THE REVOLUTION IN MILITARY LOGISTICS (RML)

"A Revolution in Military Logistics, leveraging technology to fuse new concepts, information, and logistics systems, reshaping the way we project and sustain America's Army in the 21st Century."⁹

The Capability is on the Horizon:
Preparing for the Revolution in Military Logistics.

Document signed by LTG Coburn, Army DCSLOG,
and Mr Robert M. Walker, Ass't Secy of Army
(Installations, Logistics and Environment)

July 1997

As technological sophistication becomes the way of fighting a modern war, so does responding to all the other aspects of a RMA. This RMA provides the U.S. Army a basis for developing compatible changes in strategic logistical support. The result--a vision now known as a bona fide and legitimate

Revolution in Military *Logistics*. Key to applying this vision is comprehending the intent of RML--that is, "to transform Army logistics into a distribution-based system that substitutes logistics velocity for logistics mass to provide the right stuff at the right place, at the right time and....at the right value."¹⁰ To reiterate the importance of these new concepts GEN Reimer stated "There can't be an RMA without an RML."¹¹

All actions and planning in this arena must remain on a parallel course. All must remain focused on a plan that supports the Army After Next--not just today's mission requirements. This concept was briefed to an Executive Logistics Seminar on September 23, 1996. As stated at the time, the campaign plan that leads the Army through a Revolution in Military Logistics will focus on AAN objectives. The plan encompassed three phases: 1) Key actions for 1998 (FY97 through POM years), 2) Force XXI through POM years 2010 and 3) AAN FY 2010 through 2025.¹²

This plan will have as its primary goal--ensuring our forces are projected and sustained to meet both today's demands and those of future conflicts. By working together in partnership with DoD civilians, industry, and active and reserve forces, we will be able to produce the most responsive, efficient and reliable logistics team in history.¹³ Senior Army leaders must synchronize their visions and exploit their synergies to ensure a successful RML. For instance, they also

agree and accept the fact that the traditional means of supporting the forces with large stockpiles of equipment and supplies are no longer feasible. Budget reductions will not allow it, and even more importantly--movement of large support requirements is counter to effective power projection operations.

Focused Logistics

Clearly focused logistics is the most applicable operational concept across the spectrum of crisis. No other concept is executable without focused logistics, yet focused logistics is an operation which could stand alone, particularly in humanitarian operations. Inasmuch as the Army is organized and equipped to sustain itself in long-term, austere operational environments, it is especially suited to react quickly when called upon to provide logistics support for both domestic and foreign natural or man-made disasters¹⁴.

**General Dennis J. Reimer: book entitled
Army Vision 2010. Washington: U. S. Dept
of the Army. 1996**

Focused logistics is the bedrock of technological systems under development that will apply the "fusion of information, logistics, and transportation technologies to provide crisis response, to track and shift assets even while enroute, and to deliver tailored logistics packages and sustainment directly at the strategic, and operational level of operations."¹⁵ Our ability to dominate any adversary and control any situation--to obtain "full spectrum dominance"--will require a timely and accurate distribution-based logistics system. Indeed, "focused

logistics" will call on technology as a primary logistical enabler.¹⁶ This automatically infers that this process will play a major role in a course outlined by warfighters. A distribution-based system optimizes the synergy of information supremacy and distribution agility to replace logistics mass with logistics velocity.¹⁷ Various information systems have been identified to provide the desired end state--total support to the warfighter. Certainly, continued and aggressive exploitation of technological innovation that the Army plans on implementing by 2010--coupled with information superiority--will contribute greatly to the desired "focused logistics". And as stated, to gain its confidence, all individual initiatives must be reliable.

MODERNIZATION REQUIREMENTS AND INITIATIVES

As representatives of the American people, you have strongly supported our programs and helped to guide them to fruition. The Army has been a careful steward of the resources provided, but our success would not have been possible without your advice and support. It is imperative that we maintain the Army's technological advantage on the battlefield. Modernization is essential as we transition today's Army into a 21st century Army--Force XXI. Continuous modernization is one of the keys to dominance on the future battlefield and the key to readiness for unexpected challenges of the 21st century.¹⁸

**The Honorable Gilbert F. Decker, Assistant Secretary
for Research, Development and Acquisition Armed
Services to Committee on Armed Services, 104th
Congress, Fiscal Year 1997**

As the Army reduces its size, it must respond to this situation with the most technological advancements in the future--since its objective is to remain unmatched in overall strength by any adversary in the world. To ensure this effort remains focused, a modernization strategy was developed. The five objectives to focus this modernization program are: Project and Sustain the Force; Protect the Force; Win the Information Battle; Conduct Precision Strike; and, Dominate the Maneuver Battle.¹⁹

Of course, superior logistical sustainment during future warfare will most likely be attributed to an outgrowth of increased technological sophistication. Constant and consistent modernization efforts will drive, not only our logistical support, but play a major role in the RML campaign--improved reliance on civilian industry. Specifically, a revolution in business affairs is a key RML enabler. The essential elements for engineered business processes are our "strategic partnerships...Industry, Government, Joint and Services."²⁰

During these periods of dwindling resources and desire to keep those basic functions that ensure readiness, there are two proven courses of action for gaining Congressional funding support for modernization. First, the Army must capitalize on technology transfer--make purchases from commercial off the shelf (COTS). In this regard, Congress would simultaneously support the economy as the Army modernized itself. Second, the

Army must take advantage of recent modernization advancements, cross level and combine existing systems as appropriate and exploit these as "new" technological enhancements themselves. The benefits are numerous to the amount and type of already employed systems in operation that can be integrated to create new technological enhancements.

Military-Industry Partnerships

The Army regularly keeps abreast of new developments in the commercial sector while looking for military applications. This application of technology is of increasing importance to the Army's science and technology program.²¹ The Army recently initiated a M109 Family of Vehicles (FOV) Fleet Management pilot program with this as one of its primary objectives. Utilizing a "fleet manager," "the goal of this program is to make revolutionary changes to the Army logistics system to achieve engineering and logistic improvements that result in reduced operational and support costs along with enhanced performance of the weapons system. Fleet management will test concepts and provide lessons learned to life cycle support initiatives."²² The "Fleet Manager" program should enable immediate feedback from the use of existing "off the shelf" equipment, spares, etc and act as a focal point for all customer requirements for life-cycle support during both peacetime and national emergency.

In military logistics, the end user could establish an informational junction with a commercial vendor. Based on the Army unit's application requirements, the vendor can estimate and provide expeditious response time. For advanced technology application, "this approach offers considerable promise. The chief idea is to devise a logistics system that incorporates distinctive technologies and exceptional organization, with an eye to shortening delivery time to the end user."²³

Steven Ferris writes in the August 1997 Parameters magazine, logistics (modernization) paradigms are being compared. Civilian technologies will continue to replace highly specialized military applications, while private firms will displace Army support activities. We will see that modernization efforts evolving in the 21st century will become more partnership with the commercial vendors mentioned above. This program will feature joint logistics systems in lieu of more traditional individual service systems. This too, becomes a key selling point for gaining congressional support--while the services travel down their road of creative modernization. Given the scope of this effort, Army "logistics will expand its inclusion of civilian personnel and technological products. Customer service will drive the logistics process, becoming the sine qua non for system assessment and design."²⁴ What's more, as the Army begins to maximize information technologies, which play a vital role in logistical support, military and civilian

precision systems will enhance capabilities of force projection. "In the future, commercial firms will provide the vast majority of military logistic requirements, with a much smaller portion provided by defense-unique companies and military depots. Commercial firms will become 'linked at the hip' to the military--even during the heat of conflict."²⁵ Recent reform initiatives in acquisition strategies are enabling the Army to eliminate the cumbersome military specifications from contract solicitations. This has aided greatly in the Army's ability to make "off the shelf" purchases and gain the support of Congress for valuable funding.

Exploit Existing Technology

The other method of quickly and efficiently modernizing the Army revolves around the abundance of existing technologies. The Army must further develop, exploit and research these technologies. One of the key considerations will be to determine just how far advanced the technologies will enable the Army to modernize. Once this is determined, the next consideration is to compare the capabilities of a piece of equipment, for instance, to a similar military item. If that Army item can't perform to the designated standards of the commercial piece of equipment, each piece of equipment would then be evaluated on its own merits. This will be a key component of the Army's modernization program over the next decade and beyond.

This method is similar to what then Vice Chairman of the Joint Chiefs of Staff Admiral William Owens referred to as the "system of systems"--an emerging military instrument.

Operational synergies are created by combining three systems normally considered separately--those that provide battlespace awareness, those that enhance command and control and those that create precision force. Successful integration of such capabilities might enable totally new and improved means of power that are even more accurate and can be used over far greater distances than earlier this decade.²⁶ Many specific roles of this instrument are still emerging as research and development continues.

One thing is for certain, in light of reduced funding, the Army must explore this opportunity to the maximum extent possible while calculating technological breakthroughs. When discoveries of this magnitude are uncovered, the Army must capitalize on them and distribute the advantages across the armed forces. The good news is that the Army will continue to modernize well into the 21st Century: the bad news--it will be a slow, and at times, painful process. Still, the U.S. will remain the technological leader in the world if it continues to make smart decisions by digitizing and fielding such enablers as the TAV and MTS.

The Focus Now and to 2010

The user now sees, and will continue to experience, a reshaped logistics infrastructure that contributes to the speedy delivery of materiel and equipment. Indeed, Velocity Management and a distribution-based system are the intents of RML and are the focus of the world of logistics as it changes around us today.²⁷ The Army must pursue technological advantages to assist in the transformation from a supply-based system to a distribution-based system. The system in place now consists of over-sized stockpiles with extremely inadequate in-transit visibility. Army Vision 2010 captures the "synergy of dominant maneuver and precision strike to replace force mass with force effect. Similarly, a distribution-based system capitalizes on the synergy of information supremacy and distribution agility to replace logistics mass with logistics velocity."²⁸

The overriding objective is to reduce the stockpiles of supplies. Several on-going strategic initiatives can significantly reduce the commonly referred to "logistics footprint." These include: treated indigenous water (30% reduction), alternate fuel, freeze dried fuels (50% reduction), ammunition for precision strike use (70% reduction), and repair parts for tailored maintenance/distribution (75% reduction).²⁹ Likewise, direct deliveries to the ultimate users will reduce

the need for redistribution, thus saving dollars on the unnecessary use of vehicles, fuel, and personnel. However, direct deliveries must be tracked while in-transit, or there is a high probability there won't be any delivery at all! Once again, the need for innovative technology--TAV and MTS--demonstrates how essential it is for these enablers to play a major role in a successful distribution-based logistics system. The "footprint" of material and supplies will be significantly reduced by the active use of TAV and MTS.

Rapid Power Projection

In the 21st Century, the Army must optimize all known and available resources to strategically project power through rapid deployment from the continental United States to anywhere in the world--versus the past focus of forward basing. The existing power projection focus places an enormous logistical strain on overseas operations. Specifically, information technology and systems have not been fully funded and fielded to track equipment and requisitions that will be required in this type of scenario. In the Secretary of the Army's book entitled United States Army Posture Statement FY '96, The Honorable Togo West states: "A power projection strategy demands a robust logistical base to sustain deployed forces. Through emerging concepts such as split-based operations and total asset visibility, the Army will ensure efficient support when deployed."³⁰

This was the case during several operations of the 1990s. The force projection process did not operate as envisioned. Many combat service support units found themselves with large stockpiles of material and, vital information that could have allowed immediate decisions to be made was not available. Operations Desert Shield and Desert Storm produced severe shortfalls in linking and maintaining visibility of the equipment and supplies transported to theater. At one point, General Schwarzkopf was forced to reprioritize the use of transportation assets to combat forces. Since U.S. Forces had minimal in-country capability to store and retrieve equipment and supplies, available host nation assets also assisted in the operation. Logistical units had the mission of providing and delivering overall support to the theater. In some cases, locations and quantities of supplies could not be verified and in many cases units were not being sustained.³¹ The Army's shortage of transportation managers complicated matters. As ocean shipping containers arrived in country, they overwhelmed the tracking management process. Supplies shipped in containers were addressed to several recipients, or the container contents were unidentifiable because of inadequate or missing documentation. This lack of documentation also affected the tracking of the material. Approximately 50% of the containers arriving in theater had to be opened to identify and reallocate the contents. Units quickly lost confidence in the system and

reordered items they believed to be lost in transit. This exacerbated the supply problem throughout the entire cycle.³² A working TAV and MTS could have prevented many frustrations and failures of our logistics system in place at the time. TAV and MTS must be funded, fielded and prove themselves as successful enablers, to restore confidence in the logistics system. Only after full restoration of this confidence can force projection logistics succeed. There must be a culture change, and effective TAV and MTS are essential to achieving this culture change.

To fulfill the intent of power projection, the Army's contingency forces must be able to deploy faster, across the globe-- both strategically and operationally. Support missions must be accomplished in hours versus days. CONUS based contingency logistics forces must be rapidly projected "by modernizing force projection concepts, and developing capabilities to quickly provide logistical support without large infrastructure."³³ This leads to a reduction of Combat Service Support requirements. Material must still be tracked in one way or another. Exploiting information dominance during operations will enable rapid and reliable battlefield synchronization. Emerging enablers such as the TAV and MTS have the proven capability to perform this invaluable mission.

RML'S MOST IMPORTANT MISSION: FORCE SUSTAINMENT

Of the three functional domains--technology application and acquisition agility, force projection, and force sustainment--none captures the essence of a Revolution in Military Logistics than force sustainment. "It is here that an evolutionary and revolutionary logistics modernization come together. We must synchronize our transition from today's Army through Force XXI to the AAN. The synergistic effects of these efforts and our ability to properly balance peacetime efficiencies with warfighting effectiveness will determine how well we can perform our primary logistics responsibility of maintaining force readiness in peace and sustainment of the forces in all operations."³⁴ Unquestionably, our abilities and performance for successful force sustainment will be driven by logistics automation. From a logistics perspective, the needs of the Army can best be met with information-based upgrades, purchases and advanced development for future fieldings. This is a top priority for the Army's senior leaders and must remain so. On January 14, 1998 the DCSLOG of the Army, LTG John G. Coburn, sponsored a Senior Logistics Seminar at the U.S. Army War College, Carlisle Barracks, PA. In attendance were the Army's senior three and four star logisticians and their industry counterparts, to discuss the roadmap for the RML. In his opening remarks, LTG Coburn reiterated the CSA's three top priorities--"Crusader, Apache and Logistics Automation."

Additionally, integrating support at all levels and across all services promises improved digital interfaces. Again, purchasing and fielding the TAV and MTS enhance successful force integration and sustainment!

Enablers for a Successful RML

The Army's revolution requires a distribution-based system. To succeed and ensure benefits are realized now, and in the future, continued funding and fielding of two advanced information enablers--the TAV and the MTS--must not fail. Both support the existing RML vision of the Army's senior leaders. Undeniably, these two enablers are the type that will provide the 'focused logistics' the Army so desperately requires. The TAV and MTS are keeping pace with most ongoing modernization efforts and clearly play an invaluable role in force projection, and an even more important role in force sustainment. A distribution-based system providing key enablers--TAV and MTS--will provide logisticians tools to maintain and sustain the Army. Also, both are excellent examples of how the Army can prosper by utilizing civilian industry to purchase existing technology and benefit from future discoveries.

Logistics management functions have become more complex and will continue to become more complicated on the battlefield as we near 2010. As a result, multifunctional logistics systems

will require increased automation support to respond and provide necessary processed data. The amount of materiel being transported through the pipeline exceeds the ability to manually track materiel, maintain correct records and provide real time information to key decision makers. TAV is, and will, continue to be linked with future successes in advanced information technology. Presently, the key challenge for TAV is achieving Army-wide implementation while adjusting to on-going budget decrements.³⁵

Total Asset Visibility

TAV is a valuable capability that compiles information from many automated information systems and provides asset location, quantity, condition and the movement offsets. A key element of TAV is its enabling Automatic Identification Technology (AIT): Radio Frequency (RF) technology, Automated Manifest System (AMS) and Mobile Communications Terminals (MCTs). The RF tags provide content and in-transit visibility and AM optical memory cards containing cargo manifest data attached to sustainment shipments originating from depots. Interrogators placed at transportation nodes read the tags and pass data to a regional server for display in TAV. In Europe, for example, MTSS installed on truck or rail cars provide satellite tracking capability to monitor truck convoy and rail

movements within Germany, Hungary, Croatia, and Bosnia.³⁶ TAV provides significant advantages that:

- allow managers to conserve scarce resources by reducing duplicative procurement
- facilitate redistribution of assets within Army and DoD
- reduce timeline for receipt of items
- enable Commanders to better evaluate logistics supportability of OPLANS and modify courses of action if necessary
- improve the 'in the box' visibility and location of theater sustainment shipments
- improve visibility of in-theater truck convoy and rail movements.³⁷

The Army's position on TAV/ITV is straight forward. TAV/ITV services critical management needs to reduce duplicative procurement, meets mandated cost reductions and provides logistics systems efficiencies set forth in Defense Management Review Decision (DMRD). Used by item managers, TAV will provide the Army dynamic communications, well into the 21st Century, that are technologically superior and more cost effective than any other known system.

The most current review of TAV reveals that it is being used successfully in support of Joint Endeavor/Joint Guard, and was used to track repair parts on commercial air pallets transported to Korea in the Reception, Staging, Onward Movement and Integration (RSOI) 97 Exercise. More significant is the fact that RF is already installed at 69 sites in Europe, 22 sites in Korea and 8 U.S. sites. TAV has been effective, efficient and convincing to guarantee its continue use. Shown

on Table A are the budget requirements and approved funding dollars to date for the TAV--a Tier I enabler.

Table A. TAV Budget and Program Data
(\$M) as of January 97

	Remain	Prior	Current	Budget
	(FY90/FY97)	(FY98)	(FY99)	(FY00/ 03)
OMA	20.58	9.62	8.93	38.59
OPA	25.69	7.30	14.81	66.83
DBOF	.26	0	0	0
Total	46.53	16.92	23.74	105.42

Although funding had been approved for TAV, during the period FY90 to FY97, approximately \$4.4M was decremented. In FY98, already approximately \$1M has been decremented for other programs (New "total is only \$16M). The Army's senior leaders--not just logisticians--must take a firm stance together and refuse to allow further reductions to this program. Another important linkage for fielding the TAV revolves around supporting the five Science and Technology (S&T) management principles. These principles, which are articulated in DoD's S&T strategy promote the following for any given military purchase:

- transition technology to address warfighting needs
- reduce cost
- strengthen the commercial-military industrial base
- promote basic research
- assure quality

The S&T program provides the greatest path for the rapid insertion of new technologies into Army systems.³⁸ Here again the TAV fulfills all the critical requirements for further fielding into the 21st Century. In addition, the Army TAV represents the Joint TAV (JTAV) initiative. As such, this program will increase in size and set new landmarks for tracking materiel pertaining to all the services. CINC logistics staff organizations will reduce their inability to obtain particular information using supporting automation communications. JTAV will provide an exchange of information between component and staff functional systems. This capability will then increase the staff's communication process to ensure better synchronized and the logistics operations execution among the engaged components.³⁹

Movement Tracking System (MTS)

Another invaluable information based enabler that can make a considerable difference in the future logistical support provided to the warfighter is the MTS. The MTS has similar characteristics to the TAV and is also equally representative of abiding by the "rules" for a successful revolution in military logistics. The MTS is a crucial enabler that provides the capability to track progress and communicate with the operators of tactical wheeled vehicles. By using positioning and communication satellites, transportation movement control and operator sections can identify the location of the vehicles

and then communicate with them.....anywhere in the world!
Positive control of assets can be maintained, while ensuring time definite delivery of supplies and services.⁴⁰

In fact today, the MTS is greatly needed to support the Army's modernization objective to project and sustain the force. Exploiting these advantages of the MTS will provide that capability:

- MTS' near real time position location and messaging capabilities allow a level of asset control never before attained
- Combat Support and Combat Service Support managers will be able to truly maximize the efficient use of their assets through the rerouting of moving convoys
- force protection of wheeled vehicle operators is enhanced. Drivers can be informed, while enroute, if a threat develops as they pursue their mission
- operators would have the means to request all levels of assistance from their unit while outside of the normal communication range. Medical, maintenance and supply support could be exceedingly improved
- MTS provides the distinct capability to synchronize resupply actions with the fluid movements of maneuver forces ensuring that the right resources are in the right place at the correct time
- MTS is a proven and effective means of implementing the Force XXI concept.⁴¹

The existing MTS is an industrial product that comes directly COTS. Still, digitizing the tactical wheeled vehicle fleet is truly revolutionary. The MTS technology has proven reliable and has been used by modern over the road trucking firms for a number of years. Since 1994, the U.S. Army has worked to prototype and develop the MTS to support exercises and contingency operations. To increase the total efficiencies of the overall program and to coordinate this crucial military-

commercial partnership, a Project Manager (PM) for the MTS was established in 1997.⁴²

To date, fielding of the MTS has been approved to solely enhance the Palletized Load System (PLS). Its engineering, experiments, and testing have proven extremely successful. During a major exercise in September, 1997, the 396th Transportation Company stationed at Ft Lee, Virginia deployed to the port of Savannah for Bright Star 97. Utilizing the MTS, there was a near 100 percent success rate in reading the tag registration numbers that were affixed to all test vehicles--for tracking vehicles and their contents.⁴³ Final reports indicated the MTS was successful and provided operators and managers necessary intransit visibility--a required component of TAV.

At issue is the future basis of fielding and funding. Presently, the Army's position is to accelerate the fielding of required MTS to a digitized division around the summer of 1998. However, this fielding applies to the Palletized Load System-Enhanced (PLS-E) only. Hence, the goal of the most current proposal requests an accelerated procurement of MTS for use with other CS/CSS units. Indeed, MTS application could play a critical role in meeting major support requirements in peace and conflict of Ordnance, Medical, Military Police, and Quartermaster units.⁴⁴ Indicated at Table B is the funding requirements data for the MTS:

Table B. MTS Budget and Program Data
(\$M) as of December 97

	<u>FY98</u>	<u>FY99</u>	<u>FY00</u>	<u>FY01</u>	<u>FY02</u>	<u>FY03</u>	<u>Total</u>
RDTE	.7	.7					\$ 1.4
OPA:							
REQ	2.8	2.8	15	15	15	15	95.6
Funded	0	0	0	0	0	0	0
Delta	2.8	2.8	15	15	15	15	95.6
Request	2.8	2.8					5.6
Tot R'ed	3.5	3.5	15	15	15	15	97
QTY of :							
--MTS	520	519	2706	2706	2706	2706	30,289
--MTS-CS	61	60	386	386	386	386	3,773

Again, FY98/FY99 Warfighting Rapid Acquisition Program (WRAP) funds will enable fielding of the MTS for PLS-E only. Depicted above, the \$7M (\$3.5 in FY98 and \$3.5 in FY99) would enable fielding of 1039 each MTS to the most critical tactical wheeled vehicles, commanders and operations sections in one digitized division and selected Corps slice units. Yet I maintain, MTS in one division is inadequate at best. Fielding and funding for identified critical corps slice units--one MP Battalion, two Corps Support Group (CSG) battalions and two functional battalions are the next Army priority.⁴⁵

Increased funding for the MTS must be set in motion as soon as possible. Similar repercussions related to not fielding the MTS are similar to the TAV--especially if another Desert Storm scenario develops. In other words, even a digitized division receives supplies and equipment through Corps units.

Corps units must support capabilities to be responsive. The MTS will greatly contribute to the focused logistics and single logistics theme--both strongly enhance a successful logistics revolution. By funding and then fielding the MTS to selected units, the stockpile of supplies and equipment can be avoided. Furthermore, positive control of critical assets can be maintained, dispatched vehicles can be redirected, and ITV can be established. The U.S. Army doesn't need another conflict to prove that only if the MTS had been available and in use, it could have easily paid for itself and saved the government millions of dollars.

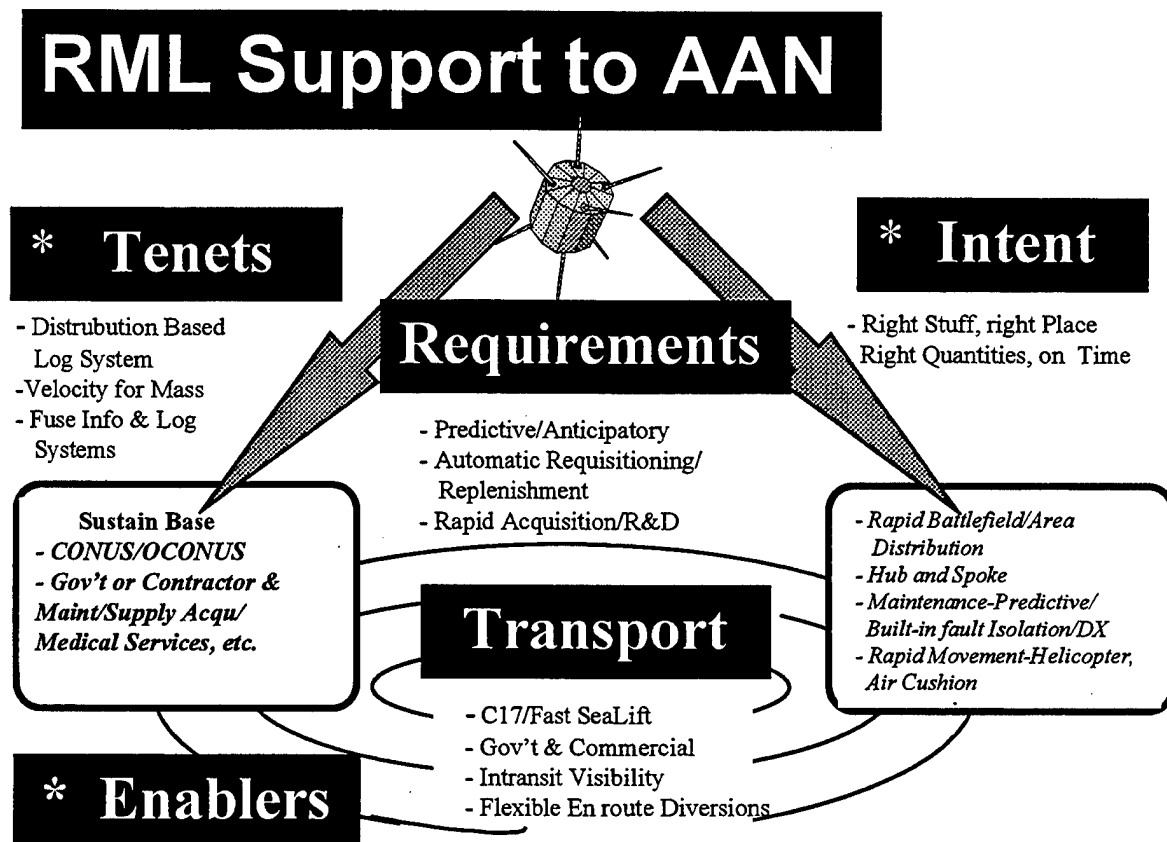
LOGISTICAL PURSUIT OF THE ARMY AFTER NEXT

Logisticians are planning and designing Army After Next concepts to keep pace with future requirements that will surface from the CINCs at any time. Planning in these cases is totally visionary--that is 2015 and beyond--and will depend on the implementation of decisions made "today". With power projection applications and utilizing logistical "reach back" concepts--calling for logistics assets from CONUS--one sees the absolute and increased critical nature for tracking required material and equipment in the future to accomplish this goal.

To put this vision in perspective, AAN is comprised of significant differences from today's operations. Revolutionary

support requirements will occur. And remember at this juncture, specific planning without knowledge of new weapons systems to be fielded will be extremely difficult. Still, a well synchronized transition plan will result in meeting the goals of AAN. As insights, issues, and concepts emerge, and sufficiently mature, the following vision can emerge into a prominent strategy. The Army's complete approach to AAN, as of this date, is depicted on Table C.⁴⁶

Table C. RML Support to Army After Next



Senior logisticians have alertly perceived that a single logistics system remains a key strategy to ensure this complex vision becomes a reality. As new doctrine is approved and

implemented, logistics systems must correspondingly be creative and responsive. Logistics as we know it this decade, will become foggy in the 21st Century, especially between the traditional tactical and strategic operations. Technology will play the major character role in future logistics if support to the end user is going to be successful. Systems to acquire advance technology must be defined and supported. Automation--especially information based--will remain the backbone of AAN. Large systems such as the Global Combat Support System (GCSS) and the Global Combat Support System-Army (GCSS-A) must be further developed, researched, and programmed for acquisition. Force sustainment requires this logistics process.....which in turn will produce a new logistics concept for AAN.

CONCLUSION

Logistics in the future will face unrivaled challenges. "The influence of technology on the logistics system of the 21st century will be pervasive, affecting virtually every aspect of the logistics process."⁴⁷ Information and communication technologies must continue to be developed and improved. Seeing the battlefield, ensuring seamless logistics support, and providing on-time and correct supplies and equipment are essential. Tier I enablers such as The Total Asset Visibility and Movement Transportation Systems will contribute to this future advancement. These important strategic enablers are currently receiving funds and must not

be decremented. Likewise, enablers in dire need of funding to test and expand the fielding of equipment i.e MTS, must be supported. There are no known outrageous or hidden costs involved in funding these two enablers. If logisticians are unable to support a war related operation effectively, everything else becomes immaterial. In an operation, many logistical culminating points could be reached. "Successful conflict execution and termination will depend upon multinational commitment, joint operations, and the flexibility to adapt to, and support, new and unforeseen forms of combat."⁴⁸ Required synchronized logistics support in the 21st Century will be the standard; therefore, the necessary advanced information technology must be funded and fielded. Receiving early priority must be the basic systems that will allow the Army to move, track and account for materiel and supplies. These are the same basic systems that are in common use today by all major civilian sector surface and air carriers. The Revolution in Military Logistics is well underway. To be successful, the Army's glidepath must continue to leverage technology to fuse new concepts, information and logistics systems to meet goals established by Army After Next. This will be extremely difficult, especially since a roadblock is traditionally the funding and fielding for new or existing programs. The Army requires strong support over the next 10 years to break that traditional mold!

(7202)

ENDNOTES

¹Robert M. Walker and John G. Coburn, Preparing for the Revolution in Military Logistics: The Way Ahead. (Washington, D.C.: Office of the Deputy Chief of Staff Logistics, July 1997), 1.

²Michael D. Krause, "The Revolution in Military Logistics," Personal article, Alexandria, VA: Logistics Integratin Agency, 10 September 1996, 25.

³Department of Defense, Concept for Future Operations--Expanding Joint Vision 2010. (Washington, D.C.: Office of the Chairman of the Joint Chiefs of Staff, May 1997), I.

⁴Department of the Army, Army Vision 2010. (Washington, D.C.: Chief of Staff of the Army, 1996), 15.

⁵Department of the Army, "The Army After Next Project," Briefing by the Office of the Deputy Chief of Staff for Training and Doctrine Command, 1996.

⁶Steven F. Garrett, "Synchronizing Battlefield Logistics," Military Review (March-April 1997): 19.

⁷Leon E. Saloman, "The Technical Edge," Army, February 1995, 26.

⁸Ibid., 28.

⁹Robert M. Walker and John G. Coburn, "Preparing for the Revolution in Military Logistics (RML): The Way Ahead," briefing text. Office of the Deputy Chief of Staff for Logistics, December 1997, 1.

¹⁰Ibid.

¹¹Dennis J. Reimer, "Readiness Focus Group." Small group discussion with students at the U.S. Army War College, Carlisle, PA (Note: Comment made previously at briefings and logistics seminars), 25 February 1998.

¹²Henry Glisson, "Revolution in Military Logistics," Briefing for Executive Logistics Seminar by Director of Logistics Agency, 23 September 1996, 3.

¹³Walker and Coburn, RML briefing text, 2.

¹⁴Department of the Army, Army Vision 2010, 16.

¹⁵Walker and Coburn, RML briefing text, 5.

¹⁶Department of Army, Logistics Vision 2010 (Draft) (Washington, D.C.: Office of the Deputy Chief of Staff for Logistics, 14 August 1996), 3.

¹⁷Walker and Coburn, RML briefing text, 5.

¹⁸Gilbert F. Decker, United States Army Modernization, Fiscal Year 1997: Statement before the Subcommittee on Airland Forces, Committee on Armed Services, United States Senate, presented to the 104th Congress, 2d session. (Washington, D.C.: U.S. Department of the Army, 1996), 3.

¹⁹Ibid., 9.

²⁰Department of the Army, "The Revolution in Military Logistics," briefing by the Deputy Chief of Staff, Logistics, December 1997.

²¹Decker, Statement to Congress, 34.

²²Miltner, "M109 Family of Vehicles (FOV) Fleet Management Pilot Program," Information paper provided to the Office of the Chief of Staff for Logistics, Washington, D.C., 15 December 1997.

²³Stephen P. Ferris and David M Kiethly, "21st Century Logistics: Joint Ties that Bind," Parameters (Autumn 1997): 48.

²⁴Ibid., 49.

²⁵Joseph G. Nesbitt, "Divisional Combat Service Support Units in the Army XXI Environment," Strategy Research Project report, U.S. Army War College: Carlisle, PA, April 1990, iii.

²⁶Department of the Army, "Strategic Assessment 1996," (Washington, D.C.: Institute for National Strategic Studies, 1996), 185.

²⁷Krause, 22.

²⁸Walker and Coburn, RML Briefing text, 5.

²⁹Office of the Secretary of Defense, "Tactics and Technology for 21st Century Military Superiority," Volume 1: Final Report. Defense Science Board 1996 Study Task Force, 38.

³⁰Togo D. West, United States Army Posture Statement FY 96. (Washington, D.C.: Department of the Army, February 1995), 60.

³¹Scott W. Conrad, Moving the Force, Desert Storm and Beyond. (Washington, D.C.: National Defense University, December 1994), 28.

³²General Accounting Office, Desert Storm Transportation and Distribution of Equipment and Supplies in Southwest Asia. (Washington, D.C.: U.S. General Accounting Office, 1991), 7.

³³Walker and Coburn, RML briefing text, 7.

³⁴Ibid., 9.

³⁵Sandra Latsko, "Total Asset Visibility (H-8-99)," Information Paper provided to the Army Logistics Integration Agency (LIA), Alexandria, VA, 13 November 1997, 1.

³⁶Ibid.

³⁷Claudia Butler, "Army Total Asset Visibility (ATAV)," Information Paper provide to the Army Logistics Integration Agency (LIA), Alexandria, VA, 3 December 1997.

³⁸Decker, 29.

³⁹Dick Schaeffer, "Joint Reception, Staging, Onward Movement, and Integration (JRSOI)," Mobility Times. Vol 1, April 1996, 16-137.

⁴⁰Jeffery L. Flint, "Movement Tracking System (MTS)," Information Paper provided to the Combat Development Lab, FT Lee, VA, Dec 97.

⁴¹Gilbert G. Harper, "Urgency of Need Statement for the Procurement of Additional Movement Tracking Systems," Memorandum from the Chief of Transportation to the Assistant Secretary, Research, Development, and Acquisition. FT Lee, VA, December 1997.

⁴²Joel L. McGrady, "Movement Tracking System". Information Paper provided by the Chief, Combat Development Staff, FT Lee, VA, December 1997.

⁴³Edward J. Shimko, "Memorandum Report--2041 PLS-E Force XXI Combat Multiplier," Memorandum for Commander, U.S. Training and Doctrine Command, Ft Monroe, VA, December 1997.

⁴⁴McGrady, 1.

⁴⁵McGrady, briefing chart.

⁴⁶Walker and Coburn, RML briefing text, 5.

⁴⁷Ferris and Kiethly, 41.

⁴⁸Department of the Army, Logistics Vision for a Revolution In Military Logistics (RML) (Draft). (Washington, D.C.: Office of the Deputy Chief of Staff for Logistics, 13 November 1996), 12.

BIBLIOGRAPHY

- Butler, Claudia. "Army Total Asset Visibility (ATAV)." Information Paper. U.S. Army Logistics Integration Agency: Alexandria, VA, 3 December 1997.
- Conrad, Scott W. "Moving the Force, Desert Storm and Beyond." Washington, D.C.: National War College, December 1994.
- Coburn, John G. "Logistics Vision 2010 (Draft)." Washington, D.C.: U.S. Department of the Army, 14 August 1996.
- Decker, Gilbert F. United States Army Modernization, FY 97: Statement before Congress Subcommittee on Airland Forces, United States Senate, second session, 104th Congress. Washington, D.C.: Office of the CSA, 29 Mar 1996.
- Decker, Gilbert F. "Today's Readiness: Tomorrow's Readiness." Army. 46: (October 1995).
- Ferris, Stephen P. and David M. Kiethly. "21st Century Logistics: Joint Ties that Bind." Parameters. Autumn 1997.
- Flint, Jeffery L. "Movement Tracking System (MTS)." Information Paper. Combat Development Lab, FT Lee, VA, Dec 97.
- Garrett, Stephen F. "Logistics Staff Processes in the Information Age." Military Review 76 (July-August 1996).
- Garrett, Stephen F. "Synchronizing Battlefield Logistics." Military Review (March-April 1997).
- General Accounting Office. Desert Storm Transportation and Distribution of Equipment and Supplies in Southwest Asia. Washington, D.C.: U.S. General Accounting Office, 1991.
- Glisson, Henry. "Revolution in Military Logistics." Briefing: for Executive Logistics Seminar. Washington, D.C., 23 September 1996.
- Harper, Gilbert G. "Urgency of Need Statement for the Procurement of Additional Movement Tracking Systems." Memorandum from the Chief of Transportation to the Assistant Secretary, Research, Development, and Acquisition. Ft Lee, VA, December 1997.
- Hartzog, William W. "On the Road to Force XXI."
<<http://204.7.227.75:443/force21/jv/jv-essay/road/roadfxxi.html>>
- Hartzog, William W., and Susan Canedy. "Synergy for the Next Century: Force XXI to Army XXI." Army 46 (May 1996).

Kelly, Michael P. "CSSCS (Combat Service Support Control System)." Army Logistician (July-August 1995).

Krause D. Michael. "The Revolution in Military Logistics." Personal article for Logistics Integration Agency: Alexandria, VA, 10 September 1996.

Latsko, Sandra. "Total Asset Visibility." Information paper for Logistics Integration Agency: Alexandria, VA, 13 November 1997.

Lunasco, Dave K. The Ordnance Corps in the 21st Century: Prepared to Support the Force. Strategic Research Project. Carlisle, PA: U.S. Army War College, April 1996.

McDuffie, John M. "Force XXI Corps Support." Army Logistician (July-August 1995).

McGrady, Joel L. "Movement Tracking System." Information paper by Chief, Combat Development Staff, FT Lee, VA, December 1997.

Miltner. "M109 Family of Vehicles (FOV) Fleet Management Pilot Program." Information paper for Office of the Chief of Staff for Logistics, 15 December 1997.

Monroe, James W. "Ordnance Vision XXI--Force XXI Enabler." Army Logistician (November-December 1995).

Naylor, Sean D. "Digital Revolution Shows Promise but Needs Proof: Spring Experiments Will Test Prowess of Communications." Army Times 57 (13 January 1997).

Naylor, Sean D. "Digitized Brigade Struts Its Stuff in First Action." Army Times 57 (13 January 1997).

Nesbitt, Joseph G. "Divisional Combat Service Support Units in the Army XXI Environment." Strategy Research Project. Carlisle, PA: U.S. Army War College, April 1997.

Office of the Secretary of Defense. "Tactics and Technology for 21st Century Military Superiority." Volume 1: Final Report. Washington, D.C.: Defense Science Board 1996 Study Task Force.

Reimer, Dennis J. Army Vision 2010. Washington, D.C.: U.S. Department of the Army, 1996.

Reimer, Dennis J. "Readiness Focus Group," small group discussion with students at the U.S. Army War College, (Note: Comment made previously at briefings and logistics seminars), 25 February 1998.

Salomon, Leon E. "Providing the Technical Edge." Army 45 (February 1995).

Salomon, Leon E. "Transforming Logistics for the 21st Century." Army Logistician (July-August 1995).

Seffers, George I. "Experiment: Two Revolutions in One: Advanced Warfighting Test Exhibits New Technologies, Acquisition Methods." Army Times 57 (7 April 1997).

Schaeffer, Dick. "Joint Reception, Staging, Onward Movement, and Integration (JRSOI)." Mobility Times. Vol 1, April 1996.

Steele, Dennis. "Countdown to the Next Century." Army 46 (November 1996).

Shimko, Edward J. "Memorandum Report--2041 PLS-E Force XXI Combat Multiplier." Memorandum for Commander, U.S. Training and Doctrine Command, FT Monroe, VA, December 1997.

U.S. Department of the Army. "The Army After Next Project." Briefing by the Office of the Deputy Chief of Staff for Training and Doctrine Command, 1996.

U.S. Department of the Army. Army Vision 2010. Vision Statement. Washington, D.C.: U.S. Department of the Army, undated.

U.S. Department of the Army. Logistics Vision 2010 (Draft): Washington D.C.: Office of the Deputy Chief of Staff for Logistics, 14 August 1996.

U.S. Department of the Army. "Logistics Vision for a Revolution In Military Logistics (RML) (Draft)." Washington, D.C.: Office of the Deputy Chief of Staff for Logistics, 13 November 1996.

U.S. Department of the Army. Report of the Quadrennial Defense Review. Washington, D.C.: U.S. Department of the Army, FY 97.

U.S. Department of the Army. "The Revolution in Military Logistics." briefing by the Deputy Chief of Staff, Logistics. Briefing, December 1997.

U.S. Department of the Army. "Strategic Assessment 1996." Washington D. C: Institute for National Strategic Studies, 1996.

U.S. Department of the Army. The United States Army 1996 Modernization Plan. Washington, D.C.: Office of the Deputy Chief of Staff for Operations and Plans, 1996.

U.S. Department of Defense. Concept for Future Operations--
Expanding Joint Vision 2010. Washington, D.C.: Office of the
Chairman of the Joint Chiefs of Staff, May 1997.

Walker, Robert M. and John G. Coburn. Preparing for the Revolution
in Military Logistics: The Way Ahead, memorandum, Washington,
D.C., July 1997.

Walker, Robert M. and John G. Coburn. "Preparing for the
Revolution in Military Logistics: The Way Ahead." Briefing
text: Office of the Deputy Chief of Staff for Logistics,
December 1997.

"Weaponry, Equipment and New Technologies: The Army Modernization
Plan." Army 46 (October 1996).

West, Togo D., and Dennis J. Reimer. Meeting the Challenges of
Today, Tomorrow, and the 21st Century: A Statement on the
Posture of the United States Army, Fiscal Year 1997. Posture
Statement presented to the 104th Congress., 2d sess.
Washington, D.C.: U.S. Department of the Army, 1996.

West, Togo D. United States Army Posture Statement FY 96.
Washington, D.C.: U.S. Department of the Army, February 1995.

Wilson, Johnnie E. "Equipping and Sustaining America's Army
Today." Army 46 (October 1996).

Wilson, Johnnie E. "Forging the Army's Critical Logistics Link."
Army 45 (October 1995).

Wilson, Johnnie E. and Roberto Capote. "Leveraging Logistics
Technology Toward Forces XXI." Army Logistician (July-August
1995).