Focused Logistics and Support for Force Projection in Force XXI and Beyond

A Monograph
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ABSTRACT

Focused Logistics and Support for Force Projection in Force XXI and beyond. By Major Scott E. Rubitsky, USA, 49 pages.

This paper analyzes the combat service support concept of focused logistics in support of a Force Projection Army. The paper begins with an introduction to the differences between mass logistical practices of the past and the beginning and introduction of focused logistics. A brief explanation and introduction about focused logistics is given. This is followed by an explanation about why the United States Army has adopted this program. The focused logistics concept is then analyzed using the six tenets of the Revolution in Military Logistics, a seamless logistical system, distribution-based logistics, agile infrastructure, total asset visibility, rapid force projection, and an adequate logistical footprint, for their applicability to a Force Projection Army. Finally, the paper draws a conclusion about the viability and usefulness of focused logistics to the United States Army.

This paper argues that focused logistics will support a force projection army and that the savings realized will help lead the United States Army into the 21st Century.

CHAPTER 1: INTRODUCTION

> As I have said many times, there can be no revolution in military affairs (RMA) without first having a revolution in military logistics (RML). To provide the capabilities-based forces we need for the future, we must set the stage for transformation by changing the way we project and sustain those forces.[1]
>
> Dennis J. Reimer
> General (Ret.)
> Chief of Staff, United States Army

Section one. Background

For the last 120 years, the United States has had the best logistical system in the world. This is largely due to its ability to afford redundancy in its systems and well-developed rail, river, air, and sea lines of communication.[2] These lines of communication provided corridors for throughput of mass-produced weapons, vehicles, and sustainment.[3] "Mass Logistics reflected the robust production, transportation, and distribution capabilities of capitalist America."[4]

Mass logistics was the method used before the introduction and adoption of the current distribution-based logistics system. It was characterized by massive static inventories located in immense warehouses at each echelon of the force. These large stockpiles did not provide the mobility or flexibility required by Force XXI or the Army After Next. Because the system of mass logistics relies on large static inventories it is called a supply-based system and is often referred to as "just-in-case" logistics. In contrast, the distribution-based system is based on a transportation-based method and is referred to as "just-in-time" logistics. In other words, the distribution-based logistics system being implemented now substitutes an inventory in motion capability for the static practices of the past.

Since the Civil War, the industrial revolution has fueled the engines of America's war machine.[5] In the past, the use of mass logistics was acceptable because cost, time, and resources were abundant. The traditional American approach to warfare, of increasing mass to achieve battlefield lethality to inflict the maximum number of casualties while minimizing United States losses, was not without cost. "Nevertheless, mass logistics, though costly in material, was operationally effective and logistically feasible."[6]

Fiscal restraints, the end of the Cold War, and mandated inventory reductions set forth by Congress require the logistical community to reorganize and provide a more cost-effective capability. These costs have driven down the size of the force. Republican presidential candidate George W. Bush in a speech delivered on September 23, 1999 at the Citadel in Charleston, South Carolina said,

> The Gulf War was a stunning victory, but it took six months of planning and transport to summon our fleets and divisions and position them for battle. The military of the future must be agile, lethal, readily deployable and require a minimum of logistical support.[7]

If the United States Army is to be ready, relevant and responsive in the future, it has to reorganize and restructure to arrive faster with a greater sustained capability.

The reorganization and restructuring of time-tested principles, procedures, and systems will have a lasting impact and long-term effect on how the United States Army conducts future operations. In addition, the savings provided, by changing the way the United States Army conducts business, are important to the future of the Army because they are being earmarked to provide the necessary funds for force modernization. The reduction of the logistics footprint while providing adequate support to the operational commander, in a wide range of contingencies, will require

the military to adopt a new paradigm. This new paradigm will not come easily and its misunderstanding has helped fuel predictions of disaster for future military operations.

In the past, logistical sustainment has always played a pivotal role in determining the possibilities of war. This will not change in the future. "Historically, the United States has displayed a unique ability to project combat power at the strategic and operational levels of war."[8] Because the United States has evolved from a forward-deployed force to a Force Projection Army, logistics and the ability to provide sustainment to the force has become even more important for the United States Army. The projection of combat power in the United States has always been a function of its ability for mass production, transportation, and distribution.[9] There is a fear that the development of a new untested logistics system will not provide the margin of error afforded by mass logistics. The leveraging of new technologies to provide new capabilities and concepts for projection and sustainment of the United States Army is paramount to the success of the new system.

However, if the current system is too costly, and there is a need for a new system, what will the new requirement be? Major General Thomas W. Robinson, former commander of the Army Combined Arms Support Command (CASCOM), Fort Lee, Virginia and other individuals in the armed forces logistical community have focused their efforts on the six tenets articulated in the Revolution of Military Logistics. The six tenets include a seamless logistical system, distribution-based logistics, an agile infrastructure, total asset visibility, rapid force projection, and an adequate logistical footprint. These tenets span "the depth and breadth of military

logistics – from achieving an agile defense infrastructure to getting the right stuff at the right time to the soldier in the foxhole."[10]

> Joint Vision 2010 is the conceptual template for how America's Armed Forces will channel the vitality and innovation of our people and leverage technological opportunities to achieve new levels of effectiveness in joint warfare.[11]

Outlined in *Joint Vision 2010* are four operational concepts that describe how the United States military will conduct combat in the future. One of these concepts is focused logistics, often referred to as velocity management at the strategic level or battlefield distribution at the tactical level. As discussed before, a more popular term used to describe this concept and new capability is "just-in-time" logistics. Joint Vision 2010 defines this concept as 'the precise application of logistics'. "The concepts of "just-in-time" logistics and "precision sustainment" run counter to the redundant practices of the past."[12] However, to support the other operational concepts of Joint Vision 2010, focused logistics must provide responsive, flexible and precise logistics that are inadequately provided for by mass logistics.

On March 22, 1996, General Ronald H. Griffith, former Vice Chief of Staff of the Army, issued a message that directed the implementation of velocity management in the United States Army. General Griffith wrote,

> The goal is full spectrum support, from deployment to redeployment, reconstitution, or forward deployment, while at the same time enhancing both our combat effectiveness and the quality of life of our forces. The vision calls for improved support to the warfighter through the increased responsiveness, visibility, and accessibility of logistics resources.[13]

As stated earlier, Congress has mandated that the armed forces reduce their inventories to save money. The Defense Logistics Agency (DLA) has embarked on

an aggressive reengineering effort to improve support to the warfighter. Inventory reduction has saved civilian companies countless millions of dollars over the last ten years. This has led the Army to look at the benefits provided by adopting the model used by these civilian companies. The Defense Logistics Agency is attempting to "capture and adapt best-value commercial business practices and supercharge them by applying emerging technologies."[14]

Commercial best practices are "methodologies and applications used in private industry that set commercial enterprises above the competition."[15] These practices emerged due to increased competition, downsizing, and a hunger for profitability, or doing more with less.[16] Because the Army logistics community is constantly being asked to do more with less, commercial best practices have generated a great deal of interest as the United States Army modernizes its logistics capabilities.

Under the direction of Mr. Robert L. Molino, the Executive Director for Procurement, the Defense Logistics Agency (DLA) has won numerous awards for adapting best commercial business practices to all of its business systems. The awards include Harvard's 1995 Ford Foundation Award for Innovations in Government and the Vice President's Award for reinventing government. The Defense Logistics Agency (DLA) and Mr. Molino won these awards by pioneering such

> breakthrough strategies as leveraged group buying arrangements with commercial, electronically enabled distributors of brand name products such as pharmaceuticals and full service food items called prime vendors. He also implemented Quick Response, the electronic commerce business system linking trading partners with point of sale demand and real time manufacturing for clothing items.[17]

Quick Response achieved $1.7 million in cost savings for FY 1995 and it is estimated that the program will save customers an additional $79 million over the next five years.

One civilian company that has led the world in commercial best practices, inventory reduction, and "just-in-time" logistics is Volvo. However, there is a large difference between what Volvo does and what the United States Army does. J.S. Menendez, in an article called "Just-in-Time Operational Logistics, A Naval Warfighter's View," states that the "just-in-time" logistical "system is heavily dependent on timely and reliable transportation networks in order to be effective." The system was designed to work in the benign civilian market, not in a hostile combat environment.

For example, if Volvo does not receive a seat during the construction of a new S80, all that is lost is time and money. It does not have the same life-or-death effect, as does the failure of an infantry battalion to receive ammunition. Many of the operations the United States Army has conducted since the end of the Cold War have been in countries with underdeveloped infrastructure where reliable transportation systems are non-existent. This raises legitimate concerns that "just-in-time" logistics will not provide the full spectrum of support envisioned in Joint Vision 2010 because of its dependence on a developed transportation infrastructure. If the logistical community is to be successful, it must instill confidence in warfighters that critical supplies will arrive at the right place, in time, and in the proper amounts, in any environment.

The risk of losing soldiers' lives and the prestige of the United States as the world's sole remaining superpower will not allow for failure of the logistical system.

> Consequently, the transition from mass to precision logistics will require a fundamental shift in our approach to war. Precision logistics can be possible only if corresponding operational systems and functions embrace similar themes.[18]

Section two. Purpose

The purpose of this monograph is to answer the question; does "just-in-time" logistics support the requirements of a Force Projection Army? The six tenets of the Revolution in Military Logistics, a seamless logistical system, distribution-based logistics, agile infrastructure, total asset visibility, rapid force projection, and an adequate logistical footprint, will be studied for their applicability to a Force Projection Army.

Chapter one provided background on the mass logistical practices of the past and the beginning of the implementation of focused logistics. Chapter two explains the Focused Logistics program by studying the six tenets of the Revolution in Military Logistics. An explanation about each of the six tenets is provided. Following the description of the six tenets will be a study of where the United States Army has used Focused Logistical practices and what tenets have been applied to those various operations to achieve efficiencies not realized by mass logistics. Chapter three offers a conclusion about Focused Logistics and its applicability to Force XXI and the Army After Next.

CHAPTER 2: Just-in-time Logistics explained

The effectiveness of future military operations will be tied to the CSS capability to project, receive, and support the force.[19]

TRADOC Pam 525-5
Force XXI Operations
1 August 1994

Section one. Introduction

Velocity management is a new attempt for improving the Army Logistics System. It is focused on improving the speed and accuracy with which material and information flow through the system. This fundamental change is based on velocity and responsiveness rather than mass. Realizing that in order to be ready, relevant and responsive in the future to the nations needs, the United States Army has to reorganize and restructure to arrive faster to trouble spots with a greater sustained capability. "Its goal is to reengineer and improve support functions by establishing baselines, identifying sources of inefficiencies, setting goals for corrective actions taken, and measuring performance."[20]

Velocity management is the change that will help reduce the time needed to arrive and posture forces for success. It will do this by reducing the cycle times of the logistics process. The New Merriam-Webster Dictionary defines cycle as "a period of time occupied by a series of events that repeat themselves regularly and in the same order."[21] If velocity management is able to deliver the promise of a reduction in cycle times, this will then mean greater system responsiveness to the user's needs.[22] This reduction in cycle times will also permit a reduction in the size of stocks that have a tendency to choke the logistics system, because of poor information and wasteful requisition practices, while having very little benefit. For

example, Desert Storm was a resounding success, but not without a burdensome expense and some very unacceptable deficits in performance. In the future, the United States Army may not have the luxury of an adversary that will allow us to stockpile huge amounts of war materials in a well-developed port for six months.

Focused logistics looks to reduce the physical size and consumption rates for new systems that are being developed to support components of Army XXI and the Army After Next. They are also looking for materials that are lighter, stronger, and more reliable that will produce systems that are more powerful but consume less resources. This attacks the 'physics' of the problem by reducing the sheer weight of forces and the appetite for supplies.

Because the United States Army has evolved from a forward-deployed force to a Force Projection Army, logistics and the ability to provide sustainment to the force has become even more important for the United States Army. The development of these lighter, more reliable systems will in turn, require fewer systems. This will make it easier for the land-based systems to be deployed, at a lower cost and with greater speed. The ability to deploy forces faster and at a lower cost will help the United States Army become more strategically responsive.

The United States Army adopted the velocity management concept in January 1995. The concept was embraced after an assembly of senior Army Logisticians, led by the DSLOG, the Deputy Commander of the Army Material Command, and the Commanding General of the Combined Arms Support Command, convened at meeting at the Washington, D.C. offices of the Rand Corporation.

The Rand Corporation, through its military logistics researchers located at the Arroyo Center, developed the concept of Velocity management. They looked at many proven techniques used by other organizations and adapted them to the needs of the United States Army.[23] The vision that the scientists arrived at is truly revolutionary in that it "marries the power of information with the modern transportation and electronic commerce systems."[24]

To manage the new system the United States Army will evolve a seamless logistics system that ties all parts of the logistics community into one "network of shared situational awareness and unified action."[25] This will require organizations to evolve and mature. It will also require that new organizations will be created that are specific to managing distribution-based logistics.

General Eric K. Shinseki, Chief of Staff of the Army, in his vision statement on where the United States Army was going in the Twenty-first Century, summed up this new requirement when he said,

> We will aggressively reduce our logistics footprint and replenishment demand. This will require us to control the number of vehicles we deploy, leverage reach back capabilities, invest in a systems approach to the weapons and equipment we design, and revolutionize the manner in which we transport and sustain our people and material.[26]

Section two. Distribution-Based Logistics

Distribution-based logistics is recognized as a key to achieving the Revolution in Military Logistics. The system is more than just a velocity management and transportation based approach to supplying forces. It will require the logistics community and the warriors to revise the entire logistics sustainment

process. "It links the strategic, operational, and tactical levels of logistics to provide seamless distribution to the customer."[27]

Many modern civilian companies have adopted the idea of a value chain.[28] The idea of the value chain is important to the success of distribution-based logistics. It is not a new or revolutionary idea but it does reemphasize a focus on the customer throughout the business process. It requires all individuals in the value chain to ensure that the "customer has maximum satisfaction and return on his investment."[29] In the United States Army, the value chain would mean a "less bureaucratic logistics management approach."[30] It would support the end user throughout the process. Beginning with the operator, it would stretch through the direct support technicians, operational and theater logistics managers, and national-level logistics managers, eventually ending with the original equipment manufacturers. All these people would be linked digitally through the Global Command and Control System (GCCS) and the Global Combat Support System-Army (GCSS-Army) enabling them to interact to solve basic logistics problems.

The process of distribution-based logistics starts with "intensive, real-time readiness management."[31] With Army XXI, digitized information being downloaded from diagnostic sensors and prognostic systems embedded directly in unit equipment, readiness managers will be able to determine the real-time status and supply requirements of units. With "distributed logistics system software model hosts"[32] and active involvement in operational planning, readiness managers will better be able to support the warfighter. Shortfalls will be identified and corrected with logistics interventions before they become a detriment to the mission.

Packages of supplies and services specifically tailored to correct a readiness shortfall are called logistics interventions. It is assembled to fix a specific problem in a specific unit bringing parts, supplies, labor, special tools and equipment, and technical expertise. "The result is a specific improvement to the unit's readiness."[33] Because the logistics intervention is tailored as a package, it can be canceled as a package. This frees up assets and labor that can best be used somewhere else, enhancing the responsiveness of support.

The key to making the logistics intervention work is real-time distribution management. This is the "process of planning and coordinating the timely delivery of material, equipment, and personnel to and within an area of operations."[34] Distribution Management consists of three critical components: "visibility, capacity, and control, all of which require accurate, reliable, and up-to-date information."[35] Visibility of material as it flows from one node, in the distribution network to another node, will indicate if the logistics support is focused, responsive, and working.

Distribution managers will be called upon to track, expedite and redistribute thousands of logistics interventions. They will also coordinate a vast distribution network linking the commercial and military distribution systems. This distribution system will require the Defense Logistics Agency and U.S. Transportation Command in conjunction with civilian industry to integrate systems and standards.

> These include electronic commerce, electronic data interchange, automatic identification technology, materials-handling equipment, packaging, containers, and the interfaces within and between distribution platforms.[36]

Asset management will continue to be the function of the distribution-based logistics system that is closest to today's inventory management. The main

difference between today's system and the system of distribution-based logistics is that asset managers will be required to deal with virtual inventories as opposed to stocks of mass supplies. The capability to manage virtual inventories will require the capability of total asset visibility, another tenet of just-in-time logistics. A "way to shorten the logistical umbilical cord is to leave behind what you don't need."[37] Virtual inventories would help make that a reality by assuring the stocks are present or available somewhere else.

The asset manager will compare the total quantity of a particular item or resource against the forecast for that item, when it will be needed, what time it will be needed, and whether or not the item or resource is assigned. If the asset is available in a specific logistics intervention package, that package can be used to fix the problem. If the asset or resource needs to be acquired, the asset manager will have the capability of getting the needed support from the Defense Logistics Agency or industry sources. If the asset is available in the global distribution network, the asset manager will simply divert the required resource to meet the anticipated demand or requirement.

The distribution-based logistics system will be bi-directional in nature.[38] Not only will distribution managers be able to move support to units; they will also be able to move work to the support forces and contractors. Repairable items and systems can both be removed and replaced through the distribution-based system. "Revolution in Military Logistics logisticians can use focused distribution to create virtual logistics bases."[39] These virtual logistics bases will be "short-duration

rendezvous of labor, skills, tools, and material that use the best location to fix, package, reconfigure, and perform the logistics service required."[40]

Joint Vision 2010 is designed to help achieve a force that is designed as a decisive power projection force. The ability to achieve the decisive power projection force is a matter of being able to design a distribution network that is able to be projected into undeveloped, hostile, operational environments. The distribution-based logistics system must be able to keep-up with the maneuverable United States Army XXI forces once entry into an environment is achieved. It will also have to be maneuvered out of the reach of the enemies' long-range precision weapons in order to pass shipments between commercial and military carriers. "Such a dynamic distribution system promises revolutionary gains in agile, effective, logistics support to maneuver forces, while maintaining a relatively light footprint in the theater of operations."[41]

Subsonic aircraft requiring at least twenty four-hours to arrive anywhere in the world will perform the fastest intercontinental shipments to theaters of operation. If the material is not available and must be procured from commercial sources, the twenty four-hour time requirement may stretch to as much as seventy-two hours. That will require asset managers to anticipate the requirements of the warfighter. Because it will be difficult to know the specific requirements of a unit, the asset manager will have to predict the requirements in gross terms. Once the gross requirements are know, logistics managers can funnel specific requirements to specific units by assigning and redirecting bulk quantities of supplies on the fly. This ability will lead to a dynamic system that is able to react to the needs of the

operational commander, enhancing his ability to respond to unforeseen circumstances.

Section three. The Seamless Logistics System

An essential tenet of the Revolution in Military Logistics is the seamless logistics system. This concept envisions integrating the United States Army's logistics management framework, command and communications processes, and automation architecture into one seamlessly accessible system.

This system is to be transparent to both the users as well as to the supplier. Much thought and energy has gone into leveraging the best commercial business processes, infrastructure designs, and global information and electronic commerce technologies available. The system is broader than just transportation, supply and maintenance usually associated with logistics. It includes all integrated, transparent, interrelated activities that facilitate operations including

> design and development, acquisition, storage, distribution, maintenance, and disposition of material; movement and evacuation and hospitalization of personnel; acquisition or construction, maintenance operations, and disposition of facilities; and acquisition or furnishing of services.[42]

The concept of a seamless logistics system came about in the spring of 1998 when the United States Army's Deputy Chief of Staff for Logistics hosted a seminar attended by Chief-Executive-Officers and Vice Presidents from world-class logistics firms, active and retired senior military leader's and academic experts.[43]

Emerging from the seminar were two essential practices tied to discussions of best commercial practices. The two insights were that "information is critical to logistics, and logistics is a strategic asset."[44] Neither of these insights seem to be

earth shattering revelation, but because information is so essential to logistics, "the definition and description of a seamless logistics system take on the characteristics of a single, integrated information system."[45] This information system must be fully integrated and connected into all organizations by an "enterprise-wide, end-to-end information system"[46] that "can be achieved only in an environment dominated by global, wireless, assured communications."[47] This is the most crucial aspect of a seamless logistics system because without a fully integrated, enterprise-wide information system, all other functions in a seamless system would not be possible.

The seamless logistical system will be able to aid in planning and execution with real-time situational awareness. During planning, the concept of operation will be translated and processed directly into logistics terms meeting the requirements of the warfighter. The system will have the capability to anticipate losses, monitor supply consumption, and automatically regenerate supply requirements to a level required by operation tempo and battle requirements.

The integration of a seamless logistics system will have no merit if it does not focus on specific warfighter requirements that lead to an improvement in the ability to sustain movement, sustain the fight, and sustain combat power generation. These warfighter performance criteria must be quantitative and help optimize planning, execution schemes, and decision support.

The basic technologies of a seamless logistics system are available and in use by commercial industry today. If the United States Army is to be successful, it must invest and develop this technology as a whole. It can not be thought of as a separate system that will only support local and separate logistics functions. There

must be a fundamental change in the organization with a focus on the final customer.

Section four. Total Asset Visibility

Total Asset Visibility is another one of the six tenets of the Revolution in Military Logistics. It is also a Force XXI initiative designed to achieve total asset visibility with an automated capability to obtain information on the location, quantity, condition, and movement of assets. The system is designed to be fully automated, operate in near-real time with an open-architecture capability providing complete, integrated visibility over United States Army assets and data.[48] The Army Logistics Integration Agency, headquartered in Alexandria, Virginia, is the agency responsible for the development, management, and implementation of the Army Total Asset Visibility Program.[49]

A dedicated effort has been underway since Operation Desert Storm and Desert Shield to ensure that problems encountered during the build-up and execution of the war are not encountered in the future. Without a dedicated system for tracking and maintaining accurate records of the material flowing into the theater, soldiers, logisticians, and managers had to open and manually inventory thousands of shipping containers. They then had to reseal and reinsert the containers back into the logistics pipeline, wasting thousands of hours of manpower and untold numbers of dollars.

The Army Total Asset Visibility Program does not create any new logistics databases. It relies heavily on wholesale and retail information from the existing Standard Army Management Information Systems (STAMIS). The Army Material

Command Logistics Support Activity (LOGSA), located at Huntsville, Alabama, reconfigures and transfers the data received from the STAMIS to the Army Total Asset Visibility system, as it becomes available. Access to this data, through the Army Total Asset Visibility system, by a user, is transparent. It does not require the user to perform any additional tasks to view the source data.

> Some examples of these STAMIS include the Standard Army Retail Supply System (SARSS), Worldwide Ammunition Reporting System, Army War Reserve Deployment System, Standard Property Book System-Redesign, Commodity Command Standard System, AMC Installation Supply System, Standard Army Maintenance System-Installation/Table of Distribution and Allowance, Material Returns Data Base, and Logistics Intelligence File.[50]

Because Total Asset Visibility is dependent upon the information in the STAMIS, it is only as current as the information contained and entered in those systems. Because of this, the United States Army began a data integrity effort in fiscal year 1996. This has been an intensive program that has led to significant improvements, over the past couple of years, in the quality of information available.

The Army Total Asset Visibility capability has been implemented in most of the United States Army. It has been used successfully in Somalia, Rwanda, Haiti, and Bosnia. It has provided commanders with information and reports such as the authorized stockage list requisitioning objective dollar-value report and authorized stockage list zero balance report. Before deployment to Bosnia, Total Asset Visibility was used to identify and divert cold-weather clothing and equipment to forces scheduled to deploy.

The Army Total Asset Visibility capability could not work without automatic identification technologies (AIT's). These technologies and capabilities include

optical memory cards, bar coding, and radio frequency tags and readers. Each of these technological systems help "provide rapid and accurate data capture, retrieval, and transmission"[51] of information vital to the success of logistics visibility.

Radio frequency tags are used to identify the contents of trucks, seavans, and air pallets and their locations. They are read automatically when queried by radio interrogators tags located at air and sea ports of embarkation and debarkation, at other transportation nodes and choke points, and at receiving activities.[52] The information is then sent via satellite or other communications to a central server where the information can be accessed.

A major element of the Total Asset Visibility program is intransit visibility. This provides the logistician the ability to know where a pallet of supplies is and what is on that pallet. This technology is being used at length in support of operations in Bosnia. As supplies arrive in Hungary and Bosnia at the supply support activities (SSA's), optical memory cards are scanned through a reader. This information is then downloaded into a system that allows the user to know exactly what supplies have arrived. This eliminates hours of manual processing time and along with the radio frequency tags and interrogators have saved untold man-hours in Hungary, Croatia, and Bosnia.

As an example of how automated identification technologies will be incorporated into logistics operations all one needs to do is, look at how ammunition will be processed. The class V ammunition program will

> automate source data, integrate ammunition management information systems, create a baseline Army and joint automated identification technologies infrastructure and architecture, and provide asset and intransit visibility.[53]

The Army Logistics Integration Agency (LIA), Military Traffic Management Command (MTMC), Army Material Command, Army Combined Arms Support Command, United States Army Europe, and industry have taken the lead in using automated identification technologies in ammunition processing and handling. A test program was complete in fiscal year 1998 that allowed class V material, transported from the continental United States to ammunition supply points (ASP's) in Europe, to be tracked as it was processed through depots.

Before shipment, critical information will be added to the Standard Army Ammunition System-Modified to help receiving units and ammunition supply points plan for arrival of the ammunition. As a container is loaded with class V, radio frequency tags will be placed on the container, with specific information on the contents of that container. The tags will be used to track the container as it is shipped through various transportation nodes. This will allow for visibility on the container at both the shipping point and the receiving ammunition supply point.

The essential enablers for Total Asset Visibility have been implemented throughout Europe and Korea in the last two years. Army Forces Command (FORSCOM) is scheduled to finish their integration in fiscal year 1999. When merged with existing logistical systems Total Asset Visibility will enable the logistician to access data that is more timely and accurate allowing the movement of supplies in a more timely manner.

Section five. Adequate Logistics Footprint

An adequate logistics footprint is another important tenet of the Revolution in Military Logistics. It is defined as "a tread, a trace, an impression; a detectable,

targetable presence, representative of relative size."[54] It must be the right size to support both Force XXI and the Army After Next in a wide range of contingencies. An adequate logistics footprint is one essential tenet that will lead to a reduction in the mass logistics practices of the past.

In the future the large, redundant supply-based footprint will become one that is smaller and more efficient. Replacing mass logistics practices will lead to the elimination of huge inventory stockpiles. Split-based logistical operations will also help reduce the footprint in the theater of operations. It also reduces force protection requirements and consumption of supplies by logistics units. This in turn will reduce the amount of materials required by an operational commander.

"Product improvements and block material replacements will change the way the Army develops, tests, acquires, and maintains equipment."[55] "Smart simple design, a commercial industry best practice, has reduced the costs, assembly and manufacture cycle times, and number of parts in commercial systems."[56] Smart simple design must be incorporated into weapon systems and major end items in the future so that fewer parts are required to maintain these items. This in turn will require fewer parts in the inventory and maintenance personnel to repair these items.

For example, the

> M1A1 tank has thirty-odd different subsystems that may be attached when the system is fully configured for combat or training. Each of these subsystems has its own End Item Code (EIC), different from the EIC for the tank.[57]

The systems and subsystems must be optimized to ensure personnel and equipment needed to maintain the future tank is minimized.

These improvements in weapons and their effects for Force XXI and the Army After Next will change the operational and tactical logistics requirements of the past. Resupply, maintenance, and other combat service support functions will be accomplished in new and innovative ways. These functions will be shifted to higher echelons in order to help reduce the logistics footprint in the tactical and operational theater.[58]

Other items of interest that will help lead to a reduced logistical footprint include robotics, unmanned vehicles, intelligent agents, diagnostics and prognostics, smart/brilliant munitions, real-time communications, and fuel and energy improvements.[59] Each of these improvements when taken alone would lead to vast improvements in the logistics footprint, but when taken in concert with each other the concepts will lead to astronomical improvements.

Robotics will help replace personnel in reconnaissance, material movement, and transport leading to the use of all types of unmanned vehicles. The reduction in the required number of personnel in theater will lead to a corresponding reduction in the requirement for food and water.

Vehicles will be able to diagnose themselves and order needed replacement parts and components. This will lead to improved repair times and help prevent the failure of critical systems during operations. The need for redundant systems and weapons that were needed in the past to ensure mission success will be reduced. This again will reduce the logistics footprint.

The two biggest requirements for logistics support are ammunition and fuel. Improvements in both these areas will pay the highest dividends and will lead to a

significant reduction in the logistics footprint. Smart munitions and lighter weapons systems that are more reliable will allow for kill rations to approach one-to-one. This will significantly reduce and lower the requirements to stock ammunition and lead to fewer weapons systems being needed to complete and assure mission accomplishment. With the requirement for fewer systems that are lighter there will be a corresponding reduction in the burden of fuel. The result of these improvements will be a reduction in logistics demand and weapons that are more lethal, helping to streamline the logistical requirements of the past. This in turn will lead to a revolution in the way logisticians have supported the force.

Section six. Achieving an Agile Defense Infrastructure

Joint Vision 2010, the Quadrennial Defense Review, the Defense Reform Initiative, and the National Defense Panel have all stated that the Department of Defense needs to adopt an infrastructure that is capable of adapting to the rapidly changing world. All these studies suggest that the Department of Defense is too ponderous, bureaucratic, and unaffordable and needs to change to be more robust, flexible, and cost-effective.

The reports are long and detailed but many themes can be found throughout them. The main theme in the reports can be summed up as a need for a smaller and more affordable infrastructure that provides options and flexibility to support the warfighters. This is to be accomplished with an infrastructure-reengineering dependent upon competitive sourcing and privatization strategies. The reports also state that due to the speed of technology turnover there is a need for logisticians to

be flexible in adjusting maintenance capabilities, supply inventories, personnel training, and other services.[60]

Infrastructure is defined as "installations, fabrications, and facilities – both civil and military – necessary for the conduct of war."[61] This definition as accepted by the military is close to the civilian context of the definition. It is inclusive of roads, bridges, airports, fortified emplacements, and other products that help the military.[62] The difference between the civilian understanding and military understanding of the word is that typically civilian infrastructure supports the community instead of war and the ability to make war.

Although the above definition is through, it has fallen by the wayside for one that is even more inclusive. The contemporary view is that infrastructure not only includes the above listed items but also includes; depots, shipyards, bases, base support, medical care, transportation, utilities, communications, the Defense agencies, national-level logistics organizations, joint and service headquarters, and the Office of the Secretary of Defense. This broadened definition is useful in providing "logistics support in peace and war and during mobilization."[63]

Therefore, if infrastructure include all the items useful to logisticians in support of peace and war, how do you make it more responsive? Civilian "doctrine" defines agility as "the competency that sustains world class performance over time ... and is built upon three key capabilities (1) relevancy, (2) accommodation, and (3) flexibility."[64] These three capabilities have many similarities with the Department of Defense definition of agility. Relevancy is described as "the ability to maintain focus on the changing needs of customers."[65] Accommodation is "the ability to respond to

unique customer requests,"[66] what Joint Vision 2010 calls support tailoring and flexibility is "the ability to adapt to unexpected circumstances."[67] Each of these three capabilities will help the United States logistics community to become leaner and more robust, and thereby more agile. "Unless the Army becomes more nimble, it will not be prepared to fight fast-paced wars."[68]

The current defensive infrastructure is a holdover from World War II and the Cold War. It was designed to maintain an industrial base and provide for manpower mobilization during a long protracted war. This has proven to be inappropriate and unwieldy for the short wars that the nation expects fight in the future. To become more agile, the structure and business practices of the past will have to change. To understand better where we need to go it is important to understand how we developed today's' systems.

World War II represented a change in the way the United States Army prepared for and engaged in combat. "The established doctrine before World War II was similar to that of World War I: "no prior commitment," and hence no requirement for great peacetime readiness for war."[69] This thinking led to the failure of four mobilization agencies before the bombing of Pearl Harbor by the Japanese in 1941.[70] It also led to a crash course by the United States Army on how to support an Army in the field.

In 1942, when it became clear that the War Department was unprepared for the undertaking of developing a national-level infrastructure to support the war effort, the department was reorganized. Emphasis was placed on centralized direction and decentralized operations. Increased importance was placed on the

use of civilian personnel and accepted business practices. Many of America's most influential business leaders served in the Army Services Forces, applying lessons learned in their civilian practices to the problems of supporting the United States Army in World War II.[71]

The industrial potential of the United States was used to create a logistics system that relied on stockpiling huge amounts of material and then backhauling the supplies that were either not used or not needed. At wars end, huge amounts of surplus were created due to the inefficiencies inherent in mass logistics practices. This practice proved to be effective but very costly.

In Korea in 1950, the forces sent to stem the tide of the North Koreans were stymied by a lack of logistics planning, organization, trained personnel, material, and supplies. Troops were sent to Korea to help develop a logistics infrastructure. There was also a hope that the Republic of Korea could provide support to the troops, but that idea was quickly abandoned.[72] World War II stockpiles provided the initial supplies used by the United States Army and individual services continued to provide logistics to their respective service. Most of the logistics services were located in Japan. Japanese workers performing a majority of the services required by the Eighth Army until the Army was prepared to relocate to Korea. Once the Eighth Army moved from Japan to Korea, logistics services had to be reestablished, wasting valuable time and resources.

In Vietnam, the United States Army overstructured its logistics support, providing for an Army that operated with support unequalled in the history of warfare. William H. Taylor III and Randy T. Fowler in their article "Achieving an Agile

Defense Infrastructure," in the January-February 1999 *Army Logistician*, quoted Robert McNamara, the Secretary of Defense during the Vietnam War, as saying,

> There is some merit to the question of whether the war is costing more per enemy killed than any war in history. We are using in Vietnam what we have more of than anything else – money – instead of that which we value so highly – lives.[73]

During the Persian Gulf War, it became apparent that the logistical practices of the past were neither cost effective or desirable. The United States shipped 680,000 tons of munitions to the Gulf War but ended up returning 420,000 tons.[74] This was unacceptable to everyone involved. The principles of war were then directly linked to the concepts of host nation and coalition support. Along with the use of the host nation infrastructure, these two concepts shortened the time required to build and project the required forces in the Persian Gulf. Although there was significant improvement in the execution of logistical support during the Gulf War, there was a realization that much more could be accomplished. The agility and streamlined procurement processes required in an austere environment demonstrated that significant returns could be gained by developing new concepts.

General Eric K. Shinseki's vision statement, issued on October 12, 1999 at the annual Association of the United States Army meeting in Washington D.C., "is a clear attempt by Army leaders to not only revitalize and reshape their service, but to give it an edge many observers feel it has lost in the interservice competition for roles and missions."[75] General Shinseki is attempting to change the United States Army to meet the needs of his customers, the people of the United States. He is also calling for a more agile infrastructure because he realizes that future peacetime

and wartime scenarios will require the United States Army to be able to change quickly in response to the development of new technologies and threats.

Civilian industry has bypassed the United States Army in the area of logistics support. They are more responsive, innovative, have more expertise, and have the ability to surge to meet customer demands. In a word, they are more agile. If the United States Army is to reduce costs and improve performance, the logisticians must improve the agility of the Department of Defense infrastructure.

Section seven. Rapid Force Projection

Rapid force projection is much more than the ability of the United States Army to get to the fight. It includes many critical logistics functions that enable the force to deploy. Wargames conducted in support of the Army After Next have established findings that point to mobility and speed of maneuver as being the two most important factors contributing to the success of the that battle force.[76]

> The Army After Next battle force will need to be extremely maneuverable, capable of deploying directly from the continental United States (CONUS) onto the battlefield, and capable of using terrain for advantage in tactical engagements.[77]

All three of these capabilities are critical to the success of the United States Army.

In the Army War College, Army After Next spring wargame, held in April 1998, players identified four critical logistics factors associated with rapid force projection. The four factors include, streamline and speed force closure, lighten the force, reduce fuel and energy consumption, and provide for soldier support.[78]

The ability to get forces into theater to support the operational plan, will be complicated in the Army After Next because the United States Army will still be using large numbers of Force XXI and legacy forces. These forces are inherently

harder to deploy and will continue to have large support requirements. The requirement for a large support base to supply these legacy forces goes against the principles outlined in Joint Vision 2010. However, the United States Army will not be able to afford the replacement of the entire force.

The Army After Next forces will be used at the tip of the spear, leaving the follow-on Force XXI forces to secure areas cleared by their more lethal brothers. The reliance on legacy, Force XXI, and Army After Next forces, will require that the United States Army retain deployment platforms to transport both types of forces. The Army After Next force will use the limited deployment platforms for tactical mobility, with the rest of the force competing to use those same platforms to mobilize and deploy. The precarious balancing act between when to deploy combat forces and support forces will only grow more difficult in the future.

Because the force will be competing for limited deployment platforms to transport it, it is very important to lighten the force of the Army After Next to make it more transportable. Strategic lift issues will require the reduction in not only individual weapons platforms but also the reduction of personnel and supplies in the support structure. "A lighter logistics burden must be designed into new systems from the start."[79]

Eighty percent of the United States Army transportation assets are dedicated to moving fuel and ammunition.[80] Efforts to reduce the reliance on these two commodities are essential. "Reduced fuel and energy consumption rates are critical."[81] Rapid, long-distance maneuver supported by a large sensor and communications network required by the Army After Next forces will be very energy

intensive. The reduction of weight in Army systems will extend performance and make them more energy efficient.

There is also an effort to make future systems "ultra-reliable." The effect of making weapons platforms less maintenance intensive will pay dividends two ways. First, there will be a requirement for less support personnel in theater to both repair items and move redundant equipment. Secondly, there will be a reduction for repair parts needed to fix broken equipment. This will help reduce lift needed to transport repair parts and help with reducing the logistical footprint of a unit.

Items usually not associated with rapid force projection are included in soldier support issues. "Items like mail, pay, and special holiday meals still will need to reach the soldiers regardless of how the Army After Next forces operate."[82] The design of the Army After Next will need to account for these special logistics items. There will also be a requirement for units to deal with casualties, both medical care and body retrieval, and enemy prisoners of war.

These future programs are to be instituted to control costs, lighten the weight of the force, and ultimately provide the means to project the force, from its bases in the continental United States to any hot spot in the world, rapidly and decisively. The United States Army will do this by developing new and advanced systems that will reduce the cost and logistics burden. However, there is a requirement to do the same with today's forces, as quickly as current technology will allow.

Programs like the Modernization Through Spares and the Operations and Support Cost Reduction system are leading the change. These two programs along

with others are reducing sustainment costs in new and existing equipment by replacing components and parts with superior ones as the old parts wear out.

Efforts to address the acquisition of systems currently in development and those planned for the force of the future have been undertaken. Program Managers are being told to take into account the total life-cycle costs of all future projects. They must be aware of not only the production costs, but also the costs of research and development, fielding, repairing, modernizing, and transportation. Logistics is among the many variables that figure prominently in the acquisition of new weapons platforms and the attempt to cut costs and weight.

The Horizontal Technology Integration (HTI) program is another program that is having an impact on current and future systems acquisition. This program attempts to integrate current off the shelf common technology into multiple platforms. The use of common components and subsystems can lead to savings in many areas.

> Those savings begin with a sharing of the "overhead" costs of development, rather than pursuing partially or wholly redundant separate development efforts on a given technology...The Army saves again by purchasing larger numbers of a given item, driving the item's price down.[83]

The single biggest savings coming from the use of common components and parts occurs after a system or weapons platform is fielded. The more that common parts are used to manage the sustainment phase of a program's life cycle, the fewer varieties of parts that need to be stocked, tracked, and managed. The requirement to stock, track, and manage fewer parts will increase the efficiencies of focused logistics by making it easier to move those parts needed to a theater.

This helps save dollars in a couple of different ways. First, the requirements for different software to run different systems and platforms will be lessened. Fewer software requirements make it easier to write the software and diagnose any problem encountered in systems due to failures of that software. Secondly, by using commonality of parts, the requirement to train different Military Occupation Specialties (MOS) in different maintenance procedures is cut dramatically. This increases the versatility of soldiers, making it easier to diagnose and repair a variety of systems and platforms.

To ensure that the United States Army is ready, relevant, and responsive, realistic goals must be set for reducing the weight of weapons platforms, systems, and their support tail. There must also be a reduction in the requirement for fuel and power consumption, and an increase in the reliability of parts and systems. These improvements will go a long way towards relieving problems faced in logistically supporting the United States Army.

Reduction of the weight of the United States Army can be accomplished in two ways. First, weapons systems should have a maximum weight limit. This reduction in weapons systems weight will help the Army After Next achieve the maneuverability envisioned in Joint Vision 2010. Secondly, there must be a corresponding reduction in the associated support that must be deployed.

The weight of ammunition and fuel must also be reduced. This will be accomplished with the introduction of new materials and multifunctional subsystems. The reduction of fuel consumption and the weight of current ammunition will greatly reduce the weight of the force. Realistic goals must be

established for a percentage of improvement in weapons platform's fuel efficiency with establishment of a maximum percentage for fuel as a component of that system. The reduction in fuel and ammunition weight will greatly improve the the ability of strategic lift to deploy the United States Army.

The requirements for the use of power in new Army After Next systems must be monitored. The Army After Next will depend upon a large number of sensors and receivers to accomplish its mission. This increase in the number of sensors and receivers will have a corresponding increase in the requirements for power to run those systems. Steps must be taken now to ensure there is a reduction in the prerequisites to power those sensors and receivers.

Finally, goals need to be set in systems and weapons platforms reliability. Ultra-reliability will lead to a corresponding reduction in the requirement for repair parts to fix systems. This will also reduce the amount of time that systems spend in maintenance, further reducing the need for a large number of mechanics.

Section eight. Where has just-in-time logistics been applied

Velocity management is the United States Army's effort to reengineer its combat service support. The six tenets described above are an effort to tailor and guide the velocity management effort. Velocity management and the distribution required by the system "requires a fundamental integration of material and movement management functions."[84] The next logical question then becomes, how do you measure the success of the United States Army's efforts?

The Army again turned to the RAND Corporation for its answer. The RAND Corporation recommended that the United States Army adopt four measurements to

gauge the success of the implementation of velocity management. The four measurements include availability and readiness of material; repair cycle time; costs; and order and ship time (OST).[85]

Originally, four process improvement teams (PIT's) were assigned to improve velocity management processes by first defining the process, then measuring it, and finally improving it by implementing lessons learned from the first two steps.

The four process improvement teams looked at the order and ship times, repair cycles, financial management, and stockage determination. These teams were not charged with coming up with a computer program or similar things to improve these areas, but instead they looked at how to improve the methodology of the process.

There is good evidence the process improvement teams are having an impact and that dramatic improvements in the performance of the Army's key logistics processes are possible, affordable, and achievable. "For instance, over the last three years, the Army has succeeded in achieving more than a 50% reduction in order and ship time for units in the continental United States ordering from wholesale supply sources."[86] Before the implementation of the velocity management initiative, order ship times in the continental United States, for off the shelf items averaged twenty-two days. This average has been reduced to 10.6 days. Some Army Forces Command units have enjoyed even greater success. For instance, "for active units at Fort Bragg, North Carolina, the median order ship time has declined from a baseline average of eighteen days to six days in September 1998."[87]

Initial efforts were focused on the continental United States. These efforts were quickly instituted in units outside the continental United States for the United States Army, Europe and Korea. Those units have enjoyed the same amount of success displayed by their continental United States brethren. While not as dramatic, there has still been a tangible improvement. For parts shipped by air to Europe, there has been a reduction in order ship times from an average of 23 days to 16.5 days. Korea has also enjoyed success with a decrease in the shipment time from an average of 26.3 days to 13.1 days.[88]

The improvement in order ship times means much more to the United States Army than just improvements in the time it takes to get a requested part. It also reduces the number of orders in the system and there is less of an incentive for troops to hoard parts because there is an increased confidence in the system. An improvement in the delivery times also means that local units need not keep as many spare parts on the shelves. This has a positive effect on the amount of money available to the units. This also saves the United States Army tens of millions of dollars on parts that sit idly on shelves.

The United State Army has also successfully used the Total Asset Visibility program and intransit visibility to track selected deployment and sustainment shipments to Haiti and Somalia. The logistics community was able to locate, account for, and process shipments and requisitions quicker and more accurately than at any time before. This resulted in huge savings in man-hours accounting for lost and misplaced equipment.

Joint Endeavor was used as a test-bed for the implementation of focused logistics. Many of the concepts developed for the use of velocity management were planned and executed in support of the mission to Bosnia. The logistical concept envisioned for the support of the mission entailed using the as of yet new and untried velocity management concepts for material distribution.[89] The deployment planning called for

> leveraging established logistics infrastructure in NATO's Central Region (Germany) to provide split-based operations and capabilities; and reducing the United States footprint in the former Yugoslavia to cut down on troop exposure in a hostile environment.[90]

The attempt to limit the footprint in the former Yugoslavia and the use of split-based operations are directly tied to two of the six tenets in the Revolution in Military Logistics.

The United States Army has also instituted a civilian augmentation program to provide "on-the-shelf capability to support military contingencies worldwide."[91] The program, known by the acronym LOGCAP, for Logistics civilian augmentation program, has the ability to support a force of 20,000 in five different support areas and two airports of debarkation. LOGCAP was used successfully in Haiti, Saudi Arabia, and Somalia. They also provided water production, storage, and distribution in Rwanda. This program provides for a smaller logistics footprint while still providing needed logistical support to the commander.

The use of focused logistics in support of the many and varied operations that the United States Army has been involved in over the last six years shows that the processes will work. It has also shown that the requirement for mass logistics practices of the past can be overcome with velocity and that troops will be better

supported not only in garrison but also while deployed in support of many varied contingency operations.

CHAPTER 3: Conclusion

> This plan documents the Army's Combat Service Support (CSS) materiel requirements to resolve current deficiencies and implement the long-term goals of Force XXI. These are the near, mid, and long term "enablers" required to achieve required operational capabilities, implement future concepts, and exploit technological opportunities. These initiatives overcome current deficiencies, facilitate goals of power projection, and anticipate the opportunities and challenges of the emerging Force XXI CSS concept of Battlespace Logistics.[92]
>
> Daniel G. Brown
> Major General
> CASCOM Commander

In May 1996 the Chairman of the Joint Chiefs of Staff, General John M. Shalikashvili released *Joint Vision 2010*. Focused Logistics was one of the four primary tenets of *Joint Vision 2010* designed to be the operational template for the evolution of the United States Armed Forces. *Joint Vision 2010* has a focus on increased precision and lethality using technology enablers.

> From a logistics perspective, the way we organize, equip, train, deploy, and sustain forces and equipment today will not meet the demands associated with supporting the battlefield operations envisioned in the Army After Next era.[93]

There will be a need to change doctrine, organizations, and training to meet the challenges of the next century. The Revolution in Military Logistics and the implementation of the programs associated with that revolution are leading that change for the logistician and the United States Army.

The United States Army has always depended on its ability to generate mass to defeat its enemies. To compensate for its lack of efficiency in its logistics systems, the United States Army stockpiled great quantities of material and equipment. This reliance on mass logistics resulted in ports of embarkation and

debarkation quickly becoming overwhelmed with supplies. The quantities and mass of supplies choked the logistician's ability to move and account for the items in the supply lines. For instance, "During Operations Desert Shield and Storm, 22,000 of the 40,000 containers shipped to Southwest Asia had to be opened when they arrived to determine their contents."[94] In order to support Army XXI and the Army After Next, the logistics pipeline must get smaller, lighter, and quicker with greater visibility throughout the process.

Many of the United States Armies initiatives have resulted from lessons learned in Desert Shield/Desert Storm and the succeeding deployments to Somalia, Bosnia, Rwanda, and in the conduct of civil military operations.[95]

> These experiences confirmed our need for unit modularity, "split-based" management of CSS operations; tracking of unit equipment and personnel during deployment; visibility of sustainment supplies; movement of equipment, supplies, and personnel; rapid and efficient materiel handing equipment; enhanced personnel services support; and adequate systems to feed, shelter, protect, and medically treat our soldiers.[96]

Technology continues to offer the United States Army the potential to do more with less. To address some of the immediate concerns generated by an unresponsive flow into and out-of theater and a lack of availability of requested support items the United States Army is leveraging current technological enablers. These technology enablers will allow the logistician to support the warfighter better allowing for accomplishment of the mission with the increased precision and lethality called for in Joint Vision 2010. This increase in the use of advanced technologies will result in a decrease cost in human, political, and monetary capital. "The future of Army logistics remains tied to its fundamental tenet – responsiveness

to the warfighter and to the national military strategy."[97] This tenet will continue to guide the logistician and will not change with the increased reliance on advanced technology.

In the future, information technologies will allow the logistician to predict equipment failure, to know where the parts and people are to fix it, and to fix it before it breaks. By leveraging these information technologies, logisticians will be able to provide the right support at the right time at the right place. This will allow the utilization of support assets more effectively in providing for the maneuver commander.

Logisticians will not rely on historical data but will have real-time, predictive information that will allow them to make intelligent decisions that support the operational commander and ultimately the warfighter. All this will be supported by a global communications network that will provide the information required, when it is required, to the right people, in order to make the required decisions. These communications systems will support broad applications at the strategic, operational, and tactical levels providing a single seamless logistics system that will support the deployment of the United States Force Projection Army.

The Revolution in Military Logistics helps the logistician keep pace with Force XXI and the Army After Next as the United States Army modernizes. Logistics results achieved by world-class, United States companies did not come overnight and comparable results for the United States Army will not come easily.

> They reengineered their processes, contracted out where it provided better performance at lower cost, applied information technology solutions, and overcame cultural opponents who insisted on business as usual.[98]

The United States Army must reorganize its logistics establishment to become

> capability-based, modular for flexibility, able to anticipate and predict logistics requirements sooner, have pipeline visibility, focus limited logistics resources at the point of need, and able to react faster than ever before.[99]

The United States Army is not attempting this reorganization without a strategy. The six tenets of the Revolution in Military Logistics frame how logistics will be structured and offer a guide to lead the logisticians through the conversion from mass to velocity logistics. General Johnnie E. Wilson, when Deputy Chief of Staff for Logistics, Department of the Army offered this definition of what velocity management is and what it will do for the United States Army.

> It merges logistics management functions and consolidates logistics operations to maximize throughput and ensure continuous, timely total-asset visibility and control of all units, personnel, and unit and sustainment material coming into and moving within an area of operations.[100]

Strategic mobility is an important part of Force XXI and the Army After Next. It will require lighter units that are more easily deployed and supported. The Army strategic mobility plan (ASMP) implements the congressionally mandated mobility requirement study and enhances the ability of the United States Army to project itself rapidly. "While focusing on the wartime movement of material, equipment, and personnel, this concept is applicable to distribution operations in all types of operations."[101] The Army strategic mobility plan (ASMP) supported the C17 aircraft program and nineteen large, medium speed, roll-on-roll-off (LMSR) ships to be built by fiscal year 2001. The plan also calls for the procurement of sixteen thousand

containers for strategic lift and storage and one thousand four hundred and forty three railcars.[102]

Third world countries that provide little infrastructure or contracting operations will require that support organizations are able to provide the necessary lift, support and sustainment to deploy the Army.

> Rapid force projection from the Continental United States (CONUS), extended lines of communication, and potential entry into logistically bare-based areas of operation require the Army development of a logistics system that is versatile, deployable, and expansible.[103]

The concept of split-based operations becomes essential in order to provide the robust, continuous logistics that will be required in the future.

Many of the new information systems mentioned earlier will give the logistician a common shared understanding of the logistics picture. The

> common, relevant picture of the battlefield coupled with the information provided by a fully integrated combat service support system will allow the Force XXI CSS commander to anticipate requirements and project support further than ever before.[104]

All of these systems give the CSS commander better and quicker synchronization of logistics, visibility of equipment, and quicker processing times of orders, allowing for an increase in responsiveness in logistical support.

"Implementing Battlefield Distribution across the army is a significant transition to attaining many of the "Force XXI characteristics" associated with the deployment of forces and the flow of material to sustain that force."[105] The hub and spoke distribution system associated with battlefield distribution provides a distribution manager at each node. This reduces the layers associated with the current system and provides asset visibility. Source data automation, improved

logistics automation software, hardware, and communications provide the asset visibility required by the distribution managers.

When fully implemented velocity management will offer these three things to the United States Army. First, it will improve the flow of material and supplies through the supply system while increasing the accuracy of delivered items ordered. Second, it will provide shorter processing times, velocity, for the large masses of supplies required in the past. Thirdly, it will improve the processes involved with logistics by overhauling the steps involved in the process itself.[106] These improvements will enhance strategic mobility and flexibility to the operational commander by providing lighter, more survivable forces.

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http://infoseek.go.com/?win=_search&sv=M6&lk=noframes&nh=10&ud9=IE5&qt=%22value+chain%22&oq=&url=http%3A//www.becrc.org/vci.htm&ti=BECRC+Value+Chain+Initiative+resource+site&top=

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