

DISTRIBUTION SYNERGY IN MULTI-NATIONAL DIVISION-BAGHDAD
DURING OPERATION IRAQI FREEDOM ROTATION 07-09

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ARTS AND SCIENCE
General Studies

by

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Fort Leavenworth, Kansas
2011

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REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>		
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1. REPORT DATE (DD-MM-YYYY) 10-06-2011		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) AUG 2010 – JUN 2011	
4. TITLE AND SUBTITLE Distribution Synergy in Multi-National Division-Baghdad during Operation Iraqi Freedom Rotation 07-09			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) Lieutenant Colonel Hielke Welling			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301			8. PERFORMING ORG REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The purpose of this study was to investigate how the 1st Sustainment Brigade (SB) reduced customer wait time (CWT) in Multi-National Division-Baghdad (MND-B) from October 2007 to January 2008. A secondary objective was to determine what affect initiatives from operational and strategic organizations also had on reducing customer wait time (CWT). The collective improvement in CWT totaled 54 percent. A comprehensive literature review of the Army's distribution and supply pipeline was conducted from the factory to the foxhole to obtain requisite background data. This was followed by a thorough analysis of unit after action and performance reports to provide essential quantitative data. A survey was administered to select logistics commanders and Support Operations Officers (SPO) that had intricate knowledge of operations during that time. Finally, several interviews were conducted to address questions that were not fully answered by the survey. The main conclusion is that innovations by the 1 SB, theater units, and strategic organizations reduced CWT by six, two, and four days, respectively, for a collective improvement of 12 days. One day is unaccounted for and could be attributed to a tactical unit innovation that was not investigated in the scope of this thesis.					
15. SUBJECT TERMS Customer wait time, distribution pipeline, supply chain management, Sustainment Brigade					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. PHONE NUMBER (include area code)
(U)	(U)	(U)	(U)	113	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std. Z39.18

MASTER OF MILITARY ART AND SCIENCE

THESIS APPROVAL PAGE

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

DISTRIBUTION SYNERGY IN MULTI-NATION DIVISION-BAGHDAD DURING OPERATION IRAQI FREEDOM ROTATION 07-09, by Lieutenant Colonel Hielke Welling, 113 pages.

The purpose of this study was to investigate how the 1st Sustainment Brigade (SB) reduced customer wait time (CWT) in Multi-National Division-Baghdad (MND-B) from October 2007 to January 2008. A secondary objective was to determine what affect initiatives from operational and strategic organizations also had on reducing customer wait time (CWT). The collective improvement in CWT totaled 54 percent. A comprehensive literature review of the Army's distribution and supply pipeline was conducted from the factory to the foxhole to obtain requisite background data. This was followed by a thorough analysis of unit after action and performance reports to provide essential quantitative data. A survey was administered to select logistics commanders and Support Operations Officers (SPO) that had intricate knowledge of operations during that time. Finally, several interviews were conducted to address questions that were not fully answered by the survey. The main conclusion is that innovations by the 1 SB, theater units, and strategic organizations reduced CWT by six, two, and four days, respectively, for a collective improvement of 12 days. One day is unaccounted for and could be attributed to a tactical unit innovation that was not investigated in the scope of this thesis.

ACKNOWLEDGMENTS

This thesis is the culmination of 20 years of tactical and sustainment experience highlighted by two combat tours in Iraq during Operation Iraqi Freedom-2 and 07-09. I had the privilege to serve with many professional officers, Non-Commissioned Officers, enlisted Soldiers, government employees, and contractors. All of whom contributed to my military accomplishments and my personal growth. My success is shared with them.

I would like to thank my committee members Dr. Thomas Ward, Mr. Timothy Civils, and Mr. Gerald Leonard to include CW4 Darren Lester for their constructive criticism, academic guidance, and constant inspiration to complete this thesis. I greatly appreciated their personal sacrifice in time and effort they contributed to this project.

Finally, I owe my incredible wife, Karan; my son, Scott; my daughter, Nicole; and my supportive family and friends my endless gratitude. They fully supported my undertaking this scholastic adventure, continually motivated me throughout the journey, and cheered me at the end.

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ACRONYMS

AMC	Army Materiel Command
APOD	Aerial Port of Debarkation
ASG	Area Support Group
BCT	Brigade Combat Team
BSB	Brigade Support Battalion
C2	Command and Control
CDC	Corps Distribution Center
CDDOC	U.S. Central Command Distribution Deployment Operations Center
CENTCOM	U.S. Central Command
CL IX	Class IX Repair Parts
CLP	Combat Logistics Patrol
CONUS	Continental United States
COP	Combat Outpost
CRSP	Consolidated Receiving and Shipping Point
CSSB	Combat Sustainment Support Battalion
CWT	Customer Wait Time
DDKS	Defense Distribution Depot Kuwait
DLA	Defense Logistics Agency
DOD	Department of Defense
DS	Direct Support
ESC	Expeditionary Support Command
FOB	Forward Operating Base
ILAP	Integrated Logistics Analysis Program

JDDOC	Joint Deployment Distribution Operations Center
KBR	Kellogg, Brown and Root
LOGSA	Logistics Support Activity
MHE	Material Handling Equipment
MNC-I	Multi-National Corps Iraq
MND-B	Multi-National Division-Baghdad
MND-C	Multi-National Division-Center
OE	Operational Environment
OIF	Operation Iraqi Freedom
R&A	Review and Analysis
RTCH	Rough Terrain Container Handlers
SB	Sustainment Brigade
SPO	Support Operations Officer
SSA	Supply Support Activity
TAC 2	Freight Shipping Address
TMR	Transportation Movement Release
TPE	Theater Provided Equipment
TSC	Theater Support Command
U.S.	United States
USTRANSCOM	United States Army Transportation Command
VBC	Victory Base Complex

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CHAPTER 1

INTRODUCTION

Background

This thesis will investigate how the 1st Sustainment Brigade (SB) reduced Multi-National Division-Baghdad (MND-B) Customer Wait Time (CWT) for Class IX Repair Parts (CL IX) between October 2007 and January 2008, during Operation Iraqi Freedom (OIF) rotation 07-09. The standard for overseas CWT is 15 days (see figure 1).

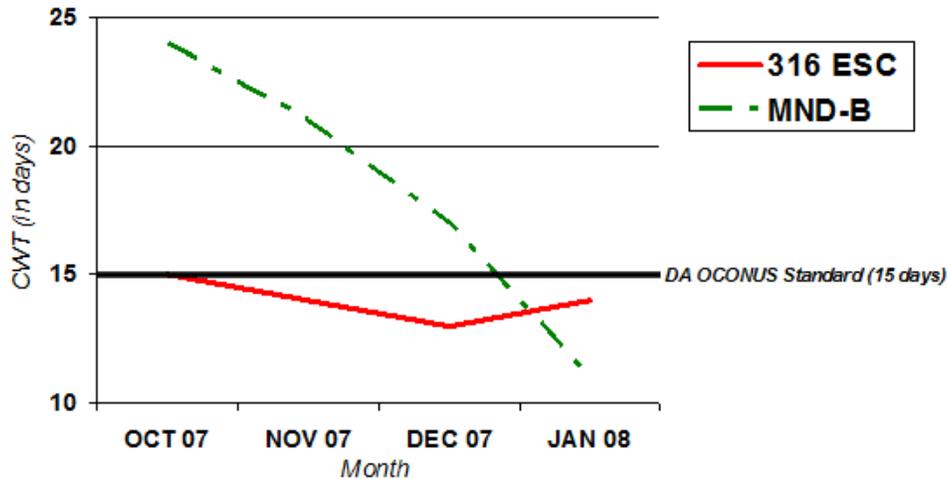


Figure 1. Average Customer Wait Time in Multi-National Division-Baghdad
Source: 1st SB, "Review and Analysis Brief" (PowerPoint slides, Camp Taji, Iraq, October 2008). Author created.

Another goal of this study was to determine how strategic enablers like the United States Army Transportation Command (USTRANSCOM), Defense Logistics Agency (DLA), the Army Materiel Command (AMC) and theater enablers, such as 1st Theater Support Command (TSC) and 316th Expeditionary Support Command (ESC) also

contributed to the reduction of CWT in MND-B during the same time. The total improvement was 54 percent, from 24 days to 11 days. This chapter provides an overview of the sustainment operations in place prior to and when the 1st SB assumed their mission in MND-B.

Sustainment Brigade Doctrine

Sustainment brigades perform functions previously done by corps and division support commands and area support groups. Their mission is to provide Command and Control (C2) of theater opening, distribution, and sustainment operations. Several factors such as Mission, Equipment, Terrain, Troops, Time and Civil determine the composition of functional and multifunctional subordinate battalions under its control. Distribution and supply management is focused on its Supply Support Activity (SSAs) and Consolidated Receiving and Shipping Point (CRSPs) in accordance with TSC plans, programs, policies, and directives.¹

15th Sustainment Brigade Review

The 15th SB deployed to Iraq in July 2006 during OIF rotation 06-08 to support MND-B which was headquartered by the 1st Cavalry Division. The 15th SB was assigned to the 13th Support Command. The brigade had C2 of three Combat Sustainment Support Battalions (CSSBs) and a Brigade Troops Battalion. Their mission was to provide direct support (DS) sustainment to MND-B and area support to Multi-National Division-Center (MND-C). The most prominent operation during their deployment was supporting “The Surge.”

The Surge Plan involved sending an additional 20,000 United States (U.S.) soldiers to Iraq to improve security in and around Baghdad. Five Brigade Combat Teams (BCT) arrived between January and June 2007. The Surge Strategy divided Baghdad into security zones which were closely aligned to its city districts. Each zone was supported by an Iraqi Brigade and a U.S. Battalion. The impact of the additional brigades was substantial.

By February 2007, the TSC and ESC executed a complete reorganization of Iraq's sustainment concept of support to facilitate the increased requirements in Baghdad. Distribution operations were vital to the success for reception and sustainment of the Surge Brigades. For that reason, the ESC augmented the 15th SB task organization with a palletized load system transportation company, two heavy equipment transportation platoons, an ammunition heavy-lift platoon, and material handling equipment (MHE). Additionally, the 15th SB received a Personnel Services and a Finance Battalion.

The 15th SB staff conducted weekly Operational Planning Groups and synchronization meetings, to resolve current sustainment issues and to forecast future requirements. Thus, the brigade effectively modified their concepts of support to meet a constantly changing environment. This planning technique was passed on to the 1st SB when they arrived to replace them.

1st Sustainment Brigade Operational Overview

The 1st SB conducted a mission rehearsal exercise at Fort Bragg in April 2007 and a pre-deployment site survey to Iraq in May 2007. At that time, sustainment operations were stretched to the limit in and around Baghdad to support the surge. Baghdad was clearly the main effort of coalition operations.

To understand the scope and magnitude of the operation, the following statistics will help visualize the battlefield. Baghdad is the third largest city in the Middle East consisting of 28.8 million people; it is 270,000 square miles in size. The city also had the second highest rate of improvised explosive device attacks in the country. Routes were through narrow or high traffic urban areas. Distribution operations consisted of local haul operations, less than 100 daily miles, to support over 100,000 coalition troops.

On 19 October 2007, the 1st SB conducted a relief-in-place/transfer-of-authority with the 15th SB. The MND-B was characterized as having an extremely high operational tempo. All surge BCTs were in place and offensive operations were expanding. Emplacement of thousands of concrete barriers had a strategic effect in neutralizing improvised explosive device threats and stabilizing the population by separating warring factions. Enemy activity continued against many Combat Logistics Patrol (CLPs). Logistics Civil Augmentation Program transportation assets had arrived but there were still significant issues in Baghdad, such as limited MHE and security platforms to escort CLPs.

The 1st SB mission was to provide DS logistics, human resources, and financial management to MND-B and area support to MND-C. The concept of support inherited from the 15th SB was effective but also very challenging and complex given the situation. The brigade's task organization consisted of the seven attached battalions (see figure 2).

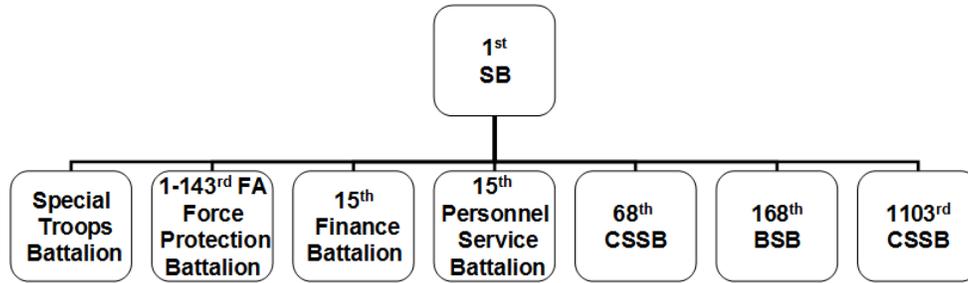


Figure 2. 1st Sustainment Brigade Task Organization, October 2007

Source: Colonel Kevin G. O’Connell, “1st SB” (RCAAT Brief Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009), slide 19. Author created.

This thesis will focus only on the three battalions that executed CL IX distribution and supply operations: the 1103rd CSSB located at Camp Taji; the 168th Brigade Support Battalion (BSB) located at Victory Base Complex (VBC); and the 68th CSSB also located at VBC. The 168th deployed as a BSB and was assigned to the 15th SB because it was in the ready available pool of units in the Army Force Generation process. The surge caused numerous resourcing issues such as manning and equipping; the 168th BSB was available to attach to MND-B.

The 1103rd CSSB was comprised of a headquarters company, two palletized load system transportation companies, one heavy truck company, one medium truck company, two convoy security companies, one maintenance company, one petroleum transportation company, one cargo transfer platoon, and one heavy equipment transportation platoon (OPCON). The 1103rd CSSB operated an SSA, CRSP, and heavy pad for rotary wing operations. Other sustainment missions were supporting three BCTs and an aviation brigade at Taji. One BCT at Forward Operating Base (FOB) Hammer, delivered concrete barriers in and around Baghdad, and performed external ESC missions.

The 168th BSB, operating as a CSSB, consisted of a headquarters company; one distribution company augmented with a medium truck company and a petroleum transportation platoon; one maintenance company; one palletized load system transportation company augmented with a heavy equipment transportation platoon; one convoy security company augmented with a convoy security platoon; one Kellogg, Brown and Root (KBR) transportation company augmented with a KBR petroleum transportation platoon; and one contracted Iraqi truck company. The 168th BSB operated an SSA. Other sustainment missions were supporting six BCTs located at Combat Outpost (COP) Shield, FOB Rustimayah, FOB Loyalty, FOB Falcon, the International Zone, and FOB Mahmudiyah. It also responded to 316th ESC missions.

The 68th CSSB was comprised of a headquarters company augmented with a heavy ammo platoon and a field services platoon; one cargo transfer company; one supply company augmented with a mortuary affairs team; and one maintenance company. The 68th CSSB operated an SSA, CRSP, and arrival/departure airfield control group at VBC. Other sustainment missions were supporting three BCTs and elements of five echelons above division brigades located on VBC, and backup support to either the 1103rd CSSB or the 168th BSB.

The primary units in MND-B were 1st Cavalry Division, 13 BCTs, and elements of five echelons above division brigades located at 11 FOBs, COPs, and Joint Security Stations (see figure 3). CL IX arrived by CLPs from Kuwait and by fixed-wing aircraft at Balad and Baghdad International Airport near VBC.

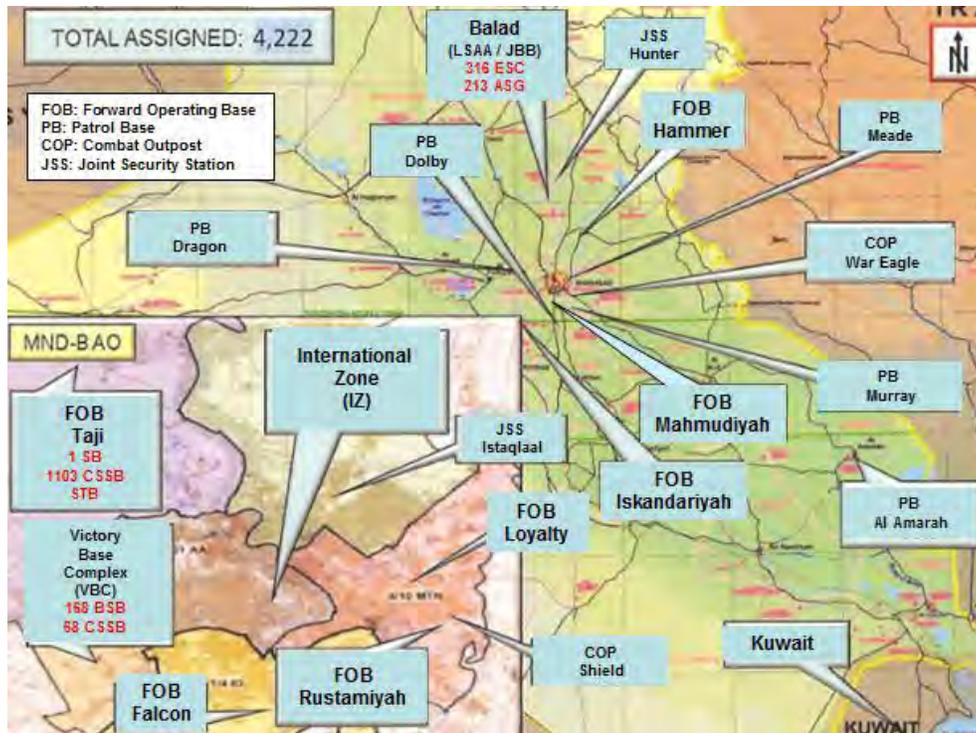


Figure 3. 1st Sustainment Brigade Operational Environment
Source: Colonel Kevin G. O’Connell, “1st SB” (RCAAT Brief Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009), slide 9. Author created.

Problem Statement

Determine how the average CWT in MND-B was reduced by 54 percent from October 2007 to January 2008.

Primary Research Question

What was responsible for the 54 percent reduction in CL IX CWT in MND-B from October 2007 to January 2008?

Secondary Research Questions

1. What actions did USTRANSCOM, DLA, and AMC implement to reduce CWT in the strategic segment of the logistics pipeline?

2. What actions did the U.S. Central Command Distribution Deployment Operations Center (CDDOC), 1st TSC, and 316th ESC implement to reduce CWT in the operational segment of the logistics pipeline?

Assumptions

1. Key documents available to review from 1st SB files and hard drives that contained OIF 07-09 deployment data provided accurate information.

2. Key documents available to review from 1st TSC and 316th ESC files and hard drives that contained OIF 07-09 deployment data provided accurate information.

3. Essential unit documents, briefing slides, performance reports, and maps could be declassified, if necessary, by the unit security officers.

4. Key sustainment personnel involved with supporting MND-B who participated in the survey provided responses that were accurate from their individual perspectives.

Limitations

1. Some documents stored on 1st TSC, 316th ESC, and 1st SB Secret Internet Protocol Router Network Sites were no longer available.

2. There was a lack of detailed studies and articles in open source literature that specifically examined MND-B distribution and supply operations from 2007 to 2008.

3. Some key unit commanders and support operations officers (SPOs) could not be located to conduct telephonic interviews.

Delimitations

This thesis did not address any tactical level innovations or problem solutions implemented by BSBs that may have reduced MND-B CWT. This was a deliberate decision to narrow the scope of the investigation.

Significance

This thesis serves as a historical case study of how the collective efforts of national and theater enablers and operational sustainment units achieved superior distribution synergy in MND-B during OIF 07-09. Also, it recommends distribution tactics, techniques, and procedures to be adopted as Army sustainment doctrine.

Definitions

Class IX Repair Parts. –Parts and components to include kits, assemblies, and subassemblies required for maintenance support of all equipment.”²

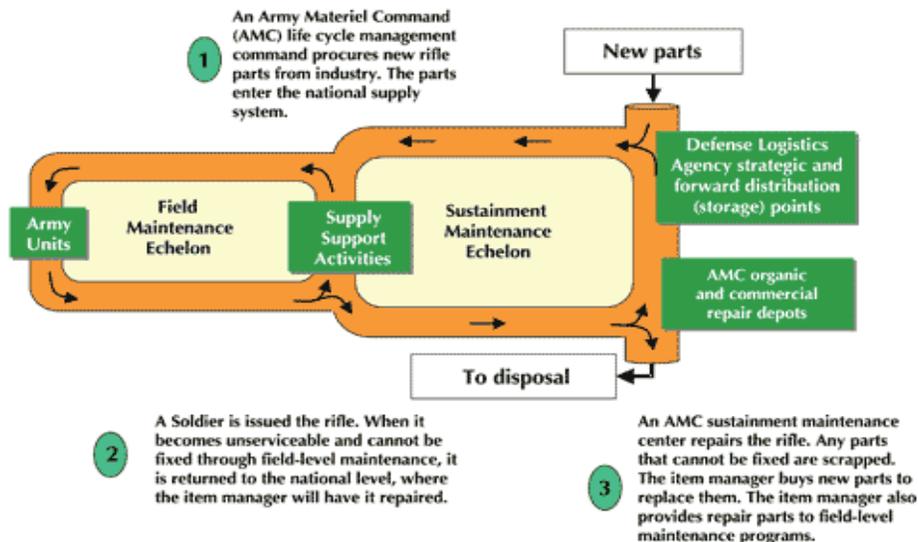


Figure 4. Army Materiel Command Life Cycle of Repair Parts

Source: John T. LaFalce, –AMC Repair Parts Supply Chain,” *Army Logistician* (May-June 2009): 3.

Class IX Requisition. Units first fill requisitions from organic supply stocks. If the item is not stocked or is at a zero balance, the requisition is passed to their supporting SSA. This unit will fill the request with their stocks or pass the requisition in the system.

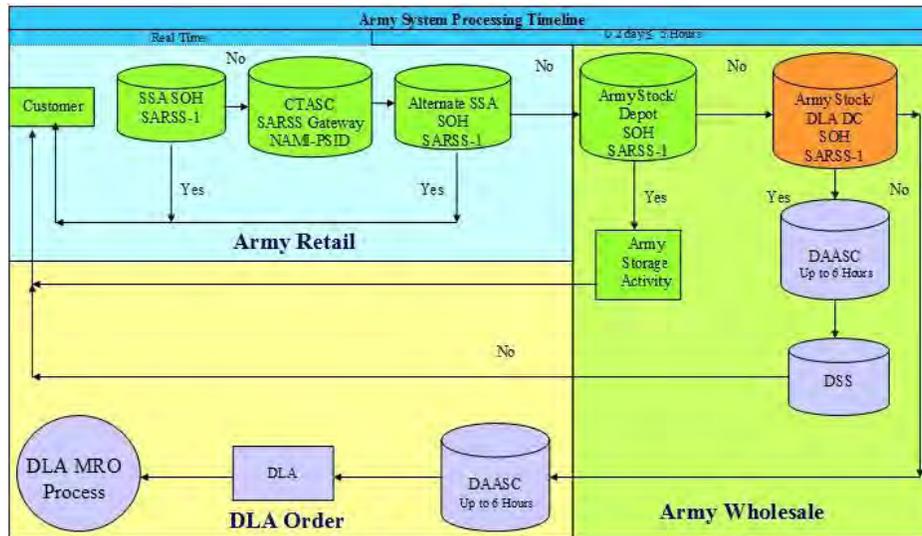


Figure 5. U.S. Army Requisition Flow

Source: Defense Logistics Agency, *Material Release Order Process Guide* (Washington, DC: Department of Defense Printing Office, May 2007), <http://www.dla.mil/j-4/cric/DeliveryServicesGuide.asp> (accessed 20 February 2011), 9.

Customer Wait Time. –The Army’s principle supply chain performance metric for measuring supply chain responsiveness that measures the time required to satisfy a supply request from the end user level, or total customer response time.”³

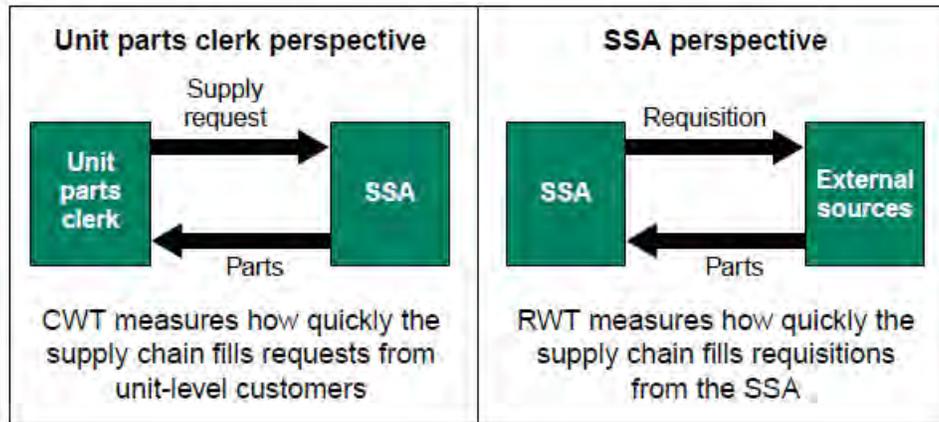


Figure 6. Customer Wait Time (CWT) and Requisition Wait Time (RWT)
 Source: RAND, *CWT and RWT Metrics Measure the Performance of the Army's Logistics Chain for Repair Parts* (Santa Monica, CA: RAND, 2003), http://www.rand.org/pubs/research_briefs/RB3035.html (accessed 16 January 2011), 2.

Distribution Management. –The broad range of activities concerned with effective and efficient movement of materiel from the source of supply to the point of use or consumption. DM activities include freight transportation, warehousing, materiel handling, packaging, inventory management, and management information systems.”⁴

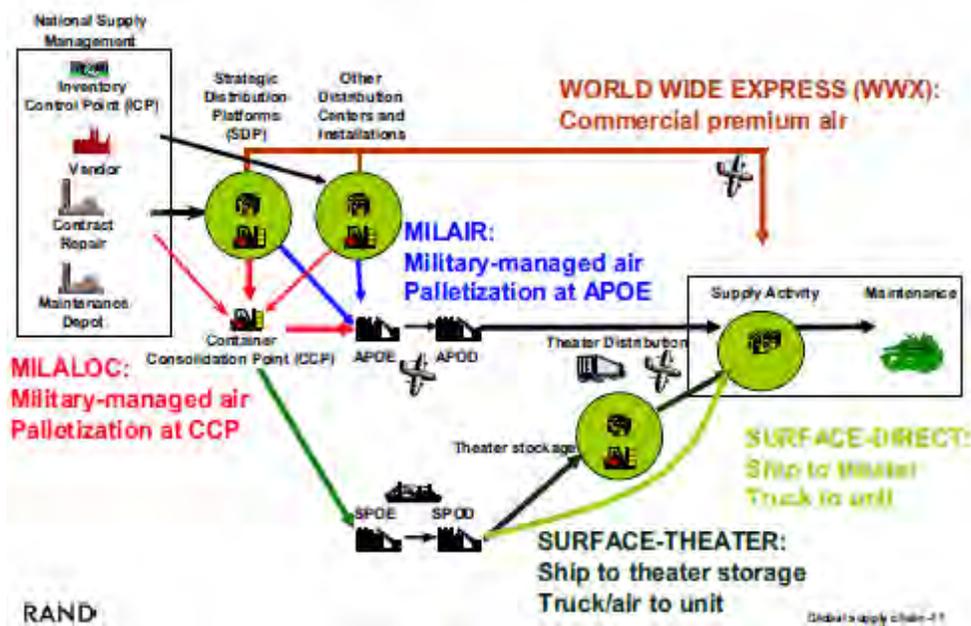


Figure 7. Five Major Distribution Channels for Overseas Sustainment
 Source: Eric Peltz and Marc Robbins, *Leveraging Complementary Distribution Channels for an Effective, Efficient Global Supply Chain* (Santa Monica, CA: RAND, 2007), http://www.rand.org/pubs/documented_briefings/2007/RAND_DB515.pdf (accessed 16 January 2011), 9.

Logistics. –The planning and executing the movement and support forces. It includes those aspects of military operations that deal with: design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; movement, evacuation, and hospitalization of personnel; acquisition or construction, maintenance, and disposition of facilities; and furnishing of services.”⁵

Logistics Pipeline. There are twelve segments for measuring the logistics pipeline. These segments are: requisition submission time, inventory control point processing time, pick, pack, ship, in transit to consolidation and containerization point time, consolidation and containerization processing time, in transit to port of embarkation time, port of

embarkation processing time, in transit to theater time, air port of debarkation processing time, in transit within theater time, and SSA receipt time.”

Category one is the fastest distribution for CL IX requisitions with a priority code of one through three. Category two and three have slower distribution for requisitions with a priority code of four through fifteen with required delivery dates of less than 21 days or more than 21 days, respectively.

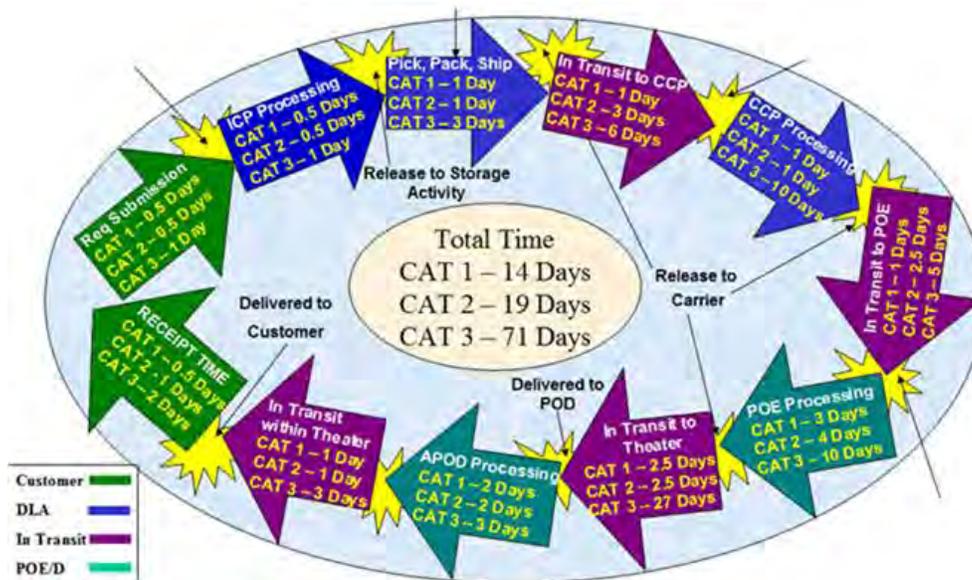


Figure 8. Logistics Pipeline for Southwest Asia (Area D)
 Source: Defense Logistics Agency, *Delivery Services Guide* (Washington, DC: Department of Defense Printing Office, May 2007), <http://www.dla.mil/j-4/cric/DeliveryServiceGuide.asp> (accessed 10 October 2010), 24.

Supply Chain Management. —The management of all internal and external logistics processes, information, and functions necessary to satisfy a customer’s requirement. The management of the interdependent logistics processes of customer

response, inventory planning and management, warehouse management, transportation, supply, maintenance, and reverse logistics.”⁶

¹Department of the Army, Field Manual Interim (FMI) 4-93.2, *The Sustainment Brigade* (Washington, DC: Government Printing Office, 2009).

²Department of the Army, Field Manual (FM) 4-0, *Sustainment* (Washington, DC: Government Printing Office, 2009), Appendix A.

³Department of the Army, Army Regulation (AR) 711-7, *Supply Chain Management* (Washington, DC: Government Printing Office, 2004), 17.

⁴Department of the Army, AR 711-7, 17.

⁵Department of the Army, FM 4-0, 1-4.

⁶Department of the Army, AR 711-7, 18.

CHAPTER 2
LITERATURE REVIEW

Introduction

This chapter is organized into two literary themes: strategic and operational. The overall approach for the review focused on analyzing the critical organizations, policies, doctrine, initiatives, After Action Reports, and performance data associated at each level. Research literature included sources from Department of Defense (DOD), Sister Service, Army, and professional logistics publications, to include their associated official websites.

The strategic review focused on national enablers such as the USTRANSCOM, DLA, and AMC. The operational review concentrated on theater enablers such as the CDDOC, 1st TSC and 316th ESC (see figure 9). This chapter also provides a mission overview for each strategic organization and operational command.

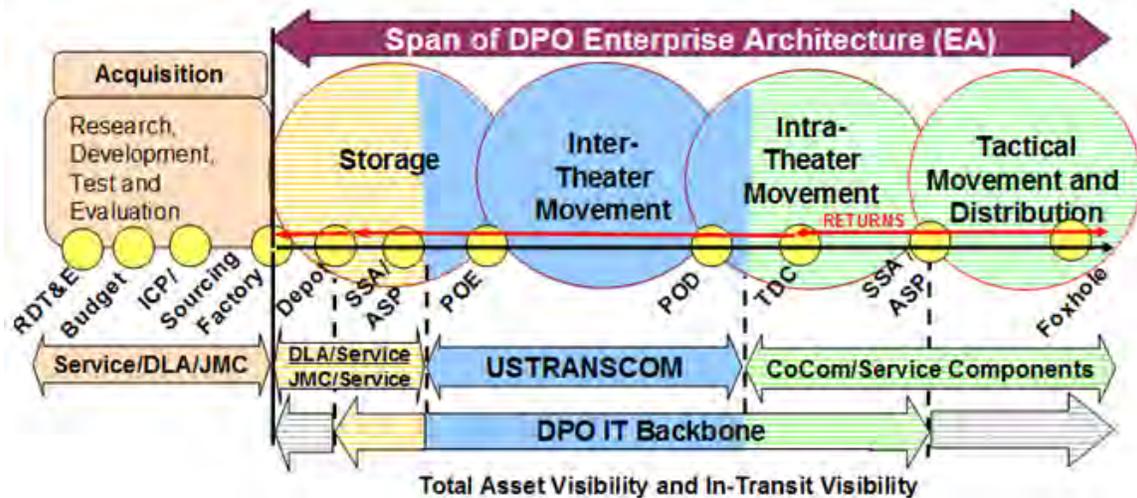


Figure 9. Distribution Process Owner (DPO) Span of Influence
 Source: United States Transportation Command, "DPO The Fundamentals Brief," 2010, http://www//transcom.mil/dpo_briefing (accessed 15 January 2011), slide 9,

Strategic Level Organizations

U.S. Army Transportation Command

The USTRANSCOM evolved over several decades starting from the creation of the Joint Deployment Agency at MacDill Air Force Base, Florida, in 1979 to improve global air, sea, and land transportation to meet U.S. security requirements. Following the Goldwater-Nichols Act, the Secretary of Defense created the Unified Transportation Command which was later renamed USTRANSCOM in 1987, see figure 10.

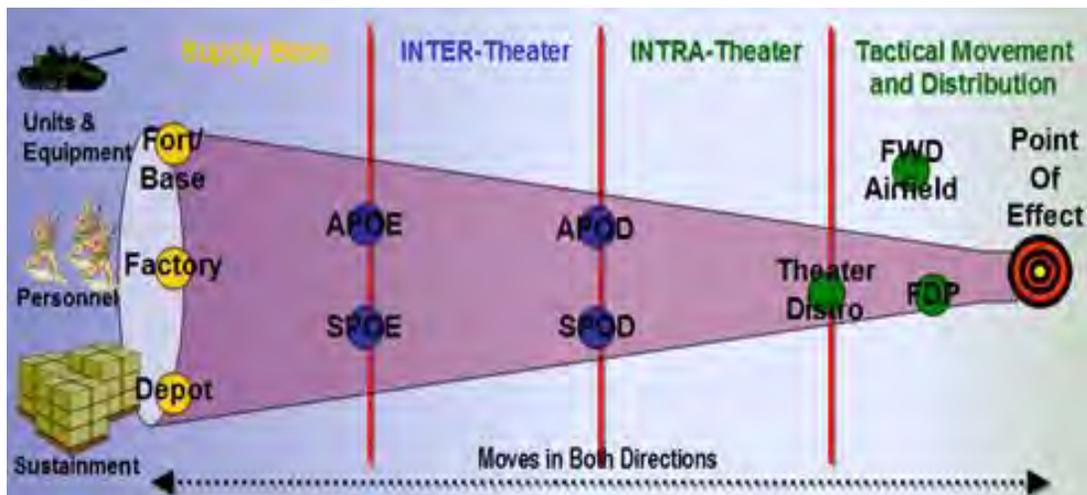


Figure 10. U.S. Transportation Command Span of Control

Source: United States Transportation Command, "DPO The Fundamentals Brief," 2010, http://www//transcom.mil/dpo_briefing (accessed 15 January 2011), Slide 17.

Today, USTRANSCOM conducts 1,900 air, 25 naval ship, and 10,000 ground missions daily in 75 percent of the world's countries. USTRANSCOM's mission is to provide DOD with air, land, and sea transportation through Service Component Commands such as the Air Mobility Command (AMC), Military Surface Deployment and Distribution Command, and Military Sealift Command.¹

The AMC mission is to move personnel and materiel from the aerial port of embarkation to the aerial port of debarkation (APOD) in theater. AMC also provides airlift, aerial refueling, and medical evacuation in support of military operations.

The Military Surface Deployment and Distribution Commands mission is to move equipment and supplies from the seaport of embarkation to the seaport of debarkation in theater. The Military Surface Deployment and Distribution Command also provides global surface deployment, containers, and railcars in support of military operations.

The Military Sealift Commands mission is to move materiel to sustain U.S. Forces. The Military Sealift Command also provides sealift and prepositioned ships loaded with materiel that are strategically placed around the world to support DLA and AMC missions to reduce CWT to U.S. Forces.

There are five major distribution methods for materiel to ship from CONUS to other theaters:

1. Military air with shipments consolidated at distribution centers (MILALOC)
2. Military air with shipments consolidated at airports (MILAIR)
3. Commercial express small package delivery or Worldwide Express (WWX)
4. Ocean lift theater inventory with theater distribution (Surface-theater)
5. Ocean lift transshipment to the unit (Surface-direct)

Basically, MILALOC is fast service at reasonable cost used for medium to high volume items. MILAIR is normal service at reasonable cost. WWX is very fast service limited to 150 pounds or less used for high priority items. Surface-theater is fast service at a reasonable cost used for high volume or high weight to cost items. Surface-direct is very slow service at low cost used for low cost, bulk, time-insensitive items.

USTRANSCOM implemented several new initiatives in 2007 that reduced the Army's overall CL IX CWT in early 2008. Platform management, introduced in February, established an automated Joint Intermodal Platform Management System to manage and track intermodal platforms like containers, pallets, and flat racks. In June, distribution data management was implemented to improve information visibility. The Defense Transportation Coordination Initiative was established in August to improve DOD CONUS freight. In November, USTRANSCOM created a single DOD port and manifesting system to facilitate the convergence of the Global Air Transportation Execution System and the Worldwide Port System into one system. This resulted in a single transportation tracking number to enhance the tracking capability in the DOD pipeline.² This was a significant improvement for CL IX management.

Moreover, two important DOD policies were implemented that directly affected USTRANSCOM operations. First, DOD Directive 5158.04, USTRANSCOM, dated July 2007 designated the USTRANSCOM as the Mobility Joint Force Provider, and the DOD Distribution Portfolio Management Manager for Sustainment and Force Movement.³ Second, DOD Instruction 5158.06, Distribution Process Owner, dated July 2007 tasked USTRANSCOM to oversee the overall effectiveness, efficiency, and alignment of DOD-wide distribution activities, including force projection, sustainment, and redeployment/retrograde operations.⁴

Finally, USTRANSCOM's initiative to establish the Deployment Distribution Operation Center in 2003 was key. Its mission was to function as a single point for combatant commands, Services, DLA, General Services Administration, and customers to interface with each theater's Joint Deployment Distribution Operations Center

(JDDOC). The creation of the Deployment Distribution Operation Center resulted in numerous initiatives that improved deployment processes, end to end distribution architecture, direct vendor delivery, radio frequency identification, supply and transportation priority system, and time definite delivery.

As a result, LTC Jeffrey Gulick, Chief of USTRANSCOM's Distribution Metrics and Analysis Branch stated: ~~we~~ also improved surface distribution performance to Kuwait by 38 percent from fiscal years 2006 through 2008.”⁵ USTRANSCOM and TSC work together to provide a seamless strategic and theater interface to provide efficient flow of supplies into theater and integrated operations throughout the distribution system. This is facilitated by the JDDOC. In the U.S. Central Command (CENTCOM) this organization is called CDDOC. The fundamental difference between a Deployment Distribution Operation Center and JDDOC is the Deployment Distribution Operation Center responds to direction from USTRANCOM whereas the JDDOC receives its guidance from the combatant commander.

Defense Logistics Agency

The DLA evolved over several decades. The post World War II environment required establishment of centralized and standardized management of common logistics and financial support in 1952. This subsequently led to the creation of the Defense Supply Agency in 1961. ~~For~~ the first time, all the military services bought, stored, and issued items using a common nomenclature.”⁶ DOD officially created DLA in 1977.

This new office consolidated Army, Navy, and Air Force service support into a Joint center. Today, DLA consists of over 27,000 military and civilian employees located in 48 states and 28 countries, it manages eight supply chains, five million items,

26 distribution depots, and processes 116,000 requisitions daily. The DLA mission is to provide supplies to our military services and support the acquisition of weapons repair parts and other materiel. DLA executes their mission through ten major field activities; distribution, energy, logistics information service, strategic materials, disposition services, land and maritime, troop support, aviation, transaction services, logistics management standards office and three forward theater command activities: Pacific, Central, and Europe and Africa.⁷

A review of DLA literature revealed 13 innovations in their 2007-2013 Strategic Plan to improve distribution, supply, and maintenance systems. The five innovations that contributed most to CWT reduction are Customer Relationship Management, Supplier Relationship Management, Business Systems Modernization, Distribution Planning and Management System, and National Inventory Management Strategy.

The Customer Relationship Management goals are customer retention, market expansion, reduced cost, and creating brand loyalty. –By implementing CRM, DLA will have a more systematic and focused approach to be better positioned to meet customer expectations.”⁸ This was achieved with improved supply policies, better customer service using a new process to resolve issues, and enhanced collaboration with suppliers to respond to customer needs.

The Supplier Relationship Management objectives are reduced delivery time, cost reduction, inventory savings, and improved buying power with suppliers. –This strategy is critical to DLA achieving the right item, at the right time, at the right place.”⁹ This was realized by implementing a qualitative scorecard between DLA and industry and developing supply chain alliances.

The Business Systems Modernizations' aims are enhanced demand and supply planning, procurement, order fulfillment, financial management, and reduced CWT. "The logistics response time for items managed with BSM has improved by 16 percent."¹⁰ This was attained by buying commercial off the shelf software to replace legacy systems.

The Distribution Planning and Management Systems' end states are optimized shipments using cross-docking, better shipment tracking, expedited movement using end-to-end documentation, and real time access for military customers. "DPMS supports DLA's commitment to fuse logistics and transportation information to improve CWT."¹¹ This was accomplished by using Commercial off the shelf software to improve supply coordination, tracking, positioning, and performance.

The National Inventory Management Strategy targets are better control and visibility of the entire supply chain, improved asset visibility with a single inventory manager, and reduced CWT through increased stock effectiveness. "Through NIMS, DLA will transform itself from a manager of supplies to a manager of complete supply chains."¹² This was done by integrating the legacy retail and wholesale supply systems into one national supply inventory.

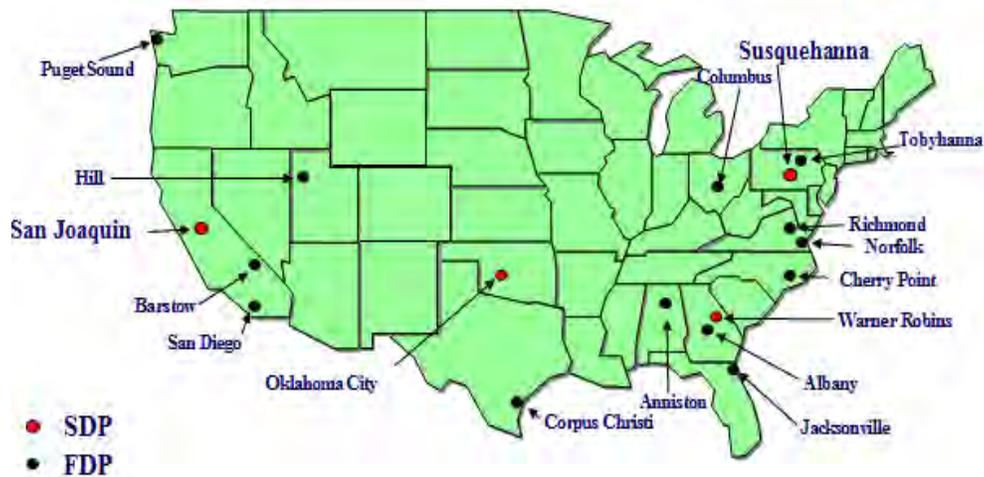


Figure 11. Defense Logistics Agency Forward Stocking Strategy
Source: Defense Logistics Agency, “DLA Supply Process Review Brief,” 9 April 2008, <http://www.dla.mil/j-6/dlmsa/archives/supply> (accessed 27 February 2011), slide 15.

The DLA also reconfigured supply, storage, and distribution operations and privatized commodity management. There are two Strategic Distribution Platforms located at Susquehanna, Pennsylvania and San Joaquin, California, (see figure 11); two Theater Distribution Platforms located in Yokosuka, Japan and Gernersheim, Germany; and four Forward Distribution Depots located in Hawaii, Italy, Guam, and Kuwait.¹³

Moreover, two important DOD policies were instituted that affected DLA operations. First, DOD Instruction 4140.06, CWT and Time Definite Delivery, dated December 2000, charged DLA to “use the customer wait time metric to assess the performance of the DOD supply chain, use the customer wait time measure and time definite delivery standard as the basis for process improvements.”¹⁴ Second, DOD Instruction 5158.06, Distribution Process Owner, dated July 2007, tasked DLA to “provide the DPO recommendations that will improve the ability of the DOD distribution

system to deliver sustainment to customers and coordinate with USTRANSCOM to ensure smooth and seamless supply chain operations.”¹⁵

Finally, initiatives taken by DLA's Defense Distribution Center had significant positive impacts to distribution and supply chain management. The Defense Distribution Center has 25 global sites that are responsible for the receipt, storage, issue, packing, and transportation of over 4 million items. One of these key sites is the Defense Distribution Depot Kuwait (DDKS) which was established in August 2004 by request from CENTCOM. The DDKS mission is to forward stock supplies and improve distribution and supply operations to U.S. Forces in Southwest Asia.

The establishment of DDKS allowed the DLA to better support the 1st TSC with improved planning, coordination, and execution of materiel moving in and out of theater. An example is the forward positioning of the DLA and General Services Administration managed items. Basically, DDKS optimized receipt, storage, and issue of theater supplies, streamlined consolidated shipping point and distribution operations, and enhanced materiel visibility. –As a result, DLA reduced CWT and improved theater logistics by reducing strategic lift requirements by four days during the end of 2007.”¹⁶

Army Materiel Command

The AMC was created in 1962 to establish a single Army Materiel and Logistics Command with direct links to the national sustainment base. This new organization consolidated the essential actions of developing, buying, and maintaining materiel for the Army. Today, this organization consists of over 70,000 military and civilian employees located in 50 states and 155 countries. The AMC's mission is to provide materiel

readiness, technology, acquisition support, materiel development, logistics power projection, and sustainment to the total force.¹⁷

A review of AMC literature revealed two important innovations in their business strategy to improve supply, distribution, and maintenance systems. These new programs are Single Army Logistics Enterprise and the Logistics Modernization Program.

The Single Army Logistics Enterprise will improve CL IX visibility, accountability, and interoperability by combining 18 existing supply, maintenance, and financial software and hardware systems into one. The result will be the Global Combat Support System-Army Field/Tactical. –SALE characterizes the Army logistics transformation vision to move from today's environment of disconnected information systems and business processes to a fully integrated environment that provides near real-time global visibility of equipment, supplies, and finances.”¹⁸

The Logistics Modernization Program will improve CL IX demand forecasts, order fulfillment, depot maintenance operations, information flow, and technology performance. The Logistics Modernization Program accomplished this by verifying on hand inventory, streamlining materiel requisitions, improving coordination with repair facilities, and enhancing Information Technology capabilities. –LMP will permit the planning, forecasting, and rapid order fulfillment that leads to streamlined supply lines, improved distribution, a reduced theater footprint.”¹⁹

The AMC executes their missions through four Life-Cycle Management Commands: aviation/missile, communication/electronic, joint munitions/lethality, and tank/automotive, (see figure 12). Four other commands: Army sustainment, Army contracting, Security assistance, and Research, Development and Engineering; and

Logistics Support Activity (LOGSA). This review will primarily focus on the Army Sustainment Command and LOGSA and their impact on reducing and managing CWT.

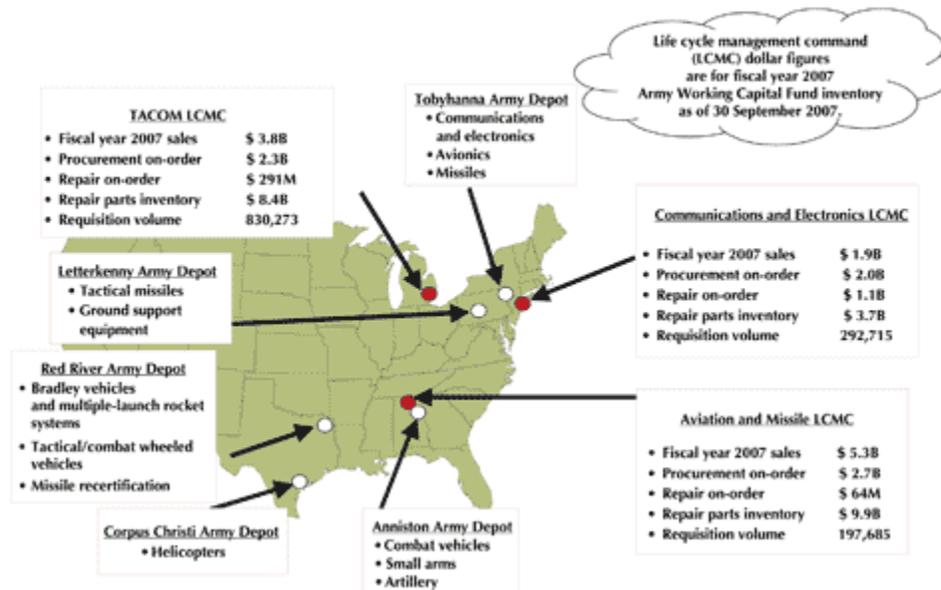


Figure 12. Army Materiel Command Repair Parts Supply Chain
 Source: John T. LaFalce, "AMC Repair Parts Supply Chain," *Army Logistician* (May-June 2009): 2.

Army Sustainment Command

The Army Sustainment Command is the keystone between the industrial supply base and the warfighter. It is responsible for integrating sustainment with joint and strategic partners to include supply and maintenance management and providing Army pre-positioned stocks.

Moreover, the Army Sustainment Command works with USTRANSCOM and DLA to integrate the national sustainment base into the Joint Deployment and Distribution Enterprise so that the national supply system effectively supports Army

Forces.²⁰ Finally, the Army Sustainment Command manages seven Army Field Support Brigades which are forward deployed and collocated with either a TSC or ESC to provide responsive sustainment support to theater units.

Logistics Support Activity

The LOGSA is the link between sustainment data and the warfighter. It is responsible for providing timely life cycle logistics information to support U.S. Forces so they can meet their full spectrum operational requirements. The LOGSA executes its mission through their Logistics Integrated Database and Integrated Logistics Analysis Program (ILAP) which are merged together in the Logistics Integrated Warehouse website.

The Logistics Integrated Database is the Army's central data bank for transportation and supply information. It provides visibility of individual requisitions and shipments as they proceed through the logistics pipeline and visibility of stock levels in the Army. The ILAP is a tool used by the Army managers to collect, integrate, and display supply, maintenance, and financial data. Both of these websites provided essential research data for CL IX CWT.²¹

Also, the LOGSA's parts tracker provides materiel managers with the status of CL IX requisitions in the supply pipeline and visibility of repair parts in the distribution pipeline. For example, Radio Frequency Identification tag information identifies the location of items moving through the Defense Transportation System.

Finally, the LOGSA's pipeline database provides materiel managers visibility of distribution and supply actions for CL IX requisitions in the system. This “pipeline” database provides a requisition status, shipping information, and a receipt status for repair

parts in almost real time. The database is also used for reporting Army distribution and CWT performance.

Operational Level Organizations

CENTCOM Deployment Distribution Center

The CDDOC was established in January 2004. Distribution had been a major challenge in Operation Enduring Freedom and OIF. Also, there was no single point of contact to address the various Joint processes in theater. As a result, the first JDDOC was created to fill the management gaps.

Basically, the CDDOC is a blended organization. It is built around the doctrinal Joint Movement Center, but a combination of USTRANSCOM, DLA, and AMC elements were added to enhance distribution and supply synergy in and out of theater.

The CDDOC is composed of six major branches which include sustainment requirements, air movement, surface movement, in-transit visibility, DLA, and Services. Its mission is ~~to~~ "synchronize and optimize strategic and theater multi-modal resources to maximize distribution, force movement, and sustainment logistics."²²

Since its inception, CDDOC has produced significant improvements in materiel distribution and visibility. The most substantial initiatives were improved management, creating pure pallets, implementing surface convoy to air conversion, and setting up a forward distribution depot, the DDKS.

First, improved management was achieved through comprehensive analysis of distribution and supply frequency, tonnage, CWT, and points of origin and destination. As a result, numerous CDDOC initiatives were implemented to improve performance. Second, creating pure pallets was accomplished by building unit pure CL IX pallets at

key depots and airports in CONUS. These pallets were then shipped by military air to Balad, Iraq or via commercial air to Ramstein, Germany with follow on military air to Balad. Consequently, this process maximized throughput of CL IX and reduced CWT. Third, setting up a forward distribution depot in Kuwait was critical to reducing CWT and inter-theater air mobility requirements. –DDKS stocked 7,800 NSNs in August 2004 with a goal of 40,000 by August 2005.”²³

Theater Support Command Doctrine

The TSC mission is to provide C2 for deployment, movement, sustainment, redeployment, reconstitution, and retrograde operations. The TSC uses ESCs, SBs, CSSBs, and modular units to execute its mission. Intra-theater distribution is primarily focused on personnel and materiel in accordance with combatant commander's plans, programs, policies, and directives.

Some key branches in the TSC's Distribution Management Center are:

Distribution Integration Branch which manages the Army theater distribution pipeline to include in-transit visibility of items.

Supply Branch which manages receiving, storing, and issuing of theater supplies to include CL IX; coordinates distribution management.

Materiel Readiness Branch manages materiel for various types of equipment, supervises maintenance operations, and advises commander on readiness.

Mobility Branch which manages theater movement to include containers, flat racks, and air pallets.

Log Automation Branch which manages automated identification technology and radio frequency in-transit visibility equipment.²⁴

1st Theater Support Command Operational Overview

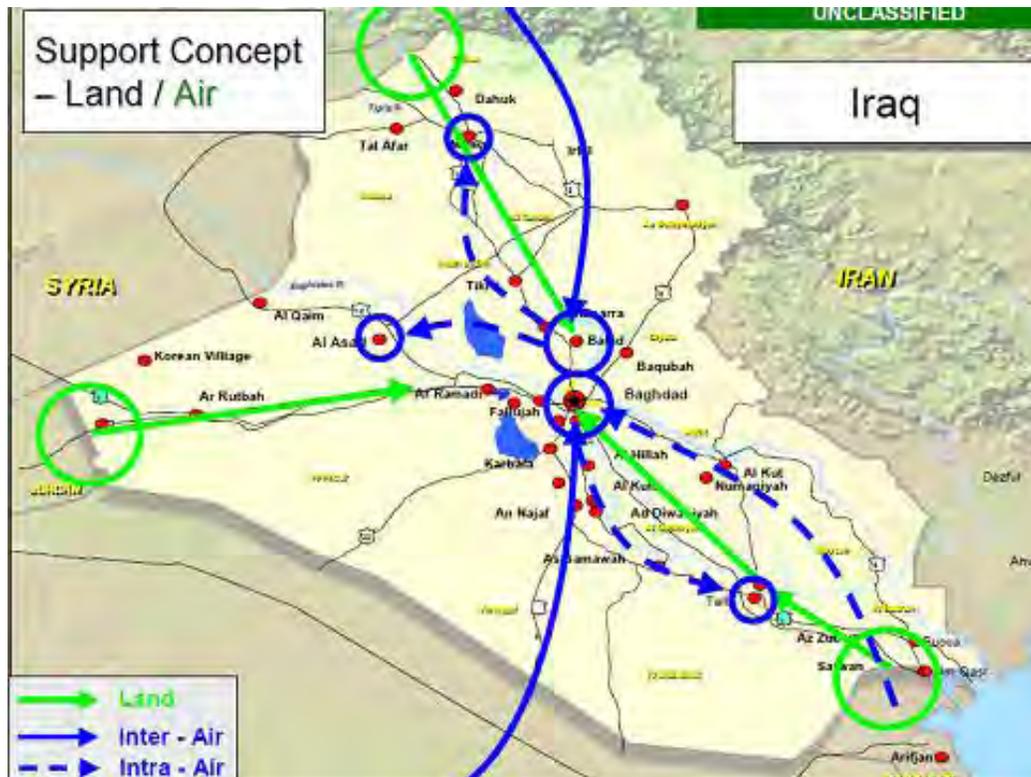


Figure 13. Theater Distribution Concept

Source: Brigadier General Gregory E. Couch, “316th ESC,” (RCAAT Brief Fort Lee, Virginia, U.S. Army Combined Arms Support Command, 15 October 2008), <http://www.cascom.army.mil> (accessed August 2010), slide 8.

Prior to the arrival of the 1st TSC, most theater support command organizations had a “rear area” focus whose only concern was specific sustainment metrics in Kuwait. The 1st TSC took a broader approach focusing on CENTCOM's entire Operational Environment (OE) to include being part of an end to end solution for improving theater sustainment metrics. Figure 13 depicts the 1st TSC land and air support concept for Iraq.

The 1st TSC implemented several initiatives to reduce the number of convoy turn times by monitoring metrics and determining the causes for unscheduled convoy remain overnights. These problems caused increase cargo wait time and were mitigated by prepositioning stand-by crews or replacement vehicles at convoy support centers.

The 1st TSC also started to monitor the backlog and age of containers in their theater holding yard which greatly improved distribution time for multi-class supplies to Iraq. Furthermore, the use of Umm Qasr as a port for non-sensitive cargo, such as Class IV barrier material, diverted bulk supplies from other areas resulting in a more streamlined process at other distribution and supply locations in theater.²⁵

The 1st TSC participated in a monthly USTRANSCOM distribution analysis meeting which identified some external trends that negatively impacted theater supply operations. Such as extremely high direct vendor and General Services Administration delivery times. Additionally, the 1st TSC continued to use RAND company analysis to keep SSA properly stocked and engaged the Defense Distribution Center on the theater distribution matrix. Previously, DLA published this matrix without theater input.

Finally, the 1st TSC created a one-year versus 6-month command for the 595th Transportation Terminal Group as a permanent Military Surface Deployment and Distribution Command Organization in Kuwait. The 595th co-located with the 1st TSC and proved to be an effective strategic partner in reducing CWT in theater.

Expeditionary Support Command Doctrine

The ESC mission is to execute sustainment, distribution, opening, reception, staging, and onward movement for Army Forces in theater. The ESC also provides C2 for SBs that provide direct or area sustainment to BCTs and functional brigades or battalions

that provide other logistics support, in their support area. The ESC coordinates with the TSC to establish logistics priorities and synchronize all distribution and supply operations. Like the TSC, the ESC has similar Distribution Management Center Branches to manage intra-theater air, land, and sea transportation assets to execute its missions.²⁶

316th Expeditionary Command Operational Overview

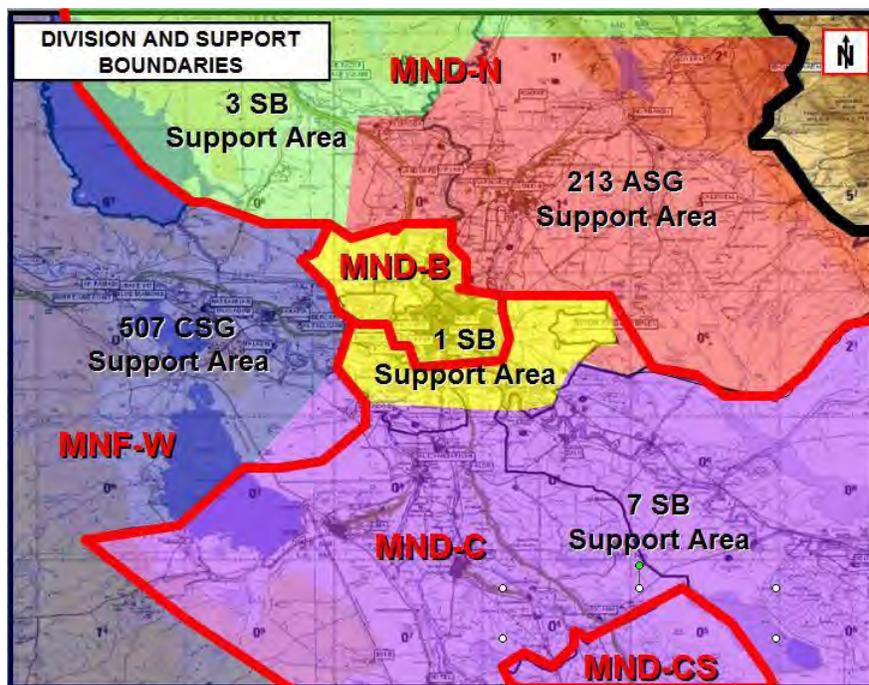


Figure 14. Division and Support Boundaries

Source: Brigadier General Gregory E. Couch, "316th ESC" (RCAAT Brief Fort Lee, Virginia, U.S. Army Combined Arms Support Command, 15 October 2008), <http://www.cascom.army.mil> (accessed August 2010), slide 9.

On 6 August 2007, the 316th ESC conducted their relief-in-place/transfer-of-authority with the 13th Corps Support Command. All Surge brigades 2/82 IBCT, 4/1 IBCT, 2/3 HBCT, 3/3 HBCT, and 4/2 STRYKER were in place and offensive

operations were just starting. There was increased enemy activity against their CLPs and Logistics Civil Augmentation Program transportation for the Surge had not yet arrived. Figure 14 depicts Multi-National Corps Iraq (MNC-I) division boundaries and the 316th ESC's support boundaries.

The 316th ESC task organization included five sustainment brigade equivalents: 3 SB in Multi-National Division-North located at FOB Q-West; the 213th Area Support Group (ASG) in General Support located at Logistical Support Area Anaconda; the 7th SB in MND-C located at FOB Adder; the 507th ASG in Multi-National Division-West located at FOB Al Asad; and the 15th SB in MND-B located at FOB Taji.

The 316th ESC mission was to provide seamless sustainment to MNC-I forces ensuring no operational pauses due to logistics shortfalls. The ESC mission had three main lines of operations: effective support to coalition lethal and non-lethal operations, setting conditions for U.S. force reduction, and transitioning Iraqi Security Forces units to assume independent operations.²⁷

The 316th ESC concept of support was complex and consisted of an air and land distribution system that replicated a ~~hub~~ "hub and spoke." To minimize the impact from enemy action on intra-theater sustainment flow, supplies arrived from three main locations. These supplies originated from Turkey in the North, from Kuwait in the East, and from Jordan in the West. This way Anti Iraqi Forces could no longer seriously disrupt the lines of communication as in April 2004. As a result of the Surge, CL IX referral and CRSP backlog increased by 30 and 50 percent, respectively, from August to November 2007.²⁸

Summary

In short, there were numerous innovations developed and implemented by the strategic enablers and theater commands just prior to and during 2007 that positively affected distribution and supply chain management. The end result of these innovations was a reduction in CWT across the entire distribution and supply pipeline. How much CWT was reduced in MND-B, by each organization or unit, will be fully analyzed in chapter 4, case studies and in chapter 5, assessments.

¹United States Transportation Command, “Inside USTRANSCOM,” <http://www.transcom.mil> (accessed 10 April 2011).

²United States Transportation Command, *USTRANSCOM 2007 Annual Report* (Scott AFB, IL: Government Printing Office, 2007).

³Department of Defense, Department of Defense Directive 5158.04, *United States Transportation Command* (USTRANSCOM) (Washington, DC: Department of Defense, July 2007), 4-5.

⁴Department of Defense, Department of Defense Instruction 5158.06, *Distribution Process Owner (DPO)* (Washington, DC: Department of Defense, July 2007), 4-5.

⁵Peter A. Buxbaum, *Government Agencies Partner to Streamline Warfighter Supply Operations*, <http://military-logistics-forum.com/mlf-archives/112-mlf-2009-volume-3-issue-4/1000-supply-chain-operations-reference.pdf> (accessed 17 September 2010), 4

⁶Defense Logistics Agency, “DLA Portal,” <http://www.dla.mil> (accessed 20 February 2011).

⁷Ibid.

⁸Defense Logistics Agency (DLA), *Transformation Roadmap* (Washington, DC: Department of Defense, July 2007), 6

⁹Ibid., 7.

¹⁰Ibid., 10.

¹¹Ibid., 11.

¹²Ibid., 14.

¹³Ibid., 15.

¹⁴DOD Instruction 4160.61, *Customer Wait Time and Time Definite Delivery*, December 2000, 3-4.

¹⁵DOD Instruction, 5158.06, *Distribution Process Owner*, July 2007, 3.

¹⁶Supply Chain Integration, CWT Tool Chart, <https://scitools.lmi.org> (accessed 20 November 2010).

¹⁷US Army Materiel Command, “AMC Portal,” <http://www.amc.army.mil> (accessed 10 April 2011).

¹⁸Department of the Army, *2009 Army Posture Statement* (Washington, DC: Department of the Army).

¹⁹*Army Logistician Magazine* (January 2007): 11.

²⁰Department of the Army, Field Manual (FM) 4-94, *Theater Sustainment Command* (Washington, DC: Government Printing Office, February 2010).

²¹Logistics Support Activity, “LOGSA Portal,” <https://www.logsa.army.mil> (accessed 10 April 2011).

²²CDDOC Brief, Arifjan, Kuwait, February 2005.

²³CDDOC 365-day Report, Arifjan, Kuwait, 1 December 2004, 17.

²⁴Department of the Army, FM 4-94.

²⁵1st TSC SPO Lessons Learned, 2011.

²⁶Department of the Army, FM 4-94.

²⁷Brigadier General Gregory E. Couch, “16th ESC” (RCAAT Brief, Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2008) <http://www.cascom.army.mil> (accessed August 2010), slide 7.

²⁸Ibid., slide 50.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter explains the research design used to analyze data gathered to address the problem statement and answer the primary and secondary research questions.

Additionally, this chapter describes the questions to be answered, the approach used, how data was collected, how data was analyzed, an assessment of research strengths and weaknesses, and a summary.

Questions to Answer

The thesis problem statement began with a professional desire to understand all the factors that contribute to reducing CWT. The statement evolved into one that focused on determining how CWT in MND-B was reduced by 54 percent. A reduction of CWT by half within four months was a significant accomplishment and deserved a more thorough investigation. Who was responsible, how was it done, and what was the result were some of the basic questions to be answered.

The approach to investigating this thesis was to identify the best way to answer the primary research question. What was responsible for the 54 percent reduction in CWT in MND-B from October 2007 to January 2008? The best way to answer that question was to use a case study format to set qualitative context, supplemented by quantitative data gathered through a survey questionnaire, to corroborate qualitative conclusions. A case study could better describe the situation, explain the complexities, illustrate the approach taken, and emphasize the results than other methods. The use of a survey and its

results could help substantiate initial research findings and strengthen overall thesis conclusions.

Approach Used

The case study method focused on defining the problem, developing the background, identifying the issues, explaining the solution, and describing the results. The survey focused on obtaining unbiased feedback from critical sustainment officers who were present during OIF 07-09. The survey results would confirm, prove nothing, or deny the significance of the 1st SBs, operational, and strategic innovations to reduce CWT in MND-B. The main benefit of the mixed method case study and survey questionnaire methodology was the ability to gather both quantitative and qualitative data.

First, in defining the problem, it was essential to select a problem statement that was both feasible to research and beneficial to the military sustainment community. A review of numerous Reverse Collection and Analysis Team reports from sustainment units during OIF 06-08 and 07-09 indicated there were significant lessons learned during The Surge. Moreover, it was the first time that a fully transformed sustainment structure was in place from the TSC in Kuwait to an ESC, SBs, CSSBs, and BSBs in Iraq. An examination of the 1st SB Reverse Collection and Analysis Team revealed several innovations that might have contributed to a substantial reduction in CWT, CRSP cargo transit time, and Transportation Movement Release (TMR) delivery time in their area.

Second, in developing the background, it was important to accurately portray the OE and current initiatives that existed at the strategic and operational level during the time. A review of DOD policies, national programs from strategic enablers, Joint

Publications, Army Regulations and Field Manuals, Army sustainment publications, unit concepts of support, Unit After Action Reports, and Unit Review and Analysis (R&A) slides, was critical to extrapolating essential data.

Third, in identifying the case study issues, it was critical to choose the appropriate problems to analyze that had the most significant impact on reducing CWT in MND-B. The initial step conducted a review of case study principles, formats, and types to ensure proper research execution and thesis application. The next step was to focus the case study research on the 1st SB innovations that had the greatest impact on reducing CWT. The last step was to center the case study research on the strategic and operational initiatives that also reduced CWT in CONUS and in the OIF Theater.

Fourth, in explaining the case study solutions employed, it was necessary to examine who, what, where, when, why, and how decisions were made to reduce CWT, across the entire logistics pipeline. Specifically, what decisions were directly related to strategic and operational organization initiatives, and not just related to 1st SB innovations? To this end, a survey was sent to key unit commanders and SPO that had a detailed knowledge of the 316th ESC or the MND-B operations.

Fifth, in describing the case study results, it was fundamental to examine each innovation and analyze the associated CL IX performance data for the significance of the impact to CWT. A search of DOD's Supply Chain Integration and the Army's ILAP Website and their related CWT toolboxes, revealed substantial CWT information.

Therefore, a triple approach using literature review, narrative case studies, and a survey was conducted to answer all research questions. The main objectives of the case studies and the literature review were to answer the primary and secondary research

questions, respectively. The purpose of the survey was to obtain unbiased feedback as related to the significance of the 1st SB, theater, or strategic innovations on reducing CWT in MND-B. This three pronged research approach influenced how data was collected.

How Data Was Collected

A review of DOD, Joint, and Army distribution and supply management policies, doctrine, and publications was conducted to obtain a broad understanding of the topic. The data collected provided basic information on who the key players were, what their mission was, how they operated, and what their standards were. Additionally, several non-military books and reports provided a better appreciation of current business practices and a new perspective on the subject.

To answer the primary research question of how the 1st SB reduced CL IX CWT in MND-B, the main effort was to collect data on the 1st SB from their arrival in Kuwait in September 2007 to their departure from Iraq in December 2008. This collection was obtained by visiting the 1st SB at Fort Riley, Kansas to review their OIF 07-09 rotation database.

Several key documents were obtained which described the brigade's task organization, OE, concept of support, monthly R&A data, and deployment After Action Reports. More data was acquired at the Combined Arms Support Command Website that maintains Unit After Action Report documents and the Army Logistician Management College Website that maintains *Sustainment Magazine* articles, such as OIF topics.

To address the secondary research questions of what actions other organizations implemented to reduce CWT, the primary goal was to collect data on national enablers

and theater commands that were in place and operating during the 1st SBs deployment. This collection was obtained using a two-fold approach.

First, an examination of websites from national enablers such as DOD, USTRANSCOM, DLA, and AMC revealed useful information. A wealth of data was also found on subordinate organization websites such as Distribution Process Owner, Supply Chain Integration, and Logistics Integrated Warehouse, respectively. Specific CWT statistics were generated on the Supply Chain Integration and ILAP Websites by entering requisite data in their search parameters. Moreover, some websites contained briefings that outlined their organization's current operations and future plans.

Second, a subsequent inspection at the 1st SB was conducted to look for 1st TSC and 316th ESC specific documents. The documents found, described the ESC task organization, OE, concept of support, monthly R&A data, and deployment lessons learned. Supplementary data for the 1st TSC and 316th ESC was also acquired at the Combined Arms Support Command, Army Logistician Management College, and unit websites.

To validate the findings on the research questions, a survey was administered by the Command and General Staff School Quality Assurance Office to select logisticians to collect their impartial feedback. These select logisticians included SB, CSSB, and BSB commanders and theater, brigade, and battalion SPO. The survey consisted of seven questions that focused on any causes that might have resulted in higher CWT in October 2007 and any innovations that might have reduced CWT by January 2008. A copy of the survey document can be found in Appendix B and associated survey results are located in Appendix C.

Data Presentation and Analysis Plan

The data presentation and analysis plan involved using case studies to highlight new information and sustainment innovations that optimized distribution and supply operations in MND-B. Moreover, it involved using survey results to either corroborate or contradict the initial case study findings.

The case study model presented in this thesis will follow a standard framework to describe the background, the initiative, and the significance of specific data collected. The framework design is: situation, approach, and results. This style was chosen to best tell the story of three distinct innovations implemented from October 2007 to January 2008 that resulted in reducing CWT in MND-B.

At the end of each case study there is a survey participant perception paragraph. The paragraph provides an explanation of the survey data and depicts its associate survey question results in a chart. This explanation ties the survey question results directly back into the case study results. The data comparison confirms, proves nothing, or denies the significance of any innovation implemented to reducing CWT in MND-B. Additionally, there is a case study epilogue that links each case study with the one that preceded it.

Research Strengths

As the research developed, several strengths and weakness emerged in the literature search, document exploration, and survey design. In the end, this research journey was a systematic effort to gain knowledge and understanding about the problem statement. As a result, a comparison of research strengths and weaknesses was made to ensure all vulnerabilities were mitigated, minimized, or known so that its negative impact could be properly evaluated.

First, a strength of the literature search was the readily availability of source material. Relevant DOD, Joint, and Army policies, doctrine, and reports were generally available online. Moreover, the Combined Arms Research Library at Fort Leavenworth, Kansas provided an excellent source of logistics related materiel and repository for comparable Masters of Military Art and Science theses. Finally, Amazon.com provided an economic way to purchase used copies of hard to find books that were applicable to the research.

Second, a strength of the document exploration was the ready availability of Unit After Action Reports posted by Combined Arms Support Command on the Battle Command Knowledge System Website. Also, CWT data was accessible after obtaining a username and password from the ILAP and Supply Chain Integration Websites. Moreover, the 1st SB S6 maintained an external hard drive that contained data from their OIF 07-09 deployment.

Third, a strength of the survey design was the deliberate, purposeful selection of the survey sample that consisted of key unit commanders and SPO that had intricate knowledge of the OE, concept of support, innovations developed, and associated impact. Moreover, the survey questions on the questionnaire were developed to provide crucial feedback to assess each case study innovation. The blank text block for individual feedback proved to be especially valuable.

Research Weaknesses

First, a major challenge of the literature search was accumulating and assimilating vast quantities of information that had to be read, organized, and properly applied to support the thesis research questions. Paradoxically, despite the volume of literature

available on OIF in general, there was a shortage of published information that specifically addressed CL IX CWT topics in the MND-B during the Surge. Most applicable publications were RAND articles that pertained to OIF from 2003-2005.

Second, the weakness of the document exploration was three fold. The 316th ESC, 1st SB, and MND-B's Secret Internet Protocol Router Network no longer maintained distribution and supply data from 2007. Some information found was unable to be declassified. Consequently, desirable information was simply unavailable or could not be used in this thesis.

Third, a weakness of the survey that became apparent only after its execution was that some strategic level questions were framed too broadly and resulted in unusable data. Some survey respondents were also not familiar with the specifics of several USTRANSCOM, DLA, and AMC initiatives.

Summary

This chapter provided an explanation of the methodology used to answer the basic research question. The literature review provides a doctrinal foundation. Case studies are the heart of the data presentation and analysis, providing both information and its context. The case study results are supplemented by participant perceptions derived from survey data, adding an element of quantitative corroboration to largely qualitative data.

CHAPTER 4

ANALYSIS

Introduction

This chapter is organized into four sections: an introduction, operational overviews, case studies, and survey data analysis. The titles for the respective case studies are: FOB Hammer, Convoys, and Consolidated Database.

Operational Overviews

Multi-National Corps Iraq

The primary operation in MNC-I from February to November 2007 was Operation *Fard al-Qanoon* (Enforcing the Law), also known as the Baghdad Security Plan. The operation consisted of securing the nine Baghdad administrative districts: Adhamiyah, Karkh, Karadah (Kharadah), Kadhimyah, Mansour, Sadr City (Thawr), Al Rashid, Rusafa and Tisa Nissan.

The plan itself comprised of three key phases: clear, control and retain. The first phase was to clear out insurgents to protect the population. The next phase was to control the cleared areas by building joint security stations throughout the city and maintaining Coalition presence in the neighborhoods. The final phase was to retain the cleared areas by transitioning responsibility to Iraqi security forces. See figure 15 for key operations.

Other major operations in MNC-I from June to August 2007 were Operation Phantom Thunder to secure Baghdad and eliminate all insurgent safe havens in the Baghdad Belts. The operation ended with Coalition and Iraqi Security Forces securing

40 percent of Baghdad and transitioning to Operation Phantom Strike to secure Baquba in Multi-National Division-North.

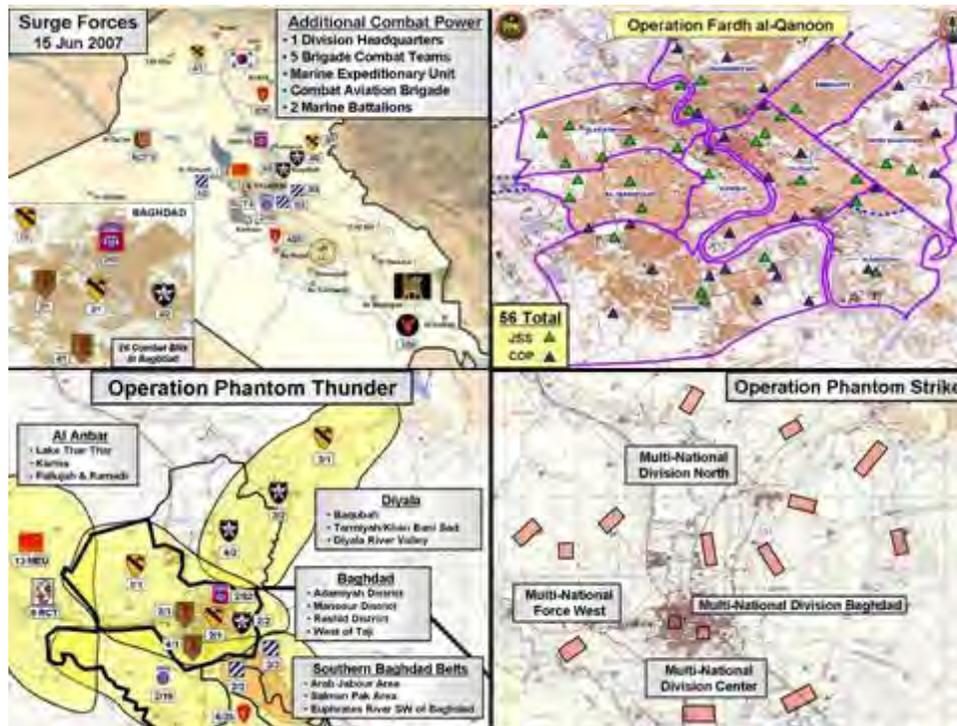


Figure 15. Multi-National Command-Iraq Key Surge Missions in 2007
Source: MNC-I, “LTG Odierno's Iraq Brief,” (Baghdad Iraq, 17 January 2008), http://theredhunter.com/2008/01/iraq_briefing_17_january_2008_ltg_ray_odierno.php (accessed 17 January 2011).

The next primary operation in MNC-I during the time period of this thesis was Operation Phantom Phoenix from January to February 2008. The plan was to provide increased security for Baghdad and eight other major cities in Iraq. In MND-C, it was called Operation Marine Thunderbolt with a mission to clear insurgent safe havens in the southeast Baghdad Belts. In the Multi-National Division-North, it was called Operation Iron Harvest with an aim of clearing insurgents in central and northern Iraq.

By the end of February 2008, MNC-I had made substantial gains in securing the city of Baghdad, the Baghdad Belts, and major cities throughout Iraq. This had a significant positive impact on the OE.”In November 2007, Brigadier-General Qassim Moussawi said the decline in violence would allow the government to reopen 10 roads this month that had been closed for security reasons.”¹

Multi-National Division-Baghdad

The 1st Cavalry Division assumed control of MND-B from November 2006 to December 2007 during OIF rotation 06-08. The mission of the 1st Cavalry Division was to conduct full-spectrum operations to secure Baghdad, to reduce sectarian violence, and facilitate the transition of Baghdad to Iraqi Security Forces control. The 4th Infantry Division subsequently assumed control of MND-B from December 2007 to February 2009 during OIF 07-09 rotation.² The MND-B task organization is shown in figure 16.

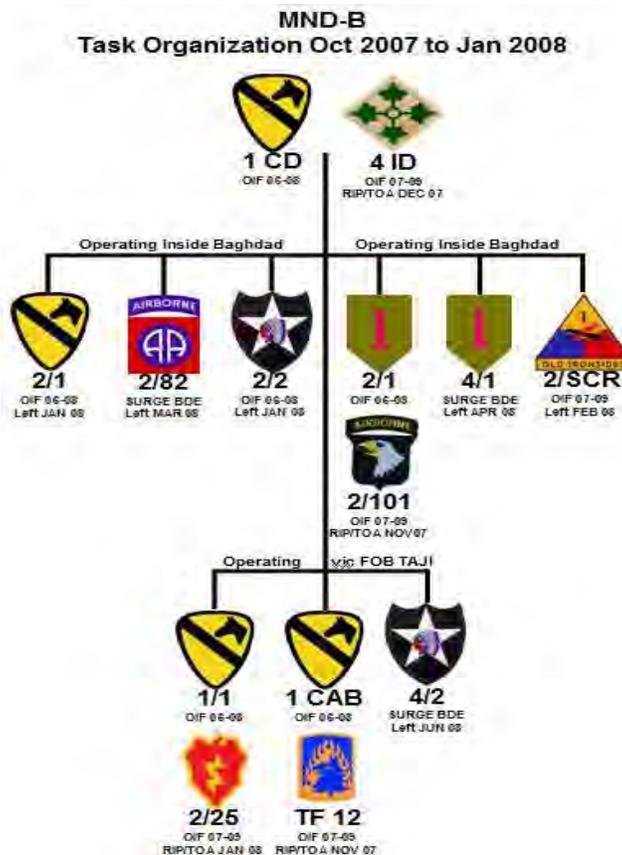


Figure 16. MND-B Task Organization October 2007 to January 2008
 Source: 1st SB, “RCAAT Brief” (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009). Author created.

The five Surge Brigades arrived incrementally in Iraq between January and June 2007. The Surge strategy from February to November 2007 was called Operation *Fard al-Qanoon* which “divided Baghdad into grids, each with an Iraqi brigade and a U.S. battalion. U.S. platoons rotated in and out of Joint Security Stations. Half of the surge forces deployed outside Baghdad taking the fight to [enemy] sanctuaries.”³

The MND-B division, headquartered at VBC, controlled nine brigades within the greater Baghdad area. These brigades were located with 1/1 IBCT, 1 ABC, 2/82 IBCT and 4/2 SBCT at Camp Taji, 2/1 IBCT and 2 SCR at VBC, 2/1 IBCT in the International

Zone, 4/1 IBCT at FOB Falcon, and 2/2 IBCT split between FOBs Rustamiyah and Loyalty. Moreover, the brigades were task organized into battalion and company level COPs and platoon-level Joint Security Stations. Figure 17 shows key unit and sustainment locations.



Figure 17. 1st Sustainment Brigade Operational Environment
 Source: 1st SB, “RCAAT Brief” (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009). Author created,

Multi-National Division-Center

The 3rd Infantry Division was responsible for MND-C and controlled six brigades. The 7th SB which was located at Tallil provided DS sustainment support to the 3rd Infantry Division. However, the 1st SB provided area support sustainment to 3/3 IBCT east of Baghdad at FOB Hammer, 2/10 IBCT and 2/3 IBCT south of Baghdad at FOB Mahmudiyah, and on-call support to 4/25 IBCT located south of FOB Mahmudiyah. This complex support command relationship was created because of extended time distance factors between the 7th SB and its customers in MND-C. Moreover, FOB Hammer was a newly rebuilt base, to support the arrival of one Surge brigade and was operational by March 2007. The MND-C task organization is shown in figure 18.



Figure 18. MND-C Task Organization October 2007 to January 2008.

Source: 1st SB, RCAAT Brief (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009). Author created.

1st Sustainment Brigade

The brigade assumed full mission responsibility on 19 October, 2007. The 15th SB provided an effective Relief-in-Place which included detailed briefs and extensive tours to higher headquarters, external customers, internal battalions, and Logistics Civil Augmentation Program enablers. This action provided excellent situational awareness and an opportunity for the 1st SB to begin building positive relationships. Moreover, the 15th SB provided the 1st SB with comprehensive continuity files that consisted of essential operation orders, maps, concept of support, sustainment reports, intelligence data, standard operating procedures, and administrative documents.

Although the OIF Theater had matured since 2003 and logistics stocks were robust, the dynamics of sustainment support during the Surge were complex and challenging. The 1st SB found it necessary to conduct another review of all concepts of support and performance data from the 316th ESC, customer BSBs, and internal CSSBs to better visualize and understand the entire theater's OE.

Moreover, the brigade commanders and staff conducted multiple tours of all critical 1st SB support nodes such as SSA, CRSP, and rotary and fixed-wing pallet building and loading areas. These document reviews and personal eyes on tours identified several friction points with C2 and lack of personnel or equipment that negatively affected operational reach and flexibility. Thus, the initiatives that followed as case studies were born from deliberate investigation, analysis of evidence, and a conviction based on previous experience that things could improved.

Case Studies

The Case Study Format: Why and How

The purpose of this chapter is to present three case studies that will answer the primary research question of how the 1st SB reduced MND-B CWT. The following format will be used to frame each case study: situation, approach, and results. Each case study will conclude with survey participant perceptions to link their impartial feedback to impact of 1st SB innovations and a case study epilogue to highlight subsequent effects.

Case Study One: Forward Operating Base Hammer

The Situation

–Most organizations have a DoD Activity Address Code (DODAAC) that has three distinct addresses. These are called type address codes (TACs). TAC 1 is mailing address, TAC 2 is freight address, and TAC 3 is the billing address.”⁴ The 316th ESC concept for CL IX operations in October 2007 consisted of 26 SSAs and one Forward Reissue Point in MNC-I. The 1st SB, a subordinate of the 316th ESC, managed eight SSAs in MND-B and provided CL IX distribution to three MND-C SSAs at FOB Hammer, VBC, and FOB Mahmudiyah. See figure 19 for support concept.

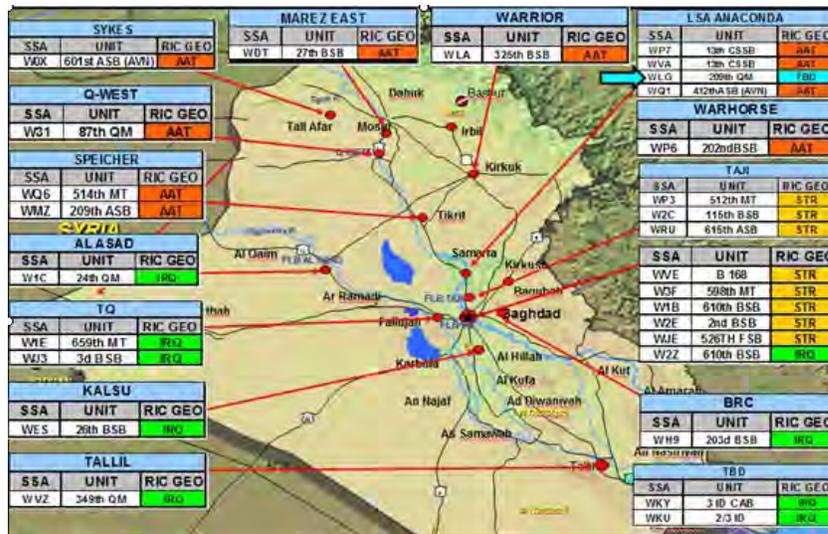


Figure 19. Theater Supply Support Activity Concept

Source: 316th ESC, "Lessons Learned" (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2007), <http://www.cascom.lee.army.mil> (accessed August 2010), slide 61.

The 3/3 IBCT was the fourth of five Surge brigades and closed at FOB Hammer on March 2007. The brigade mission was to deny enemy freedom of movement and disruption of Anti Iraqi Force activities to contribute to the safety and security of the Iraqi citizens within OE Hammer. The BCT had been operating on the outskirts of eastern Baghdad for seven month before the 1st SB assumed the mission to provide sustainment. As stated in the 1st SB overview, the SPO conducted a review of all pertinent concepts of support, performance data, and multiple tours of key logistics nodes. As a result, he discovered three important facts. First, some SSAs in their support area did not meet the Army's CL IX performance standards. The SPO obtained this information from LOGSA's pipeline performance slide, which the 316th ESC SPO sent out a monthly. The data indicated that CWT in October 2007 for FOB Hammer's SSA was 27 days, some 12 days

over standard. This is one of the highest CWTs for an SSA in theater. Something was not happening right and it deserved a deeper investigation into the root cause.

Second, there were several choke points in the supply pipeline, such as multiple handling points. The SPO obtained this information from the 316th ESC concept of support, which showed that FOB Hammer's Freight Sipping Address (TAC 2) was at Balad APOD, located outside MND-B, and not the VBC APOD located within MND-B. This meant CL IX was downloaded and transported from the airfield to a pallet holding area and staged for onward movement. The CL IX was then uploaded, transported, downloaded, and staged at the Corps Distribution Center (CDC) for onward movement.

Third, there were numerous choke point events in the distribution pipeline, such as convoy frequency. The SPO obtained this information from the 316th ESC's concept of support, which showed that CL IX distribution from Balad to FOB Hammer had an intermediate stop at FOB Taji. There were no direct routes from Balad to FOB Hammer, and FOB Taji had no operational fixed-wing airfield. This meant every 48 hours, the 213th ASG would upload CL IX staged at the CDC in Balad and transport to FOB Taji's CRSP yard, where it was downloaded and staged for final movement. The 1103rd CSSB would then transport the CL IX to FOB Hammer's SSA.

In short, the CL IX flow took an average of six to seven days from APOD to customer unit. The 1 SB SPO wondered, could they eliminate one of the two intermediate stops, and could that be accomplished with something as simple as flying supplies destined for FOB Hammer to a different airfield?

The Approach

As a result, the 1st SB SPO pondered several courses of action to resolve the high cargo transit time and multiple handling procedures. He had his General Supply Officer use ILAP which was designed to evaluate the Army's logistics system performance in the field, to research CL IX data for FOB Taji and FOB Hammer SSAs. Using vehicle engines as a test, to limit the volume of data, he discovered there was a significant delay in distribution from the Balad APOD to the Taji CRSP and SSA. Most of the key supply and distribution nodes in theater, such as airfields, CRSPs, and SSAs had cargo interrogators which recorded in-transit visibility of items in ILAP. Using the date and time when items were interrogated, one could analyze the effectiveness of the distribution and supply process.

Could the CL IX process from Balad APOD to the CDC be sped up?

After discussion with the 213th ASG SPO, who managed the CDC, the 1st SB SPO knew several new facts: the CDC was operated under a KBR contract, the CDC was operating at maximum capacity, and any changes to the existing contract would take time.

Basically, this course of action would be a long term solution and require additional funding to increase the number of employees and MHE.

Alternatively, could the CL IX process from Balad CDC to FOB Taji be sped up?

After coordinating with the 213th ASG SPO, who managed the ESC distribution run from Balad CDC to FOB Taji, the 1st SB SPO discovered that the 213th ASG did not have the additional transportation nor security platforms available to increase convoy frequency. Moreover, after discussion with the 1103rd CSSB SPO, who had the FOB Hammer support mission and three transportation companies, the 1st SB SPO realized

that the 1103rd CSSB did not have the transportation nor security platforms available to increase convoy frequency either. The 1103rd CSSB was completely committed to supporting customer brigade requirements for concrete barriers and supplies to build Joint Security Stations and COPs within Baghdad.

Finally, could a change in APOD and TAC 2 speed up the CL IX flow?

A quick visualization of the concept of support provided an obvious conclusion. FOB Hammer was supported from too far away. The SPO calculated the distance, travel, and CL IX processing time from Balad APOD to FOB Hammer and VBC APOD to FOB Hammer. He discovered the distance time factors were 98 miles in six to seven days and 55 miles in two to three days, respectively. It was a sustainment revelation. This had to be the right solution.

Upon reaching this conclusion, the 1st SB SPO contacted the 168th BSB commander and SPO, stationed at VBC, and asked them if they had the transportation and security assets to assume distribution to FOB Hammer. After a quick assessment, they responded that their unit could assume the mission, but required a reduction in missions to deliver concrete barriers to Baghdad. If this proposal could be implemented, it meant CL IX could be downloaded and transported from the VBC APOD to a pallet holding area. Within 12 to 24 hours, the CL IX could then be uploaded, transported, and staged for onward movement by 68th CSSB. The 168th BSB could transport the CL IX to FOB Hammer's SSA within one to two days, see figure 20 for the plan.



Figure 20. FOB Hammer Freight Address Change Plan
Source: 1st SB, RCAAT Brief, February 2009. Author created.

Next, the SPO requested the 1st SB brigade commander's approval to change their concept of support since it would violate the “no change in first 90 days” guidance from theater. It was imperative that 3/3 IBCT have improved cargo transit time to increase their operational readiness and reach in the southeastern Baghdad Belts.

Once approved, what steps were required to actually accomplish the change? First, the 1st SB SPO briefed the 7th SB SPO, who supported 3/3 IBCT and the MND-C unit, on the proposed plan and potential for improvements in CL IX flow. There were no issues and concurrence was given. Next, he coordinated with the 316th ESC SPO to

obtain higher headquarters official approval for the TAC 2 change. This ensured all key sustainment units and agencies were notified and synchronized to execute the new plan.

Finally, the SPO briefed customer BSB SPO, the MND-B G4, and subordinate units on the impending change during his weekly “breeze” meetings via Adobe Connect Pro. This communication method provided an effective way to promptly inform, coordinate, and conduct current and future sustainment operations. The real potential for improvement would be a reduction in cargo transit time that would reduce CWT at FOB Hammer SSA.

The Results

There were several efficiencies gained as the result of changing the location of FOB Hammer's TAC 2. The first was a decrease in CL IX cargo transit time due to a substantial reduction in multiple cargo handling and stage times. Second, the 1103rd CSSB now had available transportation and security platforms, for use three times a week, since they no longer had the distribution mission to FOB Hammer. “The average CWT for FOB Hammer dropped from 27 days to 20 days from October 2007 to January 2008.”⁵

A key to improving customer support was recognizing that eliminating one intermediate stop, reducing redundant uploads and downloads at the APOD and CDC, and minimizing time spent in CRSP yards could cut the overall distribution time from the airfield to the receiving unit. The average CL IX cargo transit time from Balad APOD to FOB Hammer and VBC APOD to FOB Hammer was six to seven days and two to three days, respectively. This represented a 50 to 70 percent reduction in average cargo transit

time. Obviously, this did not account for all seven days of CWT improvement, but it was a big step in the right direction.

The 1st SB SPO later discovered that the 203rd BSB SPO had implemented several initiatives to improve CL IX flow to FOB Hammer. These initiatives established Liaison Officers at the Kuwait APOD, Balad APOD, and VBC APOD to search for CL IX parts at local warehouses and to facilitate distribution of them once obtained. Moreover, he coordinated for rotary wing support from Balad, VBC, and Taji heavy pads to fly CL IX directly to FOB Hammer until combat operations consumed all or most of the available rotary-wing assets. These initiatives probably accounted for some decrease in CWT.

Participant Perceptions

The survey questionnaire sent out to the 1st SB and MND-B BSB commanders and SPO provided this investigation with corroborating data. Over 83.3 percent of the survey population responded indicating slightly, mostly, or a highly effective impact, when the 1st SB SPO changed the TAC 2 of FOB Hammer from Balad to VBC. See the chart in figure 21 for the actual survey results to the question.

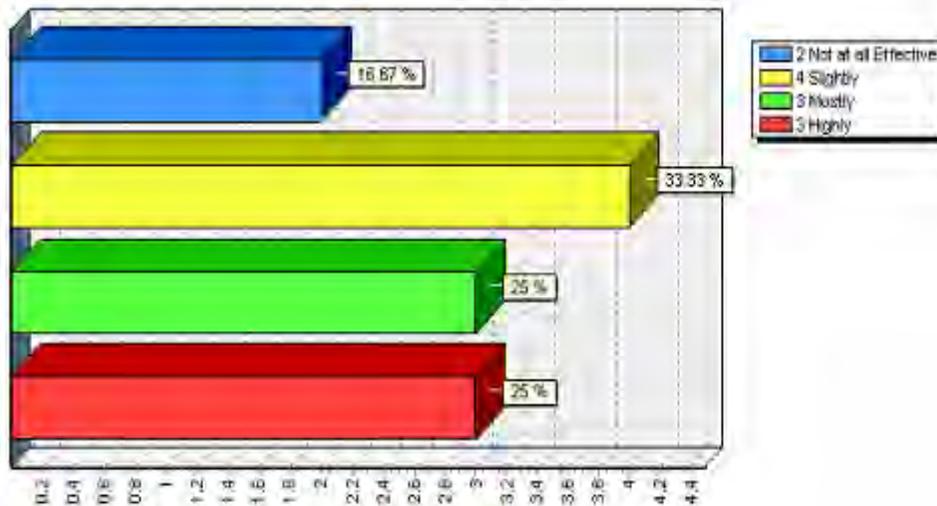


Figure 21. FOB Hammer TAC-2 Change from JBB to VBC

Source: CGSS Quality Assurance Office, LTC Welling Survey Questionnaire Results, 24 November 2010, 14.

Case Study Epilogue

After the first initiative of changing the TAC 2 of FOB Hammer was complete, the 1st SB SPO requested the commander implement a monthly brigade R&A brief to establish and capture performance metrics and data for critical supply, distribution, maintenance, and contract operations. This action allowed the brigade and subordinate units to see their monthly performance, identify positive and negative trends, and allocate any resources to improve operations.

The 1st SB SPO, encouraged by the fact that supply and distribution operations could be improved in a mature theater, pondered other ways to enhance sustainment, effectiveness, and efficiency. He had an idea related to his second course of action for FOB Hammer. Could he increase convoy frequency from Taji to Balad? The answer to that question was a resounding yes. But how to do it?

Case Study Two: Convoys

The Situation

–Distribution operations include: receive, store, issue, distribute, trans-load, configure, reconfigure, classify, and collect stocks and unit equipment.’’⁶

The 316th ESC concept for CL IX distribution in October 2007 was comprised of 12 distribution runs, named after sodas, to one General Support hub at Balad Logistical Support Area Anaconda and nine DS hubs within MNC-I. This plan was called Hub and Spoke. The hub was at Balad with most distribution spokes radiating to SB hubs and a few radiating between SB hubs. The ESC augmented some of their distribution runs with KBR contract transportation. The majority of these convoys were for postal or bulk fuel missions. Within MND-B, the distribution frequency for these KBR convoys was every other day. Figure 22 depicts the 316th ESC Hub and Spoke distribution support concept for Iraq.

The 1st SB initially had two sustainment distribution runs, with one dedicated between the DS hubs at FOB Taji and VBC and one dedicated from VBC to the General Support hub at Balad. All distribution was conducted by the 1103rd CSSB based from Taji. Moreover, the 213th ASG, located at Balad, executed a distribution run from Balad to FOB Taji. In October 2007, the distribution frequency for convoys between the DS hubs at Taji and VBC was daily and between the DS hubs and General Support hub at Balad was every other day. The 1103rd CSSB operated a consolidated SSA at Taji and the 168th BSB operated an SSA at VBC. –Because of movement priorities and the shortage of available transportation assets, transportation allocations for class IX supply were inadequate.’’⁷

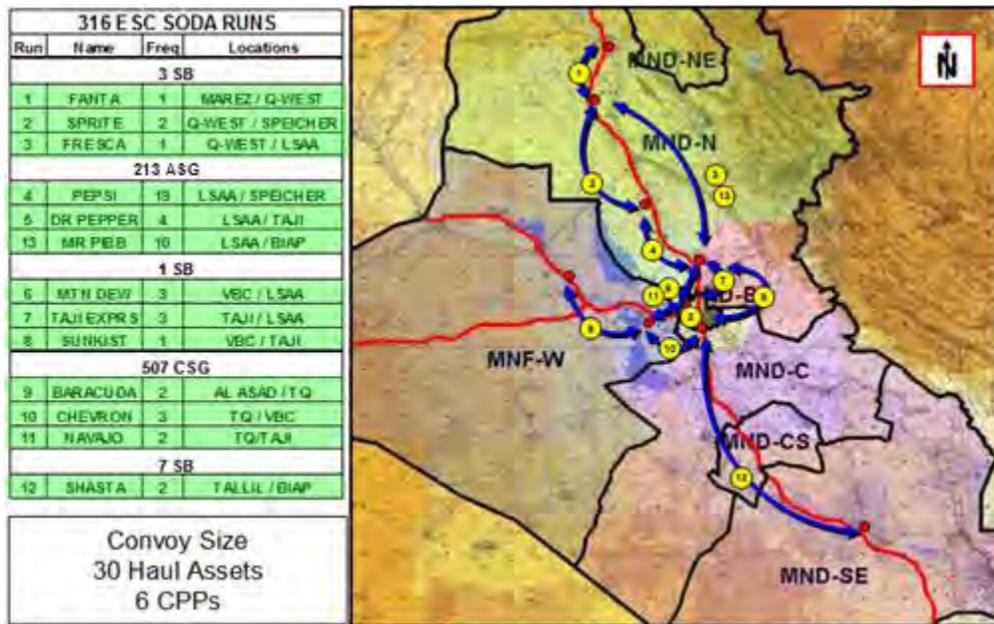


Figure 22. 316th Expeditionary Support Command Distribution Concept.
Source: 316th ESC, RCAAT Brief (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2007), <http://www.cascom.lee.army.mil> (accessed August 2010), slide 57.

This statement held true at the beginning of OIF rotation 07-09. The MNC-I priority of effort was deployment, redeployment, sustainment, and retrograde mission. Within the 13 sustainment priorities, aviation CL IX was second and ground CL IX was seventh. The 1st SB SPO conducted more tours of key distribution nodes to gather new facts and assumptions for developing fresh courses of action to re-mission the 1103rd CSSB CLPs. As a result, he discovered three important facts.

First, some SSAs in their support area were not operating efficiently. The SPO obtained this information from SSA performance data sent out by the 316th ESC SPO monthly. The data indicated that CWT in October 2007 for the Taji and VBC SSAs were 33 days and 26 days, respectively. Also, he received several emails from BSB SPO who

were concerned their units were not receiving timely CL IX. Something was not happening right and it deserved a deeper investigation into the root causes.

Second, there were choke points in the supply pipeline such as a lack of KBR contract warehouse personnel and dedicated MHE in the Taji SSA. The SPO obtained this information from personal observation of the numerous 20 and 40 foot CL IX containers that were stacked up and unprocessed in the SSA holding yard.

A good initiative by the 15th SB was to consolidate four Taji-based brigade SSAs into their SSA; however, this turned troublesome when KBR was unable to rapidly hire additional manpower to handle the increased volume. To make matters worse, the existing contract performance work statement did not specify a requirement for dedicated MHE at the SSA. The performance work statement was written to support customer units on a first come, first serve basis. This made it problematic to effectively operate an SSA to support five brigades 24 hours a day. Moreover, the SPO found several Rough Terrain Container Handlers (RTCH) from 1103rd CSSB's Theater Provided Equipment (TPE) sitting unused in a motor pool.

Third, there was a choke point in the distribution pipeline: there was no operational fixed-wing airfield at FOB Taji. The SPO obtained this information through a review of the 316th ESC concept of support and personal observations at the Taji airfield and heavy pad. All other key sustainment hubs in MNC-I had a fixed-wing airfield; FOB Taji was the exception. As a result, distribution to FOB Taji required an intermediate stop in Balad.

Also, the Special Troops Battalion Commander received several emails from customers who were concerned their units were not receiving mail in a timely manner.

His intuition led him to believe there may be a problem with distribution between FOB Taji and Balad. This situation was similar to the problem identified in the FOB Hammer case study but could not be rectified with a TAC 2 change. Shifting TAC 2s for all five Taji based brigades from the Balad APOD to the VBC APOD would overwhelm Victory's capacity to process all the CL IX.

In short, a distribution frequency of every other day from Balad to Taji for CL IX and multi-class supplies was not effectively supporting the Taji based units. The 1st SB SPO wondered could they eliminate this non-optimal distribution setup. Could this be accomplished with something as simple as creating a daily distribution run between Balad and Taji and better use of available TPE and contract equipment?

The Approach

—Movement control is planning, routing, scheduling, coordinating, controlling, and the in-transit visibility of personnel, units, supplies, and equipment moving over LOCs and committing transportation support IAW command planning directives.”⁸ The 1st SB SPO had his Distribution Chief and Non-Commissioned Officer in Charge conduct an analysis of their distribution operations. This consisted of reviewing the brigade's transportation assets, utilization rates, and conducting mission analysis for improving distribution. As a result, he pondered several courses of action to resolve the high cargo transit time and multiple handling procedures with internal operations at Taji and external missions to Balad.

First, could the process of CL IX flow at the Taji SSA be sped up? As stated earlier, the 1st SB SPO discovered there was no dedicated MHE at the SSA, but there was unused TPE, such as six RTCH. After coordinating with the 1103rd CSSB SPO, he

discovered that the 1103rd CSSB could operate several of the unused RTCH and flatbed trailers, for use as Trailer Transfer Points at their SSA. The 1st SB SPO also spoke with the Taji based KBR contract managers for Contractor Logistics Support for SSA operations and Theater Transportation Mission for distribution operations, including the ESC Contracting Officer. After discussion with KBR and the ESC Contracting Officer, he realized that a potential existed to adjust the existing contract and allow dedicated KBR MHE assets to be located at the Taji SSA.

Second, could daily CL IX distribution be achieved between Balad and FOB Taji? After discussion with the 1103rd CSSB SPO, he reconfirmed that their CLP assets that once supported distribution from FOB Taji to FOB Hammer could be re-missioned. The 1103rd CSSB still had enough transportation assets to support the Surge requirements. To build Joint Security Stations and COPs and deliver concrete barriers within Baghdad, to enhance the overall security of the area. Moreover, after discussion with the Special Troops Battalion Commander, he realized that KBR was contracted by the ESC to provide mail from the Joint Military Mail Terminal at Balad to FOB Taji four days a week. These KBR led convoys also had their own security platforms.

Third, could the CL IX process at Balad CDC to support FOB Taji be sped up? A quick visualization of the concept of support provided an obvious conclusion. FOB Taji was completely land-locked since it did not have an operational fixed-wing airfield to directly fly in supplies. The choice not to open up the fixed-wing airfield at Taji was an MNC-I decision based on concerns of limited aircraft approach directions and threat of enemy attack. After coordinating with the ESC SPO, he discovered that the only way to improve distribution flow to Taji was through rotary-wing delivery or new initiatives in

ground distribution. Rotary-wing delivery was prohibitive because of the limited available air time for sustainment missions, as the majority of helicopters were being used for combat and deployment and redeployment operations.

The 1st SB SPO came to the conclusion that the current concept for distribution was not as effective as it could be in providing responsive and flexible support to customer units, specifically at FOB Taji. Dedicating MHE at key distribution nodes and creating a daily distribution run between the 316th ESC's General Support hub at Balad and the 1st SB's DS hub at Taji, could decrease CWT in MND-B.

Upon reaching this conclusion, the 1st SB SPO contacted the 1103rd CSSB commander and SPO, stationed at Taji and asked them if they had the manpower to operate four unused RTCH in their motor pool. After a quick assessment, they responded that they had the licensed operators to assume that mission. This meant the 1st SB SPO could implement his idea of dedicating military TPE MHE at the Taji CRSP yard. This freed up to four KBR Kalmar RTCH, which with approval by the ESC Contracting Officer, could be now dedicated to the Taji SSA. This allowed each location to operate a full 24 hours a day. Figure 23 depicts the 1st SB distribution plan between their sustainment hubs, CRSPs, SSAs, and the 316th ESC hub.

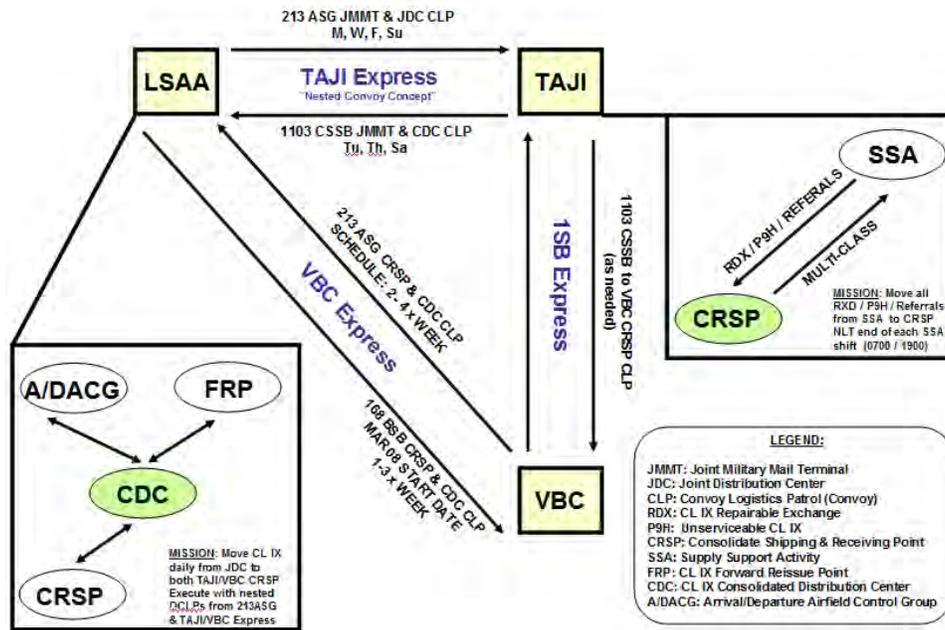


Figure 23. 1st Sustainment Brigade Distribution Synergy in MND-B. *Source:* 1st SB, “Distribution Synergy Brief” (PowerPoint slides, Taji, Iraq, March 2008), slide 1. Author created.

Next, the 1st SB re-missioned the 1103rd CSSB CLP that supported distribution from FOB Taji to FOB Hammer to a new delivery run from FOB Taji to Balad CDC. Moreover, the SPO, in conjunction with the 1st SB Special Troops Battalion and ESC Contracting Officer, integrated the 1103rd CSSB assets with KBR's Joint Military Mail Terminal assets to achieve daily distribution from Balad to FOB Taji. In concept, if two units agreed to integrate assets and conduct mission-lead on alternate days they both gained a daily distribution frequency. This was ultimately called “The Taji-Express.” It fulfilled the imperative that Taji based BCTs have improved cargo transit time to increase their operational readiness in Baghdad and the northwest belts.

The real potential for improvement was a reduction in cargo transit time that would reduce the overall CWT for the 1st SB subordinate units and Taji-based brigades.

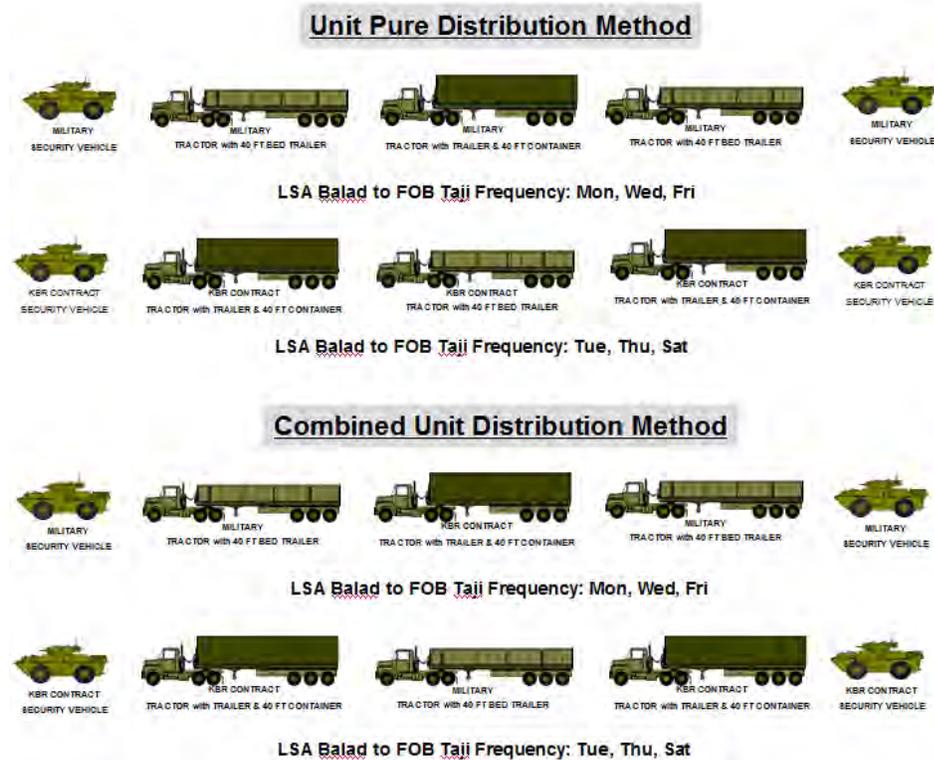


Figure 24. 1st Sustainment Brigade Nested Convoy Plan
Source: 1st SB, “RCAAT Brief” (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009). Author created.

The Results

There were several efficiencies gained as the result of obtaining dedicated MHE in the Taji SSA and establishing the daily Taji-Express distribution to Balad.

First, the CL IX processing time at the SSA improved as a result of full 24 hour operations. Previously, operations were intermittent at best, with no dedicated MHE to upload, move, or download 20 foot or 40 foot CL IX containers.

Second, the volume of multi-class supplies and mail transported between Balad and Taji practically doubled without requiring additional transportation and security assets. By nesting a three times a week multi-class CSSB CLP, with a four times a week

KBR mail convoy, the 1st SB was able to achieve a daily distribution run between the 316th ESC General Support hub at Balad and their DS hub at FOB Taji. The impact was significant. The CWT for 1st SB internal SSAs decreased from 33 to 12 days at Taji and 26 to 17 days at VBC, between October 2007 and January 2008.⁹

Participant Perceptions

The survey questionnaire sent out to the 1st SB and MND-B BSB commanders and SPO provided this investigation with corroborating data. Over 92 percent of the survey population responded indicating slightly, mostly or a highly effective impact with implementation of the Taji- Express from JBB to FOB Taji. See the chart in figure 25 for the actual survey results to the question.

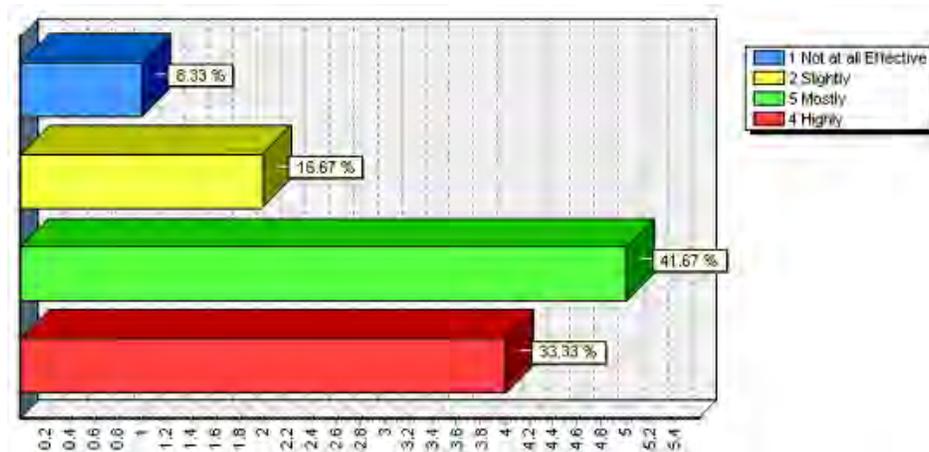


Figure 25. Nested CLPs from JBB to FOB Taji

Source: CGSS Quality Assurance Office, LTC Welling Survey Questionnaire Results, 24 November 2010, 16.

Case Study Epilogue

After the initiative of implementing dedicated MHE at Taji SSA and a daily distribution frequency from FOB Taji to Balad, the 1st SB SPO saw the value of visualizing and understanding the entire distribution system. He tasked his staff to produce several Microsoft PowerPoint charts using maps and cartoon diagrams to simplify their complex operation. These charts depicted subordinate unit tasks, delivery frequency, primary and alternate routes, and CL IX distribution, retrograde, and referral flow. The SPO called this collect of charts his distribution synergy brief.

The 1st SB SPO, encouraged again by the fact that distribution and supply operations could be improved in a mature theater, pondered other ways to enhance sustainment, effectiveness, and efficiency. He had another idea related to his numerous tours to key sustainment nodes. There was no standard brigade database for CRSP cargo. Each CSSB had its own system to manage CRSP cargo. Could he consolidate the two battalion databases to achieve a common operating picture for the brigade? But how to do it? What would be the impact?

Case Study Three: Consolidated Database

The Situation

The 316th ESC concept for CL IX pallet and container distribution in October 2007 was comprised of five CRSP yards, seven multi-class Joint Distribution Centers, and four arrival/departure airfield control groups in MNC-I, see figure 26. The 1st SB, a subordinate unit of the 316th ESC, managed two CRSP yards in MND-B: one at FOB Taji and one at the VBC. The 316th ESC implemented some initiatives that impacted the CRSP yards between June 2007 and January 2008.

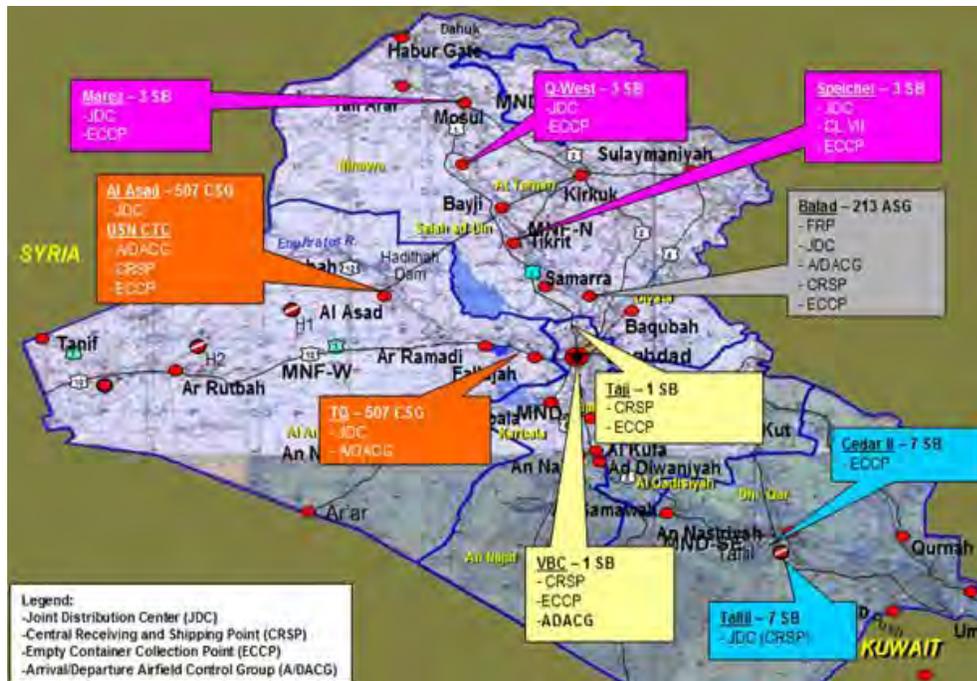


Figure 26. Theater Consolidated Receiving and Shipping Point Concept.
 Source: 316th ESC, RCAAT Brief (Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2007), <http://www.cascom.lee.army.mil> (accessed August 2010), slide 57.

These initiatives were executing a hub and spoke distribution, clearing out CL IX retrograde, starting CL IX referrals in ESC-managed SSAs, and expanding the CL IX Forward Reissue Point located at Balad. Also, the redeployment and deployment of several brigades and their materiel caused a temporary increase in CRSP cargo volume.

The 1st SB SPO conducted a review of all pertinent concepts of support, performance data, and multiple visits of the Taji and VBC CRSP yards and supporting ESC Movement Control Teams. As a result, he discovered three important facts.

First, the 1103rd CSSB at Taji and the 68th CSSB at VBC were each using a different database to manage their multi-class supply inventory in their CRSP yards. The SPO obtained this information from personal observation and asking the right questions

to the CRSP managers. This meant there was no single brigade product to visualize and understand the whole CRSP cargo process.

Second, both CRSPs were averaging about seven days in cargo transit time. The SPO obtained this information from transportation performance data the 316th ESC SPO sent out in their monthly R&A slides. The data indicated that cargo transit time was 6.8 days for Taji and 7.5 days for VBC in November 2007. This equated to one week in wait time for materiel to customer units. Something was not happening right and it deserved a deeper investigation into the root cause.

Third, there were choke points in the distribution pipeline related to a lack of dedicated military or KBR MHE in the Taji CRSP. The SPO obtained this information from personal observations and discussions with the 1103rd CSSB SPO and ESC Contracting Officer. The existing Theater Transportation Mission contract performance work statement did not specify a requirement for dedicated MHE at the CRSP yard. The performance work statement was written to support the Empty Container Collection Point and customer units on a first come, first serve basis. This was problematic; it prevented effectively operating a CRSP supporting five brigades, 24 hours a day, seven days a week. Moreover, the 1st SB SPO found six Rough Terrain Container Handler vehicles from the 1103rd CSSB's TPE sitting unused in a motor pool.

In short, the cargo transit time at Taji CRSP and VBC CRSP to customer unit was about one week in November 2007. This distribution frequency of CL IX and multi-class supplies was not effectively supporting MND-B units. The 1st SB SPO wondered, could they reduce the cargo transit time and could that be accomplished with something as

simple as consolidating the individual battalion CRSP databases into a single brigade database?

The Approach

–Battalion mode operators had to meet two challenges: deliver cargo before the Required Delivery Date, and keep the time a piece of cargo spent in the CRSPs as short as possible.”¹⁰

Although not an MTOE position, the 1st SB SPO saw the need to designate a field grade officer to specifically manage CRSP operations. The SPO then had his CRSP Distribution Chief and Non-Commissioned Officer in Charge conduct an analysis of their distribution operations. This consisted of reviewing the 1103rd CSSB and the 68th CSSB processes and conducting mission analysis for improving overall distribution. As a result, he pondered several courses of action to resolve the high cargo transit time and lack of dedicated MHE at both locations.

Could the cargo transit flow between the 1st SBs CRSP and SSA be sped up? As stated earlier, the 1st SB SPO discovered there was little or no dedicated MHE at the CRSP yards. After coordinating with the 1103rd CSSB and the 68th CSSB SPO, he discovered that one unit could operate several unused TPE RTCH or obtain additional MHE at their CRSP, respectively.

Could the cargo transit time between other SB CRSPs be sped up? After coordinating with other SB SPO and the ESC SPO, the 1st SB SPO knew several new facts: each SB had their own CRSP processes, the ESC had no consolidated CRSP database, and improving split TMR operations could have a positive impact on lowering cargo transit time.

Could a consolidated CRSP database speed up the cargo transit flow?

A quick visualization of the current report format and procedures provided an obvious conclusion. A consolidated database was needed to better visualize, understand, and synchronize the entire CRSP inventory, scheduling, and distribution process. With each CSSB using their own database it was difficult for the brigade to get a common operating picture of what commodities were staged, what needed to move, what was coming in, and what needed to change. This was an inherently inefficient process.

The 1st SB SPO conducted battlefield circulation to each subordinate transportation section. As a result, at the 168th BSB he discovered an innovative Microsoft Access Based program used to plan, synchronize, and execute TMR operations. The 168th BSB was executing sustainment distribution to all ~~non-Taji~~ and non-VBC” brigades with ease.

The 1st SB SPO asked for a demonstration of the program by the Soldiers who created it, on how it could effectively plan, manage, and track transportation missions. The demonstration was enlightening. The 168th BSB Soldiers described how their database evolved from an archaic method of manually counting colors on a spreadsheet to using the new software to automate management functions. This program drastically improved cargo visibility and distribution planning.

The SPO then asked if this program could be expanded to include cargo from the CRSPs yards. The 168th BSB Soldiers answered that it could be done and took on the challenge to create a consolidated brigade TMR and CRSP database. Figure 27 is a screenshot of the consolidated database.



Figure 27. Snapshot of Consolidated TMR and CRSP Database Program
Source: Nadine S. Johnson, Chief Warrant Officer 2, “Providing Checks and Balances at the CRSP” (1st SB SPO Deployment Files, Fort Riley, Kansas, October 2008), 1.

Upon reaching the conclusion that this program could optimize distribution management, the 1st SB SPO decided to adopt the 168th BSB's Microsoft Access TMR database program as the brigade standard. It would provide the 1st SB SPO and subordinate SPO sections with a single document to review all CRSP cargo movement during the twice daily Distribution Movement Board. This program was placed on secure share point for all key players to review and update, to include CRSP Liaison Officers. The 1st SB Battalion Liaison Officers were instrumental in ensuring the right priority cargo moved at the right time and any available empty space was loaded with the oldest cargo.

Next, the 1st SB conducted CRSP meetings twice a week to check the accuracy of cargo inventory, destinations, and Estimated Ship Dates. The meeting provided a forum for the brigade CRSP managers, battalion transportation sections, and Movement Control

Teams to discuss any new trends and developments. The brigade CRSP manager facilitated external coordination with the other SB and operational mode managers in Iraq.¹¹

Finally, the brigade conducted an Operational Planning Group with subordinate units. All concerns were addressed and concurrence was achieved. A brigade Fragmentary Order followed, that implemented this change in the concept of support. Additionally, the 1st SB tasked the 168th BSB to provide a mobile training team to train the 1st SB and 1103rd CSSB distribution sections. The real potential for improvement was a reduction in cargo transit time.

The Results

The consolidated brigade CRSP database provided a common operating picture for all key 1st SB distribution managers and Liaison Officers at CRSP nodes in their OE. All 1st SB distribution managers were able to achieve a higher level of synergy through enhanced cargo visibility. What was the impact? The average cargo transit time for both 1st SB CRSPs in October 2007 was 7.15 days. By January 2008, the average cargo transit time for both CRSPs was 3.0 days, a 58 percent or four day reduction in delivery time.

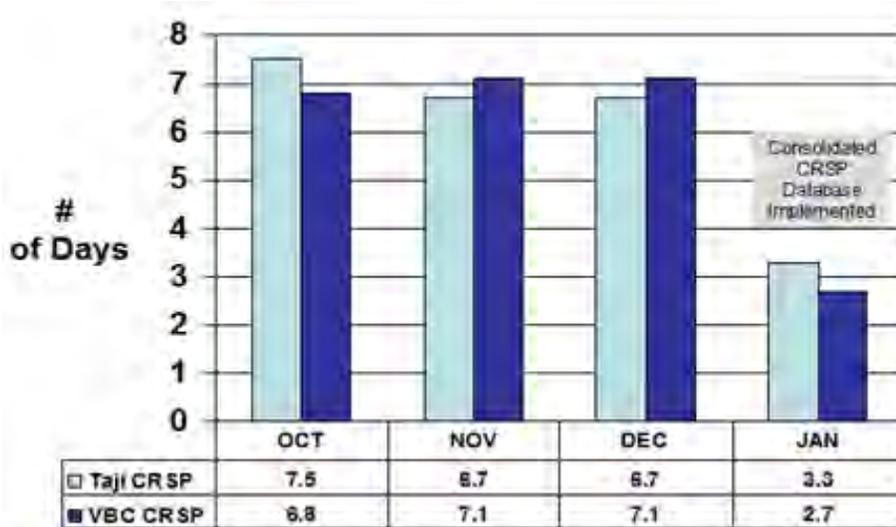


Figure 28. 1st Sustainment Brigade Average CRSP Cargo Transit Time
Source: 1st SB –Review and Analysis” (Brief, Taji, Iraq, October 2008). Author created.

Participant Perceptions

The survey questionnaire sent out to the 1st SB and MND-B BSB commanders and SPO provided this investigation with corroborating data. Over 92 percent of the survey population responded indicating a slightly, mostly, or highly effective impact for implementation of a brigade consolidated CRSP database. See the chart in figure 29 for the actual survey results to the question.

A single consolidated brigade CRSP database

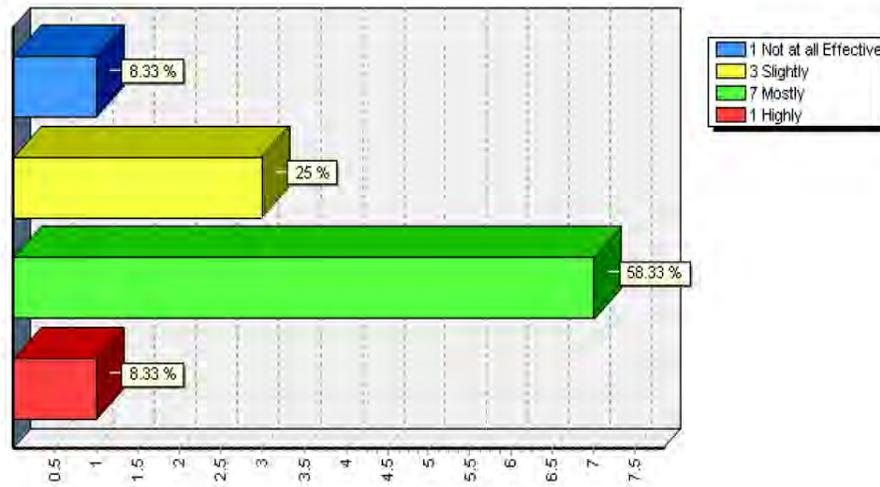


Figure 29. A Single Consolidated Brigade CRSP Database

Source: CGSS Quality Assurance Office, LTC Welling Survey Questionnaire Results, 24 November 2010, 17.

Case Study Epilogue

After the 1st SB implemented a standard brigade Microsoft Access database, the ESC SPO saw the value of visualizing and understanding an entire brigade's cargo database. He tasked the 1st SB to teach the other SBs in theater. The 1st SB, collectively, developed other distribution innovations that were not included in the since they were developed after the designated time period of this thesis October 2007 to January 2008.

A more detailed analysis of survey results can be found in Appendix C to assist the reader. The Appendix will include a matrix that explains the linkage between each survey question, associated case study, data tables, and selected survey figures. The end result is a reliable comparison between research data and survey participant perceptions.

¹PressTV, “Iraq to end Baghdad Security Plan,” 12 November 2007, <http://edition.presstv.ir/detail/30773.html> (accessed 17 January 2011).

²1st SB RCAAT, February 2009.

³Linda Robinson, *Tell Me How This Ends*, 119-124.

⁴*Army Logistician Magazine*, January 2005, 1.

⁵316 ESC, “Review and Analysis,” 17 August 2008, slide 4.

⁶FMI 4-93-2, The Sustainment Brigade.

⁷*Army Logistician Magazine*, July 2004, 5.

⁸Department of the Army, FM 100-27, *US Army/US Air Force Doctrine for Joint Airborne and Tactical Airlift Operations* (Washington, DC: Government Printing Office, 31 January 1985), Chapter 7.

⁹1st SB, “Review and Analysis Brief,” August 2008, all slides.

¹⁰*Army Logistician Magazine*, July 2009, 37.

¹¹Ibid.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter is organized into five components. A case study assessment using the Army's sustainment principles to describe the linkage between 1st SB approach and doctrine. A strategic and operational-level finding to discuss the impact of their innovations on reducing CWT. A conclusion to answer the primary and secondary questions of who and what was responsible for reducing CWT. A paragraph on relevance to frame the importance of CL IX operations on unit readiness and force protection. Finally, four recommendations to enhance future sustainment operations.

The following eight sustainment principles from Field Manual 4-0, listed below, provide valuable benchmarks to review each case study. These principles facilitate assessment of the significance of each case study and the impact each innovation or problem resolution had in reducing CWT in MND-B.

1. Integration is joining all of the elements of sustainment to operations assuring unity of purpose and effort.
2. Anticipation is the ability to foresee events and requirements and initiate necessary actions that most appropriately satisfy a response
3. Responsiveness is the ability to meet changing requirements on short notice and to rapidly sustain efforts to meet changing circumstances over time.
4. Simplicity strives to minimize the complexity of sustainment.

5. Economy means providing sustainment resources in an efficient manner to enable a commander to employ all assets to generate the greatest effect possible.
6. Survivability is the ability to protect personnel, information, infrastructure, and assets from destruction or degradation
7. Continuity is the uninterrupted provision of sustainment across all levels of war.
8. Improvisation is the ability to adapt sustainment operations to unexpected situations or circumstances affecting a mission.¹

Additionally, consideration of the applicable sustainment principles provides a look “inside the mind” of the SPO who was dealing with these problems, and how or why previous experience generated expertise and the insight to develop an effective solution.

Furthermore, these principles provided the 1st SB SPO with a mental checklist to generate questions to gain important answers. The questions he asked himself addressed six key points of information: who is responsible, what is the standard, where are the critical locations, when is sustainment required, why are things the way they are, and how effective and efficient is the process? The answers to those questions allowed the SPO to better assess, visualize, understand, and direct his support efforts.

Case Study One Assessment

Based on a deployment to OIF-2, as the 1st Infantry Division Materiel Officer. The 1st SB SPO understood the intricacies associated with CL IX flow. An example of this involved the Materiel Officer setting up the division’s multi-class supply accounts in

Kuwait. He became familiar with the theater SSA structure and the importance of their Type Address Codes (TAC addresses) to accurately direct the flow of supplies to units.

The 1st SB used four sustainment principles to develop a new CL IX flow plan which improved distribution and supply to FOB Hammer. The four principles were responsiveness, improvisation, integration, and simplicity.

A cornerstone of responsive support is delivering the right supplies, in the right quantity, at the right time, and in the right place to maintain unit Operational Tempo. The 1st SB SPO understood that a high CWT had negative impact on 3/3 IBCT's readiness. He identified multiple problems with the CL IX flow to FOB Hammer by asking the right questions. This disrupted CL IX flow was not responsive to 3/3 IBCT operational needs.

He knew something had to change and began to improvise a solution. The SPO concluded a change to the TAC 2 for FOB Hammer was required to decrease the CWT. This was accomplished by changing the freight address, from Balad, outside of MND-B to VBC, within MND-B.

This action resulted in improved integration for CL IX flow. No longer did repair parts bound for FOB Hammer have to arrive, upload, stage, and be picked up in Balad, then arrive, download, stage, upload, and be delivered from FOB Taji. Now, repair parts bound for FOB Hammer would arrive, download, stage, and be delivered from VBC.

The SPO also improved simplicity of the brigade's concept of support by shifting the distribution mission to FOB Hammer from the 1103rd CSSB at FOB Taji to the 168th BSB at VBC. As a result, all outlying FOBs were supported by the 168th BSB, all concrete barriers and external missions were executed by the 1103rd CSSB, and all VBC support missions were conducted by the 68th CSSB. This had a synergistic impact, as

each battalion would constantly improve their effectiveness and efficiency through repetition and lessons learned.

Case Study Two Assessment

Based on a deployment to OIF-2, as the 601st Aviation Support Battalion SPO. The 1st SB SPO comprehended the complexities associated with improving distribution flow. In this previous experience, the Aviation Support Battalion SPO set up nested convoys. Using organic support battalion and 1-4 Cavalry Squadron transportation assets, to double the frequency between FOB McKenzie to FOB Speicher in Multi-National Division-North, some 50 miles away. He became familiar with a technique to establish continuous distribution flow without having to greatly increase support requirements such as personnel, vehicles, and security platforms.

The 1st SB used four sustainment principles to develop a new convoy technique which improved distribution and supply from FOB Taji to Balad. The four principles were responsiveness, improvisation, integration, and economy.

Another cornerstone of responsive support is providing enhanced unit flexibility by providing support that can rapidly meet changing requirements. The 1st SB SPO understood that a three times a week frequency between FOB Taji and Balad had a negative impact on Taji based brigade readiness. He identified several distribution problems by asking the right questions. This every other day flow was not responsive to MND-B brigade operational needs, especially for short notice requirements.

He knew something had to change and began to improvise a solution. The SPO concluded that a more frequent distribution flow for FOB Taji was required, but how to do that with limited resources was a challenge. This was accomplished by integrating

organic battalion and KBR transportation assets. This action resulted in improved integration for CL IX flow. Repair parts bound for FOB Taji would now arrive almost daily from Balad.

The SPO also improved the economy of force for both the 1st SB and KBR transportation and security platform assets by integrating them. The convoy frequency basically doubled without a significant increase in additional required Soldiers, vehicles, and security. Although total volume increased marginally, the real impact was having a newfound flexibility to put a critical CL IX repair part on a convoy and have it delivered to FOB Taji within 24 to 48 hours. This had a synergistic effect as each convoy provided a rapid transportation solution for short-notice sustainment or combat missions.

Case Study Three Assessment

From previous experience as a G3 Logistics Plans Officer for the 101st Airborne Division, the 1st SB SPO recognized the challenges associated with obtaining situational awareness and maintaining a Common Operating Picture. An example of this involved the logistics plans officer conducting several military decision-making process events and staff estimates. He mastered techniques to obtain essential information, analyze data for significance, and create a product to better inform commanders so they could make the right decisions. Also, the SPO knew a consolidated database for the brigade was required to improve situational understanding, and enable better decision-making, which would result in decreased cargo transit time.

The 1st SB used five sustainment principles to develop a consolidated database to improve distribution and supply improvements throughout MND-B. The five principles were responsiveness, anticipation, simplicity, integration, and continuity.

Another cornerstone of responsive support is providing extended operational reach for units by sustaining units over time and posturing them for future missions. The 1st SB SPO understood that two separate battalion TMR and CRSP databases had a negative impact on MND-B readiness. He identified several distribution and supply problems by asking the right questions. The seven day CRSP cargo transit time and a 7.5 day average TMR Required Delivery Date time was not responsive to MND-B operational needs, especially to support the Baghdad Security Plan and future deployment of Surge brigades.

He anticipated that future sustainment requirements would increase and began to develop a solution. The SPO concluded that a single brigade database to manage TMRs and CRSP inventory was required. Selecting a single brigade database program was accomplished when he discovered the 168th BSB Microsoft Access TMR database, during one of his battlefield tours.

This action resulted in improved integration for planning, coordinating, synchronizing, and executing both TMR missions and reducing CRSP inventory. Now, the 1st SB staff and subordinate units could simultaneously see transportation and cargo mission requirements and optimize distribution and supply flow for each convoy.

The SPO also improved continuity. The new database allowed the brigade's Distribution Movement Board to more effectively and efficiently scrub multi-class cargo within MND-B and cargo scheduled to sister SBs. As a result, this significantly reduced cargo transit time to supported brigades and to ESC supply hubs. The overall distribution flow improved and friction points reduced for the 1st SB segment of the CL IX pipeline.

Strategic Level Findings

The most significant initiatives applied by strategic partners affecting CL IX CWT were enhanced distribution and supply management. These are described below.

USTRANSCOM created the Deployment Distribution Operation Center and JDDOC. These organizations had a profound impact on reducing CWT from CONUS to theater segments and portions of intra-theater segments through improved Service coordination and pipeline visibility.

The DLA created two Strategic Distribution Platforms in the U.S., established the Defense Distribution Depot in Kuwait, forward stocked critical CL IX in theater SSAs, and employed new automation such as In-Transit Visibility and Radio Frequency Identification to optimize CL IX visibility.²

The AMC implemented the Logistics Modernization Plan that improved their end-to-end distribution and supply chain and LOGSA pipeline database, to assist sustainment managers with achieving CWT and Time Definite Delivery requirements.

Collectively the actions of the national enablers assisted in reducing CWT by streamlining the supply chain, eliminating distribution friction points, and enhancing information flow to key sustainment managers. Figure 30 depicts the mean reduction in CWT for CENTCOM from October 2007 to January 2008. This four day reduction in CWT was achieved at the strategic level.

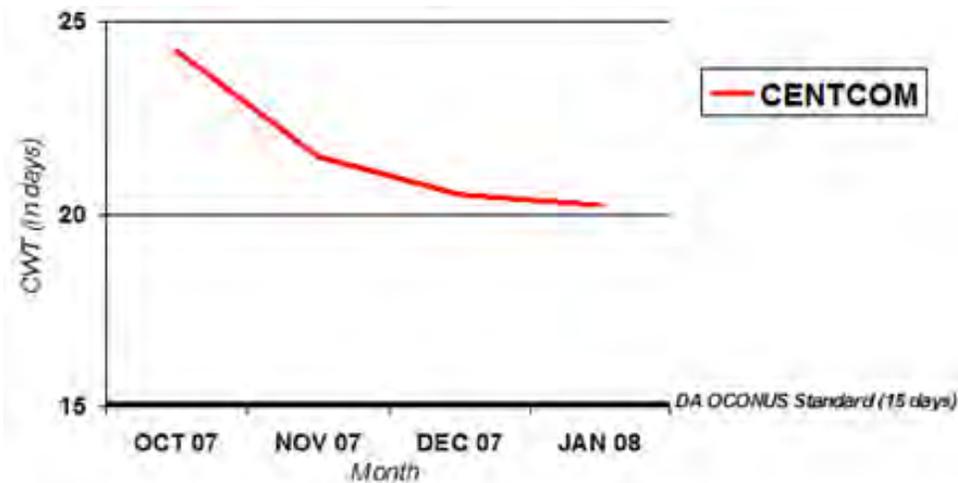


Figure 30. Department of Defense Average Customer Wait Time
Source: Defense Logistics Agency, CWT Tool Chart, <https://scitools.lmi.org> (accessed 15 December 2010). CWT Tool <https://scitools.lmi.org> (accessed August 2010). Author created.

Operational Level Findings

The 1st TSC employed several innovations that reduced the number of unscheduled convoy remain overnights by prepositioning stand-by crews or replacement vehicles at Convoy Security Companies and reduced the number of backlog and old containers in the theater holding yard. Both of these actions greatly improved distribution time for supplies to Iraq. The author could not find any definitive data that identified a direct impact to MND-B CWT. However, based on available data, one could deduce that the 1st TSC innovations had at least a one day reduction in CWT by reducing remain overnights and container backlog.

The 316th ESC turned on CL IX referrals at their Balad Forward Reissue Point in August 2007, resulting in over 121,000 transactions through January 2008. Turning on CL IX referrals allowed any unfilled requisition supported by a SB SSA to pass to the

ESC Forward Reissue Point first. If the part was on hand at the Forward Reissue Point, the requisition would be filled. Thus, CWT was reduced since the requisition would not have to pass to a higher source, like CONUS, to be filled.

In November 2007, the ESC initiated CL IX referrals between all the sustainment brigades SSAs resulting in a further 20,000 referrals during the same time period. Based on their R&A data this resulted in a one day improvement in CWT within the ESC SSAs. A conclusion could be drawn that this one day improvement was also carried to MND-B customer units supported by the 1st SB SSAs located at FOB Taji and VBC.

Collectively, the actions of the above operational commands reduced CWT by streamlining the supply chain through CL IX referrals and eliminating friction points through a hub-and-spoke distribution concept. Figure 31 depicts the mean reduction in CWT for the 316th ESC from October 2007 to January 2008. This two day reduction in CWT was achieved at the operational level, above the 1st SB.

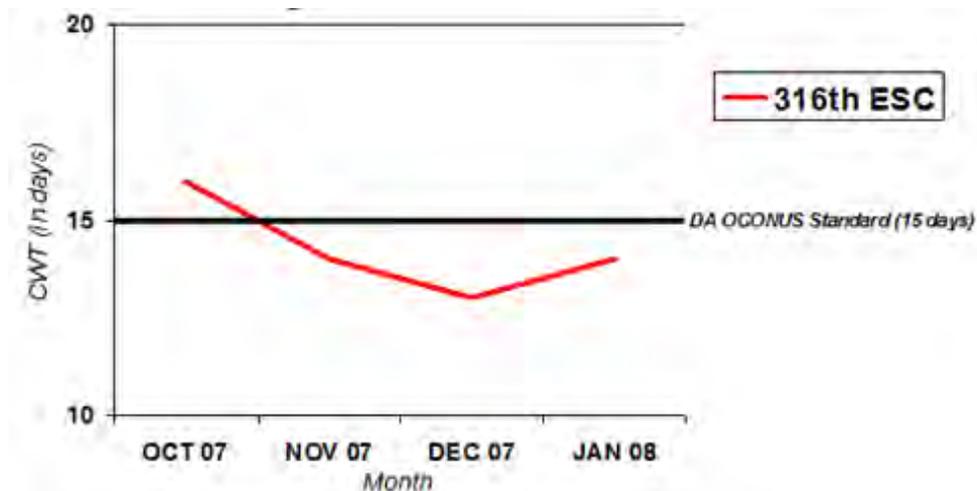


Figure 31. 316th Expeditionary Support Command Average Customer Wait Time
Source: 316th ESC, "Review and Analysis" (Brief, Balad, Iraq, 17 August 2008). Author created.

The 1st SB applied several innovations, as discussed in the three case studies that optimized distribution and supply operations. Implementing nested CLPs, such as the Taji Express, reduced CWT by one day, as distribution improved from alternate days to daily delivery between Balad and Taji. Moreover, creating a single brigade TMR and CRSP database reduced cargo transit time by five days through enhanced distribution and cargo inventory management.

Conclusion

The new business enterprises executed by the strategic enablers, initiatives by theater operational commands, and innovations of the 1st SB had a net effect of reducing CWT in MND-B by 4 days, 2 days, and 6 days, respectively. One day was unaccounted for, but could be attributed to a tactical unit innovation that was not investigated in the scope of this thesis. This net effect culminated in an overall reduction of 54 percent in CWT, from 24 days to 11 days, between October 2007 and January 2008. Consequently, it was not just the 1st SB that reduced CWT in MND-B. The reduction in MND-B CWT was a team effort accomplished throughout the strategic and operational segments, and possibly the tactical segment, of the CL IX distribution and supply pipeline.

Relevance

Although CL IX distribution was not a top priority for MNC-I, the importance of enhancing CL IX operations was not diminished. Having the right repair parts, at the right time, and in the right place enables unit readiness and force protection. A simple bolt could mean the difference between a Soldier operating a tank or having to use an

armored wheeled vehicle to conduct their mission. Given the current improvised explosive device threat, effective and efficient CL IX distribution can save a Soldiers life.

Recommendations

1. Modify Army sustainment doctrine to include the requirement to establish a consolidated sustainment brigade database for TMR missions and CRSP inventory.

2. Modify the Army's Battle Command Sustainment Support System to provide a standard and consolidated unit TMR and CRSP SSA database.

3. A follow-on thesis to investigate what BSB Tactical Level innovations or problem solutions were implemented that might have also reduced CWT in MND-B.

4. A follow-on thesis to explore case studies on 1103rd CSSB use of trailer transfer points for local haul operations, 1103rd CSSB concrete barrier delivery techniques for Baghdad, and the 168th BSB FOB distribution group method to FOBs around Baghdad.

¹Department of the Army, FM 4-0, 1-2 to 1-3.

²Defense Logistics Agency, "BRAC Brief," 9 April 2008, <http://www.dla.mil/j-6/dlmso> (accessed 27 February 2011).

APPENDIX A

IRB APPROVAL

Approved by Dr. Morris P. Peterson, HQDA ARI, on 19 July 2010. IRB approval was in the form of an email sent to Ms Maria L. Clark, CGSC QAO on the same date. The email stated the thesis was an ~~academic~~ project and there were no objections to the author conducting research in the form of a series of questions. Additionally, no control number was provided by ARI.

Dr. Peterson's contact information is:

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2530 Crystal Drive (Taylor Building, 4th Floor)
Arlington, VA 22202-3926

APPENDIX B

SURVEY QUESTIONNAIRE

1. Why was the 15-day DA standard for CL IX customer wait time (CWT) not achieved in MND-B from Aug to Dec 2007? Check and rate all that apply.

Check all that apply	Possible Problem Areas	Rating (1 = low, 5 = high)
	Distribution frequency from JBB to FOB Taji BCTs	
	Distribution frequency from VBC to BCT FOBs	
	Available drivers in your unit	
	Available cargo transport platforms in your unit	
	Available security platforms in your unit	
	Availability of dedicated MHE at SSAs	
	Availability of dedicated MHE at CRSP yards	
	Lack of Trailer Transfer Points at key sustainment HUBs	
	Lack of a brigade CRSP database	
	Locations of supported unit FOBs, JSSs, or COPs	
	MNC-I CLP window policy	
	Other:	

2. What CSSB or BSB innovations were implemented from Oct 07 to Jan 08 to reduced CWT by 50% in MND-B? Fill in and rate your reply.

Check all that apply	Innovations that improved CWT from Oct 07 to Jan 08	Rating (1 = low, 5 = high)
	LOGCAP contract for TTM	
	LOGCAP contract for CLS	
	Other:	

3. What aspects of 15th SB's concept of support negatively impacted CL IX distribution operations in MND-B from Aug to Oct 07? Fill in and rate your reply.

Check all that apply	Aspects that negatively impacted CWT from Aug to Oct 07	Rating (1 = low, 5 = high)
	Consolidated BCT SSA at FOB Taji	
	Other:	

4. What 1st SB innovations implemented from Oct 07 to Jan 08 reduced CWT by 50% in MND-B? Check and rate all that apply.

Check all that apply	Innovations that improved CWT from Oct 07 to Jan 08	Rating (1 = low, 5 = high)
	FOB Hammer TAC2 change from Balad to Baghdad	
	Remission 1103rd CSSB to only BCT concrete missions and ESC missions	
	Remission 168 BSB to only BCT FOB distribution missions	
	Remission 68 CSSB to only VBC distribution and A/DACG missions	
	Nested CLPs from Balad to FOB Taji	
	Standard CRSP database	
	FOB group distribution technique (168 BSB to BCT FOBs)	
	Other:	

5. What 316th ESC innovations implemented from Oct 07 to Jan 08 improved CL IX distribution and reduced overall CWT in MNC-I? Check and rate all that apply.

Check all that apply	Innovations that improved CWT from Oct 07 to Jan 08	Rating (1 = low, 5 = high)
	Hub and Spoke concept for cargo distribution	
	CL IX referrals within ESC SSAs	
	Improved use of fixed wing channel flights	
	Forward Reissue Point (FRP) at JBB	
	Other:	

6. What AMC or DLA innovations implemented from Jun 07 to Jan 08 improved CL IX distribution and reduced overall CWT in MNC-I? Fill in and rate all that apply.

Check all that apply	Innovations that improved CWT from Oct 07 to Jan 08	Rating (1 = low, 5 = high)
	Pure packaging for customer units	
	Other:	

7. Please add any other internal or external problems that affected your unit CWT and rate them IAW the table.

Your Input	Internal or external problems that affected your unit CWT	Rating (1 = low, 5 = high)

APPENDIX C

SURVEY DATA ANALYSIS

This appendix includes a matrix that explains the linkage between survey questions, case studies, data tables, and selected figures. Survey questions 1-3 were not evaluated because the scope of the thesis was reduced. The scope was limited to only operational-level units and above and a time period from October 2007 to January 2008. Moreover, there was insignificant survey participant response for survey question 5, TSC and ESC innovations, and so no data table was created. Finally, question 7, individual responses, were rolled into the appropriate narrative for tables 1-5.

Figure (s)	19-21	22-25	26-29	13	11	12
App C Table	1	2	3	no data	4	5
Case Study	1 (TAC2)	2 (CLP)	3 (CRSP)	n/a	n/a	n/a
Question	4 (1SB)	4 (1SB)	4 (1SB)	5 (ESC)	6 (DLA)	6 (AMC)

Twelve of the 16 key participants responded to the survey. This was an overall response rate of 75 percent and resulted in a reliable baseline for data comparison. Their responses provided an unbiased assessment of the significance of 1st SB, theater, or national innovations contributing to the reduction of CWT in MND-B from October 2007 to January 2008. The following tables below depict select responses from each of the seven questions since they relate to the three case studies in chapter 4.

Table 1 provides a comparison of responses to the effectiveness of changing the TAC 2 (freight shipping address) from JBB to VBC. The results show that over 83.3 percent of the respondents felt this innovation had a slightly to high effectiveness. This innovation is addressed in the first case study in chapter 4.

Table 1. Survey Question: FOB Hammer TAC-2 Change from JBB to VBC				
Responses	<i>Not effective</i>	<i>Slightly effective</i>	<i>Mostly effective</i>	<i>Highly effective</i>
#	2	4	3	3

Several participants responded to this question. The consensus was that CL IX would stay for several days at Balad waiting for rotary or ground distribution.

Table 2 provides a comparison of responses to the effectiveness of implementing the nested CLPs from JBB to FOB Taji. This question is related to the 1st SB innovation of nested convoys.

Table 2. Survey Question: Nested CLPs fro JBB to FOB Taji "Taji-Express"				
Responses	<i>Not effective</i>	<i>Slightly effective</i>	<i>Mostly effective</i>	<i>Highly effective</i>
#	1	2	5	4

The results show that over 91.6 percent of the respondents felt this innovation had a slightly to high effectiveness. This innovation is addressed in the second case study in chapter 4. A few participants responded to this question. They agreed that placing 1st SB LNOs at Balad significantly improved download, upload, and distribution of cargo from JBB to Taji or VBC.

Table 3 provides a comparison of responses to the effectiveness of increasing distribution frequency from 1st SB CRSP yards to VBC. This question is related to the 1st SB innovation of nested convoys.

Table 3. Survey Question: A single consolidated brigade CRSP database				
Responses	<i>Not effective</i>	<i>Slightly effective</i>	<i>Mostly effective</i>	<i>Highly effective</i>
#	1	3	7	1

The results show that over 91.6 percent of the respondents felt this innovation had a slightly to high effectiveness. This innovation is addressed in the third case study in

chapter 4. A participant responded to this question. They stated the CRSP improvements resulted in a 4 to 5 day decrease in cargo transit time.

Table 4 provides a comparison of responses to the effectiveness of CL IX pure packing for customers. This question is related to DLA's innovation at the SDPs and other distribution platforms.

Table 4. Survey Question: Pure packing process for customer units				
Responses	<i>Not effective</i>	<i>Slightly effective</i>	<i>Mostly effective</i>	<i>Highly effective</i>
#	5	3	2	2

The results show that over 75 percent of the respondents felt this innovation had a slightly to high effectiveness. This innovation is further discussed in the strategic findings in chapter 5. A participant responded to this question. They affirmed that unit pure-packing of multi-class supplies enabled faster distribution of repair parts.

Table 5 provides a comparison of responses to the effectiveness of Army Field Support Brigades. This question is related to AMC's innovation with providing them to support theater missions.

Table 5. Survey Question: Army Field Support Brigades in Iraq and Kuwait				
Responses	<i>Not effective</i>	<i>Slightly effective</i>	<i>Mostly effective</i>	<i>Highly effective</i>
#	4	3	4	1

The results show that over 75 percent of the respondents felt this innovation had a slightly to high effectiveness. This innovation is further discussed in the strategic findings in chapter 5. A participant responded to this question. They stated there was a small benefit to CWT, but a larger benefit was to readiness from weapon system or vehicle replacements.

BIBLIOGRAPHY

Books

- Cohen, Shoshanah, and Joseph Rousell. *Strategic Supply Chain Management: The 5 Disciplines for Top Performance*. New York: The McGraw-Hill Companies, Inc., 2005.
- Peltz, Eric, and Marc Robbins. *Leveraging Complementary Distribution Channels for an Effective, Efficient Global Supply Chain*, Santa Monica, CA: RAND, 2007. http://www.rand.org/pubs/documented_briefings/2007/RAND_DB515.pdf (accessed 16 January 2011).
- Peltz, Eric, Marc L. Robbins, Kenneth J. Girardini, Rick Eden, John M. Halliday, and Jeffrey Angers. *Sustainment of Army Forces in Operation Iraqi Freedom*. Santa Monica, CA: RAND, 2005.
- Robinson, Linda. *Tell Me How This Ends*. Philadelphia, PA: Perseus Books Group, 2008.
- Turabian, Kate L. *A Manual for Writers*. 7th ed. Chicago: University of Chicago Press, 2007.
- U.S. Army. Command and General Staff College. ST 20-10, *Master of Military Art and Science (MMAS) Research and Thesis*. Ft. Leavenworth, KS: Government Printing Office, July. 2003.
- Wang, Mark Y.D. *Accelerated Logistics: Streamlining the Army's Supply Chain*. Santa Monica, CA: RAND, 2000.

Reverse-Collection and Analysis Team (RCAAT) Program

- Anderson, Brigadier General Steve. –MNC-I.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, March 2008.
- Couch, Brigadier General Gregory E. –316th ESC.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2008. <http://www.cascom.army.mil> (accessed August 2010).
- Gross, Colonel and Colonel Wilcox. –3th TSC.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, October 2007.
- O’Conner Colonel Jack. –402d AfSB.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, June 2007.

O'Connell, Colonel Kevin G. –1st SB.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, February 2009.

Piggee, Colonel Aundre F. –45th SB.” Fort Lee, Virginia, U.S. Army Combined Arms Support Command, December 2007.

PowerPoint Presentations

1st SB. –Concept of Support Brief.” PowerPoint slide Presentation to BG Couch, 1st SB Support Operations, Camp Taji, Iraq, 11 November 2007.

———. –Concept of Support Brief.” PowerPoint slide Presentation to GEN Griffin, 1st SB Support Operations, Camp Taji, Iraq, 12 January 2008.

———. –Distribution Synergy Brief.” PowerPoint slides, 1st SB Support Operations, Camp Taji, Iraq, 2 March 2008.

———. –Review and Analysis Brief.” PowerPoint slides, 1st SB Support Operations, Camp Taji, Iraq, 28 February 2008.

316th ESC. –Concept of Support Brief.” PowerPoint slides, 316th Support Operations, Balad, Iraq, 28 May 2007.

———. –Review and Analysis Brief.” PowerPoint slides, 316th Support Operations, Balad, Iraq, 17 August 2008.

CDDOC. CDDOC Brief, Arifjan, Kuwait, 2005.

Defense Logistics Agency. –DLA Supply Process Review Brief,” 9 April 2008.
<http://www.dla.mil/j-6/dlmsa/archives/supply> (accessed 27 February 2011).

–Logistics Modularity Do We Have it Right Brief.” AUSA Logistics Symposium, Richmond, Virginia, 14 May 2008.

MNC-I. –LTG Odierno Surge Brief.” Balad Iraq, 17 January 2008.
http://theredhunter.com/2008/01/iraq_briefing_17_january_2008_ltg_ray_odierno.php (accessed 17 January 2011).

United States Transportation Command. –DPO The Fundamentals Brief.” 2010.
http://www/transcom.mil/dpo_briefing (accessed 15 January 2011).

Journals

Ames, Rear Admiral Christopher C. 2004. –Distribution Process Owner Initiatives Are Underway.” *Army Logistician* (May-June 2004): 44-45.

- Bauxbaum, Peter A. –Government Agencies Partner to Streamline Warfighter Supply Operations.” *Military Logistics Forum* 3, no. 4 (2009): 1-5.
- Carroll, Kevin, and Colonel David W. Coker. –Logistics Modernization Program: A Cornerstone of Army Transformation.” *Army Logistician* (January-February 2007): 11-15.
- Cholek, Colonel Brandon C., and Chief Warrant Officer 5 Matthew A. Anderson. –Distribution-Based Logistics in Operation Iraqi Freedom.” *Army Logistician* (March-April 2007): 2-8.
- Dail, Lieutenant General Robert T. –Directors Message.” *DLA’s Strategic Plan FY07-FY13* (2007): 1-14.
- Dail, Lieutenant General Robert T., and Lieutenant Colonel David E. Jones. –Deployment and Distribution Command and Control.” *Army Logistician* (January-February 2007): 2-7.
- Engles, Daniel W., Robin Koch, Elain M. Lai, and Edmund W. Shuster. –Improving Visibility in the DoD Supply Chain.” *Army Logistician* (May-June 2004): 20-23.
- Fontaine, Brigadier General Yves J., and Major Donald K. Wols. –Sustaining the Momentum: The 1st Corps Support Command in Iraq.” *Army Logistician* (March-April 2006): 3-8.
- Gibson, David R. –Average Customer Wait Time: A Supply Chain Performance Indicator.” *Army Logistician* (November-December 2004): 30-32.
- Gibson, Major David R. –An Eight-Step Process for Improving Logistics Activities.” *Army Logistician* (September-October, 2005): 30-35.
- . –Applying Lean Principles to Design Effective Supply Chains.” *Army Logistician* (July-August 2007): 44-48.
- Hardy, Major Aaron. –Distribution is the Center of Gravity for Success.” *Army Logistician* (September-October 2007): 18-19.
- Herndon, Major Archie S. –The Sustainment Brigade General Supply Office in Iraq.” *Army Logistician* (September-October 2007): 36-37.
- Heussner, Lieutenant Colonel Todd A. –Executing Offensive Logistics.” *Army Logistician* (July-August 2009): 24-26.
- Johnson, Nadine S., Chief Warrant Officer 2. –Providing Checks and Balances at the CRSP.” 1st SB SPO Deployment Files, Fort Riley, Kansas, October 2008.

- . —Technology and Daily Management Help CRSPs Move Cargo.” *Army Logistician* (July-August 2009): 36-37.
- LaFalce, John T. —AMC Repair Parts Supply Chain.” *Army Logistician* (May-June 2009): 2-7.
- LaJoie, First Lieutenant Bart S. —Operating a Central Receiving and Shipping Point.” *Army Logistician* (May-June 2007): 24-28.
- Lippert, Vice Admiral Keith W. —Directors Foreword.” *DLA's FY 2006 Transformation Roadmap* (2007): 1-44.
- Logistics Management Institute. —Current DoD Supply Chain Performance Measures.” *LMI's Supply Chain Management: A Recommended Performance Measurement Scorecard* (1999): 2-2 to 3-4.
- Mann, Captain Robert P. —Improving Intratheater Joint Distribution.” *Army Logistician* (May-June 2004): 3-5.
- Melendez, Lieutenant Colonel Michael D. —Using Central Receiving and Shipping Points to Manage Transportation.” *Army Logistician* (November-December 2007): 3-5.
- Montero, Commander Eddie. —Breaking Paradigms: CENTCOM DDOC's Revolution in Deployment and Distribution.” *Army Logistician* (January-February 2007): 8-10.
- Peltz, Eric. —Logistics: Supply Based or Distribution Based?” *Army Logistician* (March-April 2007): 9-11.
- Pigee, Colonel Aundre F. —The 15th Sustainment Brigade in Iraq.” *Army Logistician* (September-October 2007): 10-12.
- RAND. *CWT and RWT Metrics Measure the Performance of the Army's Logistics Chain for Repair Parts*. Santa Monica, CA: RAND, 2003. http://www.rand.org/pubs/research_briefs/RB3035.html (accessed 16 January 2011).
- Valles-Rosales, Dr. Delia, and MAJ Donovan O. Fuqua. —Optimizing Logistics Through Operations Research.” *Army Logistician* (January-February 2007): 49-51.

Government Documents

- CDDOC. —365-day Report.” Arifjan, Kuwait, 2004.
- Defense Logistics Agency. *Delivery Services Guide*. Washington, DC: Department of Defense Printing Office, May 2007. <http://www.dla.mil/j-4/cric/DeliveryServiceGuide.asp> (accessed 10 October 2010).

- . *Material Release Order Process Guide*. Washington, DC: Department of Defense Printing Office, May 2007. <http://www.dla.mil/j-4/cric/DeliveryServicesGuide.asp> (accessed 20 February 2011).
- Department of the Army. Army Regulation (AR) 711-2, *Army Distribution Management*, Washington, DC: Government Printing Office, 2004.
- . Army Regulation (AR) 711-7, *Supply Chain Management*, Washington, DC: Government Printing Office, 2004.
- . Army Regulation (AR) 725-50, *Requisitioning, Receipt, and Issue System*, Washington, DC: Government Printing Office, 1995.
- . Army Regulation (AR) 740-1, *Storage and Supply Activity Operations*, Washington, DC: Government Printing Office, 2008.
- . Field Manual (FM) 4-0, *Sustainment*. Washington, DC: Government Printing Office, 2009.
- . Field Manual (FM) 4-01.30, *Movement Control*. Washington, DC: Government Printing Office, 2003.
- . Field Manual (FM) 4-94, *Theater Sustainment Command*. Washington, DC: Government Printing Office, 2010.
- . Field Manual (FM) 55-1, *Transportation Operations*. Washington, DC: Government Printing Office, 1995.
- . Field Manual (FM) 100-10-1, *Theater Distribution*. Washington, DC: Government Printing Office, 1999.
- . Field Manual Interim (FMI) 4-93.2, *The Sustainment Brigade*. Washington, DC: Government Printing Office, 2009.
- . Field Manual Interim (FMI) 4-93.41, *Army Field Support Brigade Tactics, Techniques, and Procedures*. Washington, DC: Government Printing Office, 2007.
- Department of Defense. Department of Defense Instruction 4140.61, *Customer Wait Time and Time Definite Delivery*. Washington, DC: Department of Defense, December 2000.
- . Department of Defense Directive 5158.04, *United States Transportation Command (USTRANSCOM)*. Washington, DC: Department of Defense, July 2007.

———. Department of Defense Instruction 5158.06, *Distribution Process Owner (DPO)*. Washington, DC: Department of Defense, July 2007.

Joint Chiefs of Staff. Joint Publication (JP) 4-0, *Joint Logistics*. Washington, DC: Government Printing Office, 2008.

———. Joint Publication (JP) 4-09, *Distribution Operations*. Washington, DC: Government Printing Office. 2010.

United States Transportation Command, *USTRANSCOM 2007 Annual Report* (Scott AFB, IL: Government Printing Office, 2007).

———. “Inside USTRANSCOM.” www.transcom.mil (accessed 10 April 2011).

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