

PERFORMANCE-BASED LOGISTICS, CONTRACTOR  
LOGISTICS SUPPORT, AND STRYKER

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

MASTER OF MILITARY ART AND SCIENCE  
General Studies

by

BRENT D.CORYELL MAJ, USA  
M.S., Florida Institute of Technology, Melbourne, Florida, 2004

Fort Leavenworth, Kansas  
2007

Approved for public release; distribution is unlimited.

# REPORT DOCUMENTATION PAGE

*Form Approved*  
*OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.**

<b>1. REPORT DATE (DD-MM-YYYY)</b> 15-06-2007			<b>2. REPORT TYPE</b> Master's Thesis		<b>3. DATES COVERED (From - To)</b> Aug 2006 - Jun 2007	
<b>4. TITLE AND SUBTITLE</b> Performance-Based Logistics, Contractor Logistics Support, and Stryker					<b>5a. CONTRACT NUMBER</b>	
					<b>5b. GRANT NUMBER</b>	
					<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b>  MAJ Brent D. Coryell					<b>5d. PROJECT NUMBER</b>	
					<b>5e. TASK NUMBER</b>	
					<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD 1 Reynolds Ave. Ft. Leavenworth, KS 66027-1352					<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b>					<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
					<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b>  Approved for public release; distribution is unlimited.						
<b>13. SUPPLEMENTARY NOTES</b>						
<b>14. ABSTRACT</b> The study takes a comprehensive look at the reasons behind the recent Army decision to transfer the Stryker from contractor logistics support (CLS) to organic (Soldier) sustainment support. Using a case study approach with the Stryker, the thesis discusses the challenges with PBL and CLS. Specifically it addresses: funding integration, culture change, stovepipes in supply and maintenance activities, and government access to technical and demand data. The study also takes a look at the challenges associated with the transition to organic support and explores the notion of an organic PBL. The study takes on the issue of PBL being DOD's preferred sustainment strategy, and how it appears to be in direct conflict with the Army's recent sustainment decisions for Stryker. The research identifies the benefits, challenges, and lessons learned from the Stryker CLS support strategy, so that the Army can apply them to other PBL arrangements in the future.						
<b>15. SUBJECT TERMS</b>						
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>	<b>18. NUMBER OF PAGES</b>	<b>19a. NAME OF RESPONSIBLE PERSON</b>	
<b>a. REPORT</b> Unclassified	<b>b. ABSTRACT</b> Unclassified	<b>c. THIS PAGE</b> Unclassified			UU	109

MASTER OF MILITARY ART AND SCIENCE  
THESIS APPROVAL PAGE

Name of Candidate: MAJ Brent D. Coryell

Thesis Title: Performance-Based Logistics, Contractor Logistics Support, and Stryker

Approved by:

\_\_\_\_\_, Thesis Committee Chair  
Ralph O. Doughty, Ph.D.

\_\_\_\_\_, Member  
LTC Roger J. Linder, B.A.

\_\_\_\_\_, Member  
LTC James L. Henderson, M.S.

Accepted this 15th day of June 2007 by:

\_\_\_\_\_, Director, Graduate Degree Programs  
Robert F. Baumann, Ph.D.

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.

## ABSTRACT

PERFORMANCE-BASED LOGISTICS, CONTRACTOR LOGISTICS SUPPORT,  
AND STRYKER by MAJ Brent D. Coryell, 111 pages.

The study takes a comprehensive look at the reasons behind the recent Army decision to transfer the Stryker from contractor logistics support (CLS) to organic (Soldier) sustainment support. Using a case study approach with the Stryker, the thesis discusses the challenges with PBL and CLS. Specifically it addresses: funding integration, culture change, stovepipes in supply and maintenance activities, and government access to technical and demand data. The study also takes a look at the challenges associated with the transition to organic support and explores the notion of an organic PBL. The study takes on the issue of PBL being DOD's preferred sustainment strategy, and how it appears to be in direct conflict with the Army's recent sustainment decisions for Stryker. The research identifies the benefits, challenges, and lessons learned from the Stryker CLS support strategy, so that the Army can apply them to other PBL arrangements in the future.

Both primary and secondary data were obtained and analyzed for this thesis. Primary data was obtained through questioning experts engaged in Stryker PBL/CLS activities in different agencies throughout the Army. Secondary data was obtained from previous studies, issued policy, and published guidebooks on PBL implementation.

## ACKNOWLEDGMENTS

The chair of the thesis committee was Dr. Ralph Doughty. The Author wishes to express sincere appreciation to Dr. Doughty for his guidance in the preparation of this manuscript. The Author also wishes to express sincere thanks to Mr. Jack Dugan, and Mr. Kevin Fahey, for their motivation and advice in suggesting this thesis topic.

Jack Dugan is the TACOM Life Cycle Management Command Deputy to the Commander. Mr Dugan was the one that suggested this research topic via the following note:

Now that the decision was made to integrate the Stryker into STAMIS and leverage the AWCF a good topic would be integrating PBL and CLS into the army standard systems and financial processes. An excursion to research would be does full funding of PBL/CLS initiatives with OPTEMPO dollars give the army sufficient flexibility to manage resources during times of constrained funding. Another excursion is system level versus component level PBL/CLS.



Kevin Fahey is the Program Executive Officer for Ground Combat Systems (PEO-GCS). Mr Fahey was a second motivator for taking on this topic. He sent the researcher the following note:

I think it would be great research to evaluate what the impediments were in establishing a system level PBL, and can the Army really execute PBL's without significant changes in the Army. This is timely because if we are about transition Stryker to the organic system. What could we have done better, and what can we do better in the future?



# TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
ACKNOWLEDGMENTS .....	iv
ACRONYMS.....	viii
ILLUSTRATIONS .....	xi
CHAPTER 1. INTRODUCTION .....	1
Problem Statement.....	1
Purpose.....	3
Thesis Question.....	4
Background on Performance-Based Logistics.....	5
Background on Stryker Contractor Logistics Support.....	7
Assumptions.....	8
Limitations .....	8
Scope.....	9
Delimitations.....	9
Significance of the Study.....	10
CHAPTER 2. LITERATURE REVIEW .....	12
Introduction.....	12
Part I: Performance Based Logistics Literature Review.....	12
Performance-Based Logistics Publications.....	12
Performance Based Logistics History Timeline .....	14
Performance Based Logistics Overarching Strategies .....	16
Focused Logistics.....	16
Force Centric Logistics Enterprise.....	17
Total Life Cycle Systems Management.....	17
Definitions of Performance-Based Logistics .....	19
Benefits of Performance Based Logistics .....	20
Spectrum of Performance Based Logistics Arrangements .....	21
Program Manager Roles and Responsibilities .....	22
Characteristics of Performance-Based Logistics .....	23
Business Case Analysis.....	24
Product Support Integrator.....	24
Performance-Based Agreements.....	25
Performance Metrics.....	27
Incentives for Product Support Providers .....	28
Part II: Stryker Literature Review .....	29

Stryker Publications .....	29
Stryker Timeline .....	30
The Chief of Staff of the Army Vision .....	33
The Interim Armored Vehicle.....	35
From Interim to Stryker .....	36
The Stryker Organizational and Operational Concept.....	36
Stryker Family of Vehicles .....	37
Vehicle Performance Highlights.....	38
Sustainment Strategy for Stryker Vehicles .....	39
Sustainment Strategy for vehicles and equipment other than Stryker .....	42
The Brigade Support Battalion .....	43
The Forward Maintenance Company.....	44
The Combat Repair Team .....	47
The Logistics Support Element Forward .....	48
Army Material Commands Forward Stryker .....	49
General Dynamics.....	50
CHAPTER 3. METHODOLOGY .....	56
Agencies to be Contacted .....	56
Assistant Secretary of Army, Acquisition, Logistics and Technology .....	56
Army Material Command .....	57
TACOM Life Cycle Management Command.....	57
Program Executive Office Ground Combat Systems .....	57
Program Manager Stryker Brigade Combat Team .....	58
Defense Acquisition University .....	58
Current and Former Stryker Commanders.....	58
Current and Former Stryker Logisticians .....	58
Questions to ask the Subject Matter Experts .....	59
CHAPTER 4. ANALYSIS.....	61
Introduction.....	61
The Army’s Reason for the Support Strategy Change .....	61
Cost of Contractor Logistics Support was not the Primary Reason.....	62
Business Case Analysis Results.....	62
Part I: Stryker Contractor Logistics Support Challenges.....	64
Financial Integration Challenges .....	65
Lack of a Performance Based Logistics Financial Policy .....	65
Different Colors of Money.....	66
Army Working Capital Fund Challenges .....	68
Expiration of Funds.....	70
Flexibility Challenges .....	70
Increased Contractor on the Battlefield Presence .....	70
Government Access to Technical and Demand Data .....	71
Stovepipes in Supply and Maintenance Activities.....	72

Culture Change Challenges.....	75
Part II: Transition to Organic Support Challenges .....	76
Organic Performance Based Logistics.....	76
Training and Maintaining Soldiers .....	78
Transition Effect on the Requirement of Deployment Speed.....	80
 CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS .....	 85
Conclusion 1. The Most Successful Performance Based Logistics Arrangements are Primarily Contractor Logistics Supported .....	85
Conclusion 1 Recommendation .....	86
Conclusion 2. The Current Stryker Contractor Logistics Support Contract is a Successful Performance Based Logistics Arrangement .....	86
Conclusion 2 Recommendation .....	87
Conclusion 3: The Future of Performance-Based Logistics and Contractor Logistics Support for Ground Combat Systems is Promising.....	87
Conclusion 3 Recommendation .....	89
Conclusion 5. Performance Based Logistics and Contractor Logistics Support Arrangements Require Better Financial Integration and Funds Management .....	90
Conclusion 5 Recommendation .....	90
Conclusion 6. Contractors should not be mandated to use the Army Standard Information Systems .....	91
Conclusion 6 Recommendation .....	91
Conclusion 7. The Army Needs an Improved Contractor on the Battlefield Policy ....	92
Conclusion 8. Culture Change is needed for any Successful Performance-Based Logistics or Contractor Logistics Support Arrangement.....	92
Conclusion 8 Recommendation .....	93
Executive Summary of Conclusions.....	93
 BIBLIOGRAPHY.....	 94
 INITIAL DISTRIBUTION LIST .....	 96
 CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT .....	 97



## ACRONYMS

ACP	Army Cost Position
AMC	Army Material Command
ASC	Army Sustainment Command
ASI	Additional Skill Identifier
ASL	Authorized Stockage List
ASR	Acquisition Strategy Report
AWCF	Army Working Capitol Fund
BCA	Business Case Analysis
BDAR	Battle Damage Assessment and Repair
BSB	Brigade Support Battalion
CASCOM	Combined Arms Support Command
CLS	Contractor Logistics Support
CLINS	Contract Line Item Numbers
COE	Contemporary Operating Environment
CRT	Combat Repair Team
C4ISR	Command, Control, Communications, Computers, and Information
DAU	Defense Acquisition University
DLR	Depot Level Repairable
DMIS	Defense Management Information System
DODAAC	Department of Defense Activity Address Code
DS	Direct Support
EAB	Echelon Above Brigade
EDC	European Distribution Center

FBCB2	Force Battle Command Brigade and Below
FCS	Future Combat Systems
FLE	Force Centric Logistics Enterprise
FOB	Forward Operating Base
FOUO	For Official Use Only
FRA	Forward Repair Activity
FRT	Forward Repair Team
GBL	Government Bills of Lading
GDLS	General Dynamics Land Systems
GOCO	Government Owned Contractor Operated
HRC	Human Resource Command
IETM	Interactive Electronic Technical Manuals
JRTC	Joint Readiness Training Center
KPP	Key Performance Parameter
LARS	Logistics Assistance Representatives
LRAS3	Long-Range Advance Scout Surveillance System
LRU	Line Replaceable Unit
LSE-F	The Logistics Support Element Forward
MARC	Maintenance Allocation Requirements Criteria
MOG	Maximum on Ground
MRO	Materiel Release Order
NET	New Equipment Training
OIF	Operation Iraqi Freedom
O&O	Organization and Operational Concept
OMA	Operations and Maintenance Appropriation

ORR	Operational Readiness Rate
PA	Procurement Appropriation
PBL	Performance Based Logistics
PBA	Performance Based Agreements
PLL	Prescribed Load List
PMCS	Preventative Maintenance Checks and Services
PM	Project Manager
POC	Point of Contact
POI	Program of Instruction
POL	Petroleum Oils and Lubricants
PSI	Product Support Integrator
QDR	Quadrennial Defense Review
RFID	Radio Frequency Identification
SBCT	Stryker Brigade Combat Team
SPO	Support Operations Officer
STAMIS	Standard Army Management Information Systems
SME	Subject Matter Expert
TLSCM	Total Life Cycle Systems Management
TMDE	Test Measurement and Diagnostic Equipment
TRM	Training Resource Model
UAV	Unmanned Aerial Vehicle
ULLS-G	Unit Level Logistics System – Ground

## ILLUSTRATIONS

	Page
Figure 1. Stryker Operational Readiness Rates under Contractor Logistics Support .....	3
Figure 2. Total Life Cycle Systems Management.....	18
Figure 3. Spectrum of Performance-Based Logistics Strategies.....	22
Figure 4. Army Performance Based Logistics Model.....	23
Figure 5. The Product Support Integrator .....	25
Figure 6. Performance-Based Agreements.....	27
Figure 7. General Eric Shinseki .....	34
Figure 8. Stryker Acquisition Senior Officials.....	35
Figure 9. Stryker Family of Vehicles .....	38
Figure 10. Stryker Supply Support.....	41
Figure 11. The Brigade Support Battalion .....	43
Figure 12. The Forward Maintenance Company.....	45
Figure 13. Logistics Support Element Forward .....	48
Figure 14. Army Material Command Forward Stryker.....	50
Figure 15. Business Case Analysis Results.....	63
Figure 16. Stryker Supply Shipping Methods .....	73
Figure 17. Organizational Culture Change.....	76
Figure 18. Soldier Transition Plan .....	79
Figure 19. Deployment Speeds among Light, Stryker, and Heavy Brigades.....	81
Figure 20. C-17 Load with 3 Strykers, 36 Personnel, and Associated Combat Loads .....	82
Figure 21. Taking Candy from a Baby.....	87

## CHAPTER 1

### INTRODUCTION

The Department of Defense (DOD) has determined that performance-based logistics (PBL) is the preferred approach for executing product support in the armed services.<sup>1</sup> PBL means different things to different people, but principally it is defined as establishing a contract or agreement with a logistics provider for a specified level of performance for an item at a system, subsystem, or component level. This level of performance can be achieved by a contractor, the government, or a combination of both. In the case of a contractor only, it is called contractor logistics support (CLS).

There are numerous presentations and publications about PBL successes throughout the DOD. For the Stryker vehicle, the sustainment strategy is CLS with specific performance metrics written into the contract. Stryker typically makes the top of PBL success lists for ground combat systems.

By doctrine, the Stryker sustainment strategy depends on an austere logistics package.<sup>2</sup> Deploying a Stryker brigade anywhere in the world within 96 hours is a component of the Stryker brigade's flexibility. To meet the Army requirements for being rapidly deployable and combat capable, the Stryker brigade relies on minimizing the number of personnel and spare parts within the brigade. The current Stryker CLS sustainment strategy, accomplishes this.

#### Problem Statement

The problem is that the DOD policy that makes PBL the preferred support strategy appears to be in direct conflict with the recent Army sustainment decisions for

Stryker. On 1 November 2005, the Army directed changes to the Stryker system support arrangement. The original Stryker CLS contract started out completely reliant on General Dynamics Land Systems (GDLS) for maintenance, parts acquisition and management, and use of its financial systems. This meant that the Program Executive Office (PEO) controlled the money to pay GDLS with no involvement of the Army Standard Army Information Systems (STAMIS). By most noticeable measures, the original CLS support strategy appeared to be successful. The sustainment strategy was truly “performance based.” The performance measure written into the contract called for a 90 percent operational readiness rate (ORR) during deployments. Cumulative operational rates for two Stryker Brigade Combat Team (BCT) rotations in Iraq were over 95 percent (see figure 1). Albeit some contractor on the battlefield problems that were anticipated and planned for, contractors deployed and performed extremely well. Missions were accomplished and the support strategy did not appear to be an issue.

A recent contract modification has now integrated the Stryker into the Army STAMIS and financial processes. The Army is currently training Stryker mechanics and plans to transfer to field level organic (soldier) support for Stryker beginning in 2008.<sup>3</sup> The Army’s plan replaces the existing forty-five Stryker vehicle maintenance contractor personnel in the SBCT with seventy-one soldiers. This poses the question: Why did the Army decide to change the sustainment strategy for the Stryker when it appeared to be successful? A concern with classic organic sustainment is one of the reasons behind the advocacy of CLS because these traditional support structures do not always perform well. The directive order for the new sustainment strategy calls for an organic performance-

based arrangement. According to many experts working in the PBL arena, there is really no such thing as a feasible organic PBL.

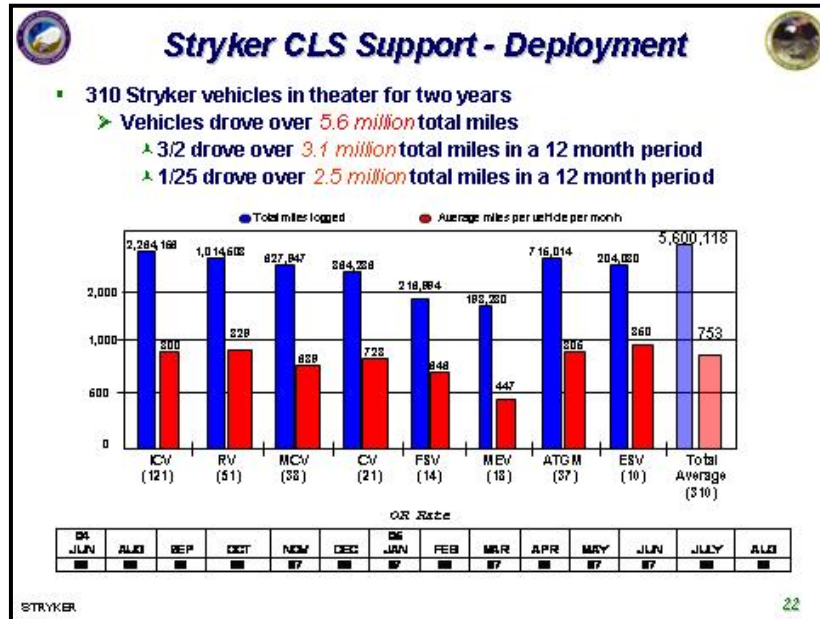


Figure 1. Stryker Operational Readiness Rates under Contractor Logistics Support  
 Source: Program Manager, SBCT Stryker Sustainment Readiness Review Briefing, Warren, Michigan, 24 October 2005, Slide 29

### Purpose

The primary purpose of the study is to identify the benefits and challenges of PBL as related to the Stryker CLS sustainment strategy. The study will explore how, or if, the Army can successfully overcome the challenges associated with PBL, specifically the CLS arrangements with ground combat systems. Using the Stryker CLS strategy as a case study, this research seeks to identify the challenges, and lessons learned from CLS, so that the Army can apply them to other PBL arrangements in the future. The secondary purpose is to identify the challenges associated with transitioning from CLS to organic

support and provide recommendations to overcoming them. The final purpose is to explore the notion of “Organic PBL” to determine if it is, in fact feasible.

### Thesis Question

Primary Question: Is the Stryker contractor logistics support strategy the Army’s first significant system-level performance-based logistics success for ground combat systems?

Secondary Questions: The following secondary questions have many tertiary questions associated under them. They are as follows.

1. What is the PBL Methodology? What are the characteristics, benefits, challenges, and risks of PBL? What is CLS in the spectrum of PBL arrangements? What defines a PBL success?

2. Why did the Army change the Stryker CLS support strategy? What are the challenges with the Stryker CLS support strategy? What were the factors that influenced the decision to modify the Stryker CLS contract? Is CLS for ground combat systems no longer a viable support strategy for the Army? Is CLS only a temporary support strategy to get new ground systems fielded quickly? If CLS did not work long term for Stryker, will it work long term for other new ground combat systems? Or did it work, but other factors drove the decision to switch to organic support? What were those factors? Is CLS too expensive to maintain? What are the hurdles to overcome with respect to integrating CLS and PBL into the Army financial processes? Is CLS not flexible enough in the Contemporary Operating Environment (COE)? Is CLS not flexible enough on the traditional linear battlefield? Are there cultural implications that prevent CLS from being



fully implemented with ground combat systems? How can the Army successfully adapt to, and overcome PBL and CLS challenges?

3. What new challenges are created by transitioning from contractor to organic support? Will the organic strategy still be considered a PBL arrangement? With organic support alone, or even limited contractor support, are there sufficient measurable aspects that can still be defined as PBL? How will the Army's ability to replace contractor personnel with soldiers be affected by personnel challenges, particularly with respect to the recruitment and retention of additional soldiers? How will the Army sustain soldier skills and knowledge on Stryker vehicle maintenance with only seven SBCTs for these special skilled soldiers to serve in? Will the increased size of the brigade resulting from additional soldiers still allow the SBCT to meet its 96-hour deployment goal?

To understand these issues, it is necessary to begin with a short background on PBL and how it came to be, followed by an overview of the original plan for Stryker CLS. Both topics will be described in much more detail in chapter 2; however, a short overview now will set the stage for a deeper review later

### Background on Performance-Based Logistics

In 2001, DOD determined that PBL is the preferred approach for executing product support in the armed services. In response to this determination, DODD 5000.1 was issued to address the policy related to Performance-based logistics. The core of it reads as follows: "PM's shall develop and implement performance-based logistics strategies that optimize total system availability while minimizing cost and logistics footprint. Sustainment strategies shall include the best use of public and private sector

capabilities through government/industry partnering initiatives, in accordance with statutory requirements.”

In accordance with this directive, the DOD is moving away from transaction-based, functionally oriented weapon system sustainment towards obtaining desired operational objectives (such as readiness, reliability, and maintainability) as a predetermined package. In other words, the government is buying output capability at an agreed-upon level and price, rather than purchasing discretely priced logistics elements on a transaction-by-transaction basis. The PBL support provider ensures that all elements of logistics support are available to provide an agreed-upon level of system availability on demand.<sup>4</sup> More simply, PBL is about buying a solution or outcome, not defining the process or method to achieve it. It is about assigning responsibility to the supplier, not the requiring organization. Instead of the traditional role of managing supplies, the government’s role in PBL becomes one of managing the supplier where the supplier has a more active role. PBL is a product support strategy to optimize weapons system readiness by purchasing logistics support as an integrated, affordable performance package. Instead of buying set levels of spares, repairs, tools, and data, the new focus is on buying a predetermined level of availability to meet the war fighter objectives. PBL changes all of the incentives for potential product support providers. With this approach, the accountability and responsibility for the integration of support elements are linked to the specific war fighter performance requirements for weapon system readiness and operational capability.

In February 2004, the Deputy Secretary of Defense issued a memorandum promoting a more aggressive implementation of PBL. Under these directives the Army

has moved forward using PBL as a long-term, best-value, acquisition and sustainment strategy where the provider agrees to incentives, is empowered to determine how to satisfy specified metrics, and is expected to improve product support effectiveness while reducing total ownership cost. There are currently 85 Army PBL contracts reported that range from full to partial CLS.<sup>5</sup> This is a big shift from relying on organic (soldier) support alone for a system. This shift has created an on-going debate in the Army as to how much CLS can be outsourced effectively. The Army is in the process of finding the right mix between organic and CLS for different systems. The process of finding the best mix is spearheaded by the individual system Program Manager Offices in the form of a Business Case Analysis.

#### Background on Stryker Contractor Logistics Support

The original Stryker PBL arrangement was entirely CLS. The contract included ordering spare parts, managing a spare parts warehouse, worldwide distribution of repair parts, and completing maintenance services on Stryker wheeled combat vehicles. The largest group of contractor support within the brigade focuses on the Stryker vehicle, and the duties of the contractors include conducting maintenance on the Stryker vehicle and managing the Stryker-specific supply chain. Stryker vehicle contractor personnel perform duties that are similar to five military occupational specialties: wheeled vehicle mechanic (63B), fire control repairer (45G), armament repairer (45K), automated logistics specialist (92A), and unit supply specialist (92Y). GDLS supplies all parts under a PBL contract using a warehouse in Auburn, Washington. Inherent to managing this warehouse, they perform all requirements determination and inventory management functions. GDLS also manages repair of all returned unserviceable items and is

responsible for the repair of all Stryker specific components outside of Brigade. To manage these functions, they use a unique system called Data Management Information System (DMIS). GDLS has supply clerks embedded in the SBCT as an interface to DMIS.

The new Stryker support strategy plans to transition at the rate of two active brigades per year to organic support for all maintenance. To implement this plan the Army must annually recruit or retain 497 additional soldiers with the specific military specialties listed above, to support all seven Stryker brigades. Stryker logistics support data management functions were transferred to the Army STAMIS in October 2006.

#### Assumptions

A few assumptions are necessary for this research to remain of significant importance.

1. The Army will maintain its course and continue with the shift from contract to organic maintenance for Stryker and the plan will be properly resourced, to include the necessary personnel and funding.

2. PBL will remain the DOD preferred strategy for executing product support in the armed services.

3. A new middle ground will be defined with training, parts supply, and etcetera to stay with the contractor.

#### Limitations

Classified information is not used in this study. The only factor that may limit the applicability of research findings to a specific context is the abundance of “For Official

Use Only” (FOUO) material on this topic. There are many pre-decisional factors relating to Stryker logistics support that are published as FOUO.

### Scope

Because there are numerous, equally valid realities relevant to successful implementation of PBL in the Army, this paper will utilize a case study approach that concentrates on the PBL arrangement with the Stryker system, with some policy analysis as appropriate.

### Delimitations

The scope of the study has been delimited in a number of ways. The research effort will not inquire into the following four areas:

1. PBL in Joint Communities: The research has been restricted to PBL implementation in the Army, specifically the CLS arrangement with Stryker. There will be no discussion on how PBL is being implemented in the other services because the concept is being implemented differently across the services, and would far exceed the scope of this research.

2. Metrics: Determining and defining the right metrics is another immense concern in the PBL world. The Army needs definition of high level Army Enterprise metrics for PM and war-fighter performance-based agreements (PBAs). There is concern that metrics need to be a hierarchical structure with the high level, macro metrics driving down to the lowest level in the Performance Based Agreements with the Product Support Providers. The metrics used to measure performance can vary by commodity as well. Diving into this as a sub problem would far exceed the scope of this research.

3. Future Combat Systems (FCS): PBL support of systems that are complimentary to the Future Combat System in the FCS equipped BCT is under development at many agencies. PBL in FCS literature is so restricted and limited that it does not allow for detailed research at this point.

4. Challenges of Contractors on the Battlefield: The number of contractors and the scope of their activities clearly have significant impacts on the Army. These range from the ability to free up field maintainers for other duties, the need to protect contractors on the battlefield, and to insurance and cost concerns. Given the scope of these impacts, it is not feasible to attempt to address them in much detail in this study.

#### Significance of the Study

This topic is important because PBL is directed by DOD and appears to be gaining momentum as the primary way to provide logistics support to Army systems in the future. Because the SBCT is the bridge between the existing force and the Army of the future, the process by which conceptual changes are viewed and implemented determines not only how the SBCT operates, but also how the Army plans to address the same issues for other combat systems sustainment. The results could be used to improve PBL awareness, practice, and effectiveness. The results could also help in resolving PBL problems and clearing up controversies.

This concludes the introductory chapter. The researcher has discussed the background, the problem statement, and the primary and secondary research questions. The scope, delimitations, and assumptions of the research have been set. The purpose and importance of the study should now be clear. The next chapter will review the literature found in a number of documents related to the topics of PBL and Stryker

---

<sup>1</sup>U.S. Department of Defense, DOD Directive 5000.2, *Operation of the Defense Acquisition System*. Washington D.C.: U.S. Government Printing Office (May 2003)

<sup>2</sup>U.S. Department of the Army, FM 3-21.31 SBCT, Washington, D.C.: U.S. Government Printing Office (March 2003)

<sup>3</sup>Stryker Sustainment Readiness Review Decision Memorandum. (1 November 2005)

<sup>4</sup>Kobren, Bill “Mitigating Diminishing Manufacturing Sources and Material Shortages.” *Defense AT and L* 34 no. 3(May/Jun 2005): 62-66.

<sup>5</sup>Defense Acquisition University, on-line PBL toolkit available at: <https://acc.dau.mil/pbltoolkit>

## CHAPTER 2

### LITERATURE REVIEW

#### Introduction

The literature review is conducted in two parts. Part one is a review of PBL related literature. Part two is a review of Stryker related literature. Both parts begin with an overview of the current state of publications on the topic, followed by a list of the most relevant policies, and then a timeline of significant events.

#### Part I: Performance Based Logistics Literature Review

##### Performance-Based Logistics Publications

There is an abundance of current material on the topic of PBL. Numerous policy letters, guidebooks, articles, presentations, and studies that adequately addressed PBL implementation were selected for review in this research. The most important schools of thought on PBL are found in the Defense Acquisition University (DAU). DAU is the instructional proponent for PBL and offers many courses on the subject. Other studies of PBL conducted by former students at the Army War College, and the Naval Post Graduate School are reviewed. There are also numerous articles published in Army Logistician and AL&T magazines that broach the topic. Related literature from Army Material Command (AMC), TACOM, and ASAALT, is also reviewed. Many items reviewed are in the form of briefings or electronic mail messages. There are three main guides to PBL from different agencies. These guides were the “core” references in many instances and are summarized below.



The Defense Acquisition University PBL Toolkit: This website is the primary method used to educate the DOD on the concept of PBL. It is entirely web-based and provides a collaboration forum for PBL related material. The toolkit provides a detailed discussion of key aspects of PBL and presents a basic methodology for implementing Performance-Based Logistics using a 12-step process model. It discusses Performance-Based Agreements, and Source of Support, which includes maintenance, supply, transportation, and CLS. Users may also interact with the PBL toolkit by participating in discussion forums.

Performance Based Logistics (PBL) Support Guidebook: The Defense Contract Management Agency (DCMA) *PBL Support Guidebook* is designed to assist functional specialists and managers in supporting the PBL efforts in the pre-systems acquisition, systems acquisition and sustainment phases.

U.S. Army Implementation Guide to Performance-Based Logistics (4 May 2004): This guide was developed to provide the reader with the background surrounding the Office of the Secretary of Defense (OSD) mandate to implement Total Life Cycle Systems Management (TLCSM) and PBL. It offers an overview of PBL, and a recommended process for developing and implementing PBL on Army legacy, interim, and future systems. The target audience for this guide is the requirements, acquisition, and logistics community, with a focus on the Supportability Integrated Product Team (SIPT) members.

Performance Based Logistics: A Program Manager's Product Support Guide (10 Nov 2004): This document supersedes *Product Support: A Program Manager's Guide to Buying Performance*, published in November 2001, which is commonly known as “The

PBL Guide.” This guide captures the progress that has been made in implementing PBL over the past three years and presents up-to-date guidance based on the lessons learned from the application of PBL to support activities throughout the Armed Services.

#### Performance Based Logistics History Timeline

The timeline below covers the most crucial phases of PBL history to include PBL policies that have been issued and their effects.

September 2001 (Quadrennial Defense Review Report): The *QDR* directed implementation of PBL to compress supply chain and improve readiness for major weapon systems and commodities. It stated that modern business systems with appropriate metrics can eliminate many non value-added steps.

February 2002 (OSD PBL Memorandum): This memorandum directed the Services to submit PBL implementation plans by 1 May 2002. It sets forth guidance for development of PBL strategies and implementation of product support policy. It directs Service Acquisition Executives (SAEs) to submit plans for implementing PBL across all new programs and all fielded ACAT I and II programs. It provides guidance on both service-wide and program-level implementation. It establishes The Office of the Deputy under Secretary of Defense (ODUSD) Logistics Plans and Programs as the lead.

March 2002 (Future Logistics Enterprise Memorandum): ODUSD Logistics and Material Readiness Division (L&MR) published the Future Logistics Enterprise (FLE) which encompassed Total Life Cycle Systems Management (TLCSM) and PBL. In October 2003 the FLE was renamed Force Centric Logistics.

May 2003 (DOD 5000.2 Policy): This policy states that Program Managers shall develop and implement PBL strategies that optimize total system availability while

minimizing cost and reducing the logistics footprint. The strategies shall include the best use of public and private sector capabilities through government and industry partnering initiatives, in accordance with statutory requirements.

February 2004 (Continued Progress on PBL Memorandum): This memorandum directs the Under Secretary of Defense (USD (AT&L), in conjunction with USD (Comptroller), to issue clear guidance on purchasing using performance criteria and each Service to provide a plan to aggressively implement PBL, including transfer of appropriate funding, on current and planned weapon system platforms for Fiscal Year 2006-2009.

February 2004 (Management Initiative Decision 917): This MID directs a pilot program to test revised contracting, programming, budgeting, and financing processes for PBL agreements. It directs the MILDEPS to realign PBL resources from functional PE's into the PE that finances the system that the PBL agreement supports. It tasks the MILDEPS to identify single lines of accounting in their O&M appropriations for financing O&M requirements for the pilot PBL programs.

August 2005 (PBL BCA Policy): This policy mandated that all PMs conduct a BCA on their programs. It states that a prerequisite to the application of PBL is the completion of a BCA, which is a structured methodology that considers processes, resources, and feasible alternative courses of actions, such as CLS (CLS), organic support, or a combination of support options that will determine if a system is a candidate for PBL.

January 2006 (Army Regulation 700-127): Department of the Army, Integrated Logistics Support (ILS), Army Regulation 700-127 is released with the Army's definition

of PBL. It states that the Army will implement PBL within the ILS process. The ILS process will apply to all materiel systems procured under the provisions of AR 70-1, including associated software procured or modified for use by Army units.

September 2006 (Army PBL Reporting Requirement Memorandum): This memorandum signed by the ASAALT provides the criteria for defining a PBL product support strategy and requires the submission of numerous PBL tracking reports.

### Performance Based Logistics Overarching Strategies

The continuing PBL literature review is organized like an inverted pyramid because a big to small approach should set the stage for the discussion of the problem statement in chapter 4. To fully understand the challenges of the original Stryker PBL/CLS support strategy, there must first be a basic understanding of the overarching strategies of how PBL fits into the big picture, and the general concepts of PBL. Therefore, the PBL literature review will begin with a comprehensive perspective of PBL. It will start at the strategic level with a discussion of Focused Logistics (FL), and then dig down to reveal the Force Centric Logistics Enterprise (FLE) initiative of Total Life Cycle Systems Management (TLCSM), of which PBL is a major component.

### Focused Logistics

Focused Logistics (FL) is the DOD's approved Joint Logistics Functional Concept designed to achieve logistics capabilities in support of distributed adaptive operations. FL is the strategic concept that defines broad joint logistics capabilities that are necessary to deploy, employ, sustain, and re-deploy forces across the full spectrum of operations. Focused Logistics is the ability to provide the joint force the right personnel,

equipment, supplies, and support in the right place, at the right time, and in the right quantities, across the full range of military operations. This will be made possible through a real-time, net-enabled information system providing accurate, actionable visibility as part of an integrated operational picture, effectively linking the operator and logistician across joint forces, Services, support agencies, the commercial sector, and coalition partners. Through transformational innovations to processes, systems, and organizations, FL will provide the joint warfighter with support for all functions.

#### Force Centric Logistics Enterprise

The Forced Centric Logistics Enterprise (FLE) is DOD's near-term vision (2005-2010) to accelerate logistics improvement, enhance support to the warfighter, and align logistics processes with the operational demands of the 21st Century. The FLE is an integrated set of six collaborative initiatives to achieve end-to-end customer service within the DOD logistics operations. The primary intent of the FLE is to accelerate DOD's implementation of integrated logistics chains and commercial information systems to meet the warfighter sustainment needs and the operational requirements of the National Defense Strategy. The FLE is focused on near term policy, process, and systems changes that DOD must make in order to continue to effectively support the warfighter. One major subset of FLE is Total Life Cycle Systems Management (TLCSM).

#### Total Life Cycle Systems Management

The total life cycle systems management (TLCSM) initiative incorporates a collection of sub-initiatives that include PBL and Performance-Based Agreements (PBA's). PBL is the preferred approach to TLCSM. TLCSM establishes clear lines of

responsibility and accountability for meeting warfighter support performance and sustainment requirements for the life of the system from acquisition to disposal. Under TLCSM there is no longer a transition of management from the Program Manager (PM) to a sustainment command after production and fielding. The PM is formally designated as the life-cycle manager (LCM) for assigned programs and retains the responsibility for managing, sustaining, and upgrading systems throughout the service life of the program. Throughout the life cycle of the assigned system, the PM ensures supportability is co-equal with cost, schedule, and operational performance.”<sup>1</sup> Under TLCSM, the program manager assesses proposed system modifications in light of sustainability and logistics support impact. Continued assessment of in-service system performance may identify system redesign needs to address inadequate characteristics, like reliability, obsolescence, and safety.<sup>2</sup> For an illustration of TLSCM see figure 2.

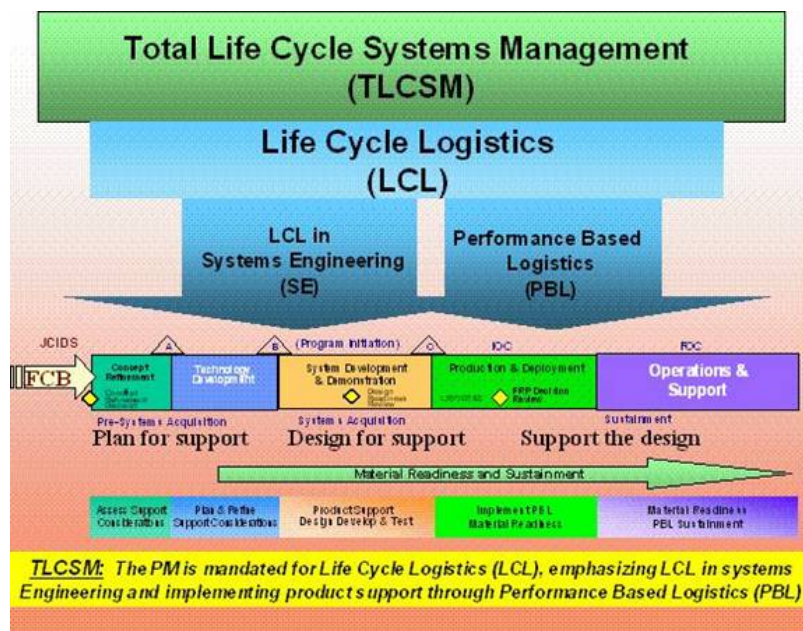


Figure 2. Total Life Cycle Systems Management

Source: Defense Acquisition University, PBL Road-show Presentation, Fort Belvoir, VA, October 2006

## Definitions of Performance-Based Logistics

DAU Definition of PBL: The *Defense Acquisition Guidebook* currently defines PBL as: “The purchase of support as an integrated, affordable, performance package designed to optimize system readiness and meet performance goals for a weapon system through long-term support arrangements with clear lines of authority and responsibility. Application of PBL may be at the system, subsystem, or major assembly level depending on program unique circumstances and appropriate business case analysis.”<sup>3</sup>

Army definition of PBL: In January 2006, the Army released its definition of PBL as; “The Department of Defense (DOD) preferred product support strategy for weapon system product support that employs the purchase of support as an integrated performance package designed to optimize system readiness. PBL is the delineation of output supportability requirements for acquisition systems and the assignment of responsibilities and incentives for the attainment of these requirements.”<sup>4</sup>

ASAALT definition of PBL: “PBL is a strategy for weapon system product support that employs the purchase of support as an integrated performance package designed to optimize system readiness. It meets performance goals for a weapon system through a support structure based on performance agreements with clear lines of authority and responsibility.”<sup>5</sup> (Product support is defined as a package of logistics support functions necessary to maintain the readiness and operational capability of a system or subsystem). The package of logistics support functions includes material management, distribution, technical data management, maintenance, training, configuration management, engineering support, repair parts management, failure reporting and analysis, and reliability growth.

## Benefits of Performance Based Logistics

The application of PBL can provide numerous benefits. The most visible benefits of PBL are in the operational portion of the program life. PBL should reduce logistics costs and footprint, increase system reliability, and mitigate obsolescence.<sup>6</sup>

PBL will reduce logistics cost and footprint. PBL will get the best capability return on the funds available in Army to support weapons systems. In other words, incentive oriented agreements should reduce product support costs through reduced infrastructure, reduced obsolescence, and reduced provisioning and data requirements. PBL will provide more visibility and control over operations and support costs which will ultimately improve the ability to manage program resources. With this visibility and control, PBL should create a reduction in the overall demand for logistic support and reduce the logistics footprint.

PBL will increase system reliability. Incentive oriented agreements will improve weapon system availability and provide warfighters with increased operational readiness. The provider is provided incentives to ensure that set levels of system support performance are achieved. If the contract is correctly incentivized, the items, components, or sub-systems that configure the weapon system will be designed to fail less. The PBL supplier then has the financial incentive to continuously improve performance because it has a bottom-line impact. This in turn will improve customer satisfaction. PBL will result in confidence in the warfighter that the system will provide the required performance capabilities when needed in combat.

PBL will mitigate obsolescence. PBL provides a powerful tool for mitigating obsolescence and making continuous modernization a reality for legacy weapon systems.



PBL clearly fulfills the need for continuous modernization and obsolescence mitigation. Because it provides incentives for private industry to continually improve reliability and the performance of the managed system. In this manner, private industry conducts research and development (R&D) and acquisition activities in-stride with performing their contracted logistics support contract. Consistent with evolutionary acquisition practices and the spiraling of technology as it matures, the PBL contractor can leverage R&D efforts for spirals into legacy component system reliability.

#### Spectrum of Performance Based Logistics Arrangements

It is important to note that each PBL arrangement is unique and will vary from other PBL arrangements. A PBL arrangement may take many forms. There is no “one size fits all” approach to PBL. Each program must tailor the PBL application to its own unique circumstances. The product support concepts range from autonomic (hands off) logistics that leverages technology and virtual support teams, to a product support strategy for major weapon system platforms in its totality by a government or contractor entity. The strategy range of alternatives extends from the organic providers being responsible for meeting the outcome performance objectives to the private sector accepting this responsibility. In between these two options is public-private partnering, which represents a shared responsibility.<sup>7</sup> Further, there are many gradients of PBL strategies across this spectrum, each strategy being unique for each weapon system. Figure 3 reflects a sample of the range of PBL strategies.

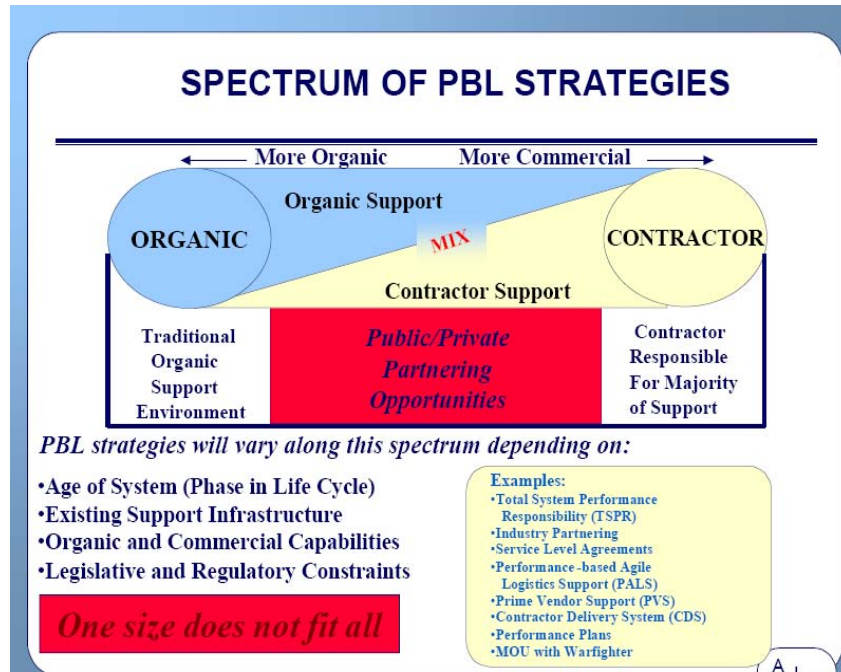


Figure 3. Spectrum of Performance-Based Logistics Strategies  
 Source: Defense Acquisition University PBL Road-show Presentation, Fort Belvoir, VA, October 2006

### Program Manager Roles and Responsibilities

Under PBL, PM's are held responsible for the overall management of the weapon system life cycle. This includes: timely acquisition of weapon systems, meeting warfighter performance requirements, integration of sustainability and maintainability during the acquisition process, and weapon system sustainment to meet or exceed warfighter performance requirements throughout the life cycle at best corporate value to the Services and DOD. In other words, the Program Manager is now responsible for Total Life Cycle System Management, from cradle to grave, ensuring that they will apply a long-term perspective to acquisition decisions to ensure the army fields supportable, reliable, and affordable systems. To do this effectively, the PM must develop and document a product support strategy that addresses all of the logistics functions. They

must make this strategy a part of the program acquisition strategy. The PM must negotiate a performance-based agreement that satisfies the warfighter’s needs and then must develop a performance-based work statement for the Product Support Integrator (PSI). The PM must continually monitor the PSI’s performance. Finally the PM must update the product support strategy at least every five years of the program’s life cycle. The Army PBL Model (figure 4) illustrates the process.

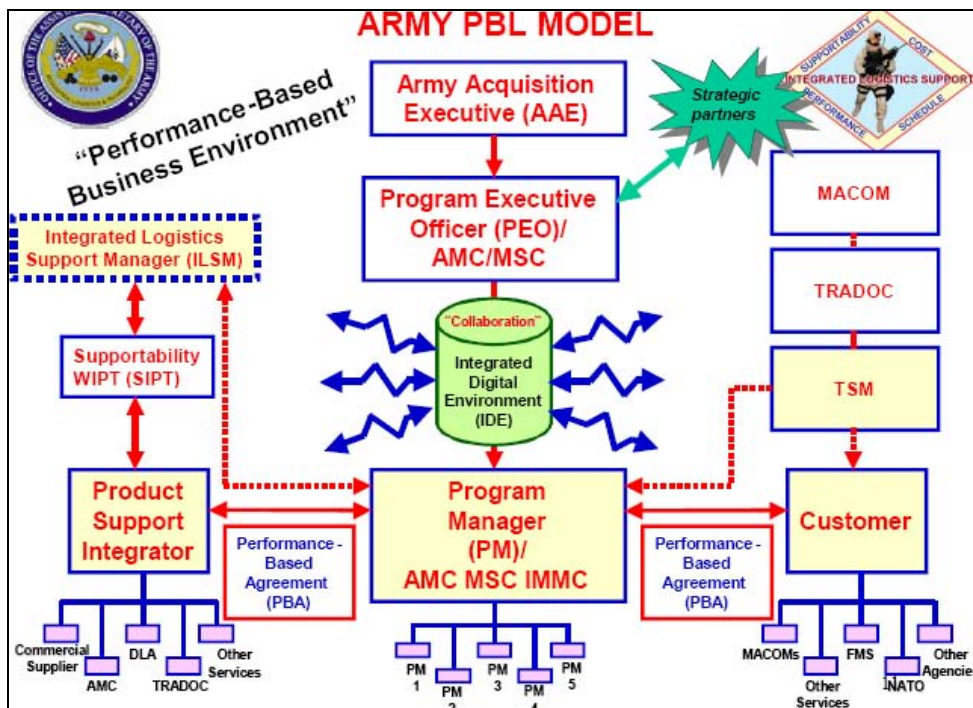


Figure 4. Army Performance Based Logistics Model

Source: Defense Acquisition University PBL road-show presentation, Fort Belvoir, VA, October 2006

### Characteristics of Performance-Based Logistics

There are a few main characteristics that separate PBL from former product support concepts. Product support is characterized by a Business Case Analysis (BCA), Product Support Integrators (PSI’s), Performance Based Service Agreements (PBA’s),

Performance Metrics, and Provider Incentives. First, the performance and support requirements are documented as metrics in PBA's between the Warfighter, the PM, and the support provider. Next, a single focal point for support is established. This single point PSI integrates and manages all sources of support for the system. The final characteristic is that the support provider is offered incentives. The more efficiently they can provide reliable and ready systems, the more they are rewarded, so that both DOD and the support provider "win."

### Business Case Analysis

Business case analysis's (BCAs) are required by statute for all PBL support arrangements. The selection of sources of support, and the allocation of workload among those sources, is not a simple process. One of the best tools to ensure that an optimum allocation of workload has been achieved is the BCA. BCA's are excellent decision-making tools, and their use is widespread in the private sector for effective business decision-making. The use of BCA's in DOD, while longstanding, has only recently been used at the weapon system level to determine and validate support strategy decisions. Although each service has their own format and guidance regarding BCA's, OSD recently issued a set of "Guiding Principles" for BCA preparation.

### Product Support Integrator

A product support integrator (PSI) coordinates logistics support organizations across government and industry, and manages PBL. PBL can use either a commercial or organic PSI to meet the warfighter's performance requirements. The PSI has the responsibility to act as the interface between the PM and all of the support providers for a

weapon system. The PSI does all integration of support, ensuring that all tiers of support, from the prime contractor to sub-tier contractors and organic organizations, are optimizing their support for the weapon system. The PSI is still a “single focal point” for integrating support, regardless of the range and number of support providers. Figure 5 a depicts how this works.

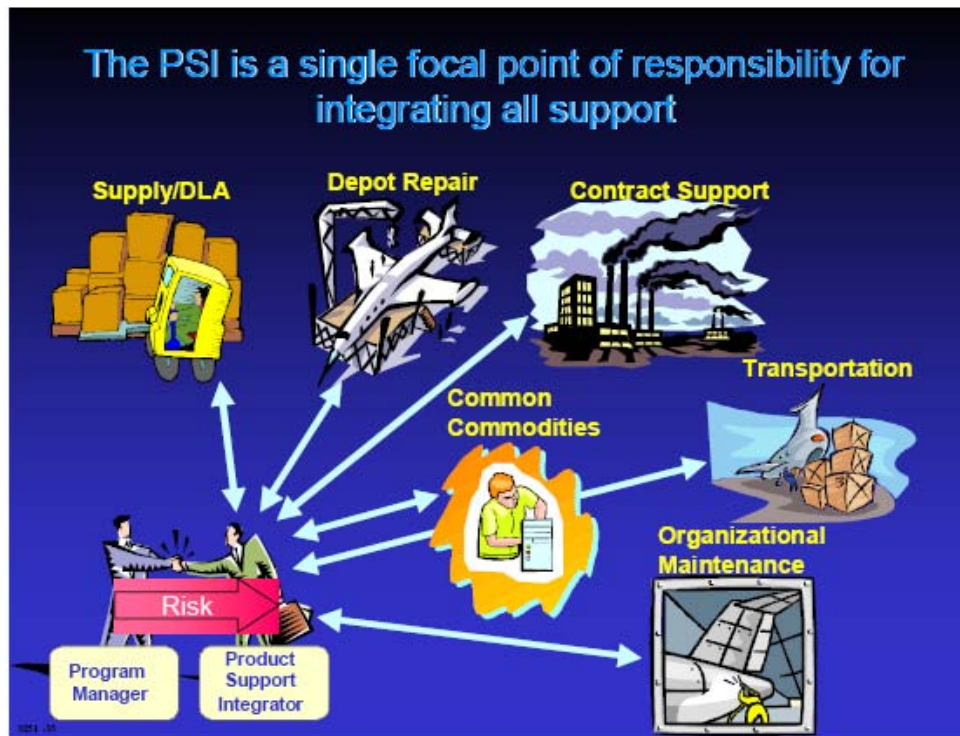


Figure 5. The Product Support Integrator

Source: Defense Acquisition University, PBL road-show presentation Fort Belvoir, VA, October 2006

### Performance-Based Agreements

Performance-based agreements (PBAs) are one of the key components of an effective product support strategy. In fact, PBL is centered on performance agreements between the Warfighter and the Program Manager. These performance agreements focus

on system readiness and warfighter support. Warfighter requirements are then stated in performance metrics, not the process. They are intended to preserve the warfighter resources of dollars and people. Ideally these PBAs are implemented and executed transparent to the warfighter. Success or failure of the product support system is measured on the basis of this PBA in which the central metric is warfighter oriented. They establish the negotiated baseline of performance, and corresponding support necessary to achieve that performance, whether provided by commercial or organic support providers. The PM, using the desired performance of the warfighter, negotiates the required level of support to achieve the desired performance at a cost consistent with available support funding. Once the performance, support, and cost are accepted by the stakeholders, the PM enters into PBAs with users, which specify the level of operational support and performance required by them. Likewise, PMs enter into PBAs with organic sources and contracts with commercial sources, which focus on supporting the users in terms of cost, schedule, performance, sustainment, and disposal. To coordinate the work and business relationships necessary to satisfy the user agreement, program managers select a PSI from the government or private sector, who serves as a single point of accountability to integrate support from all sources to achieve the performance outcomes specified in the performance-based agreement. The agreements maintain flexibility to facilitate execution year funding and/or priority revisions. PBA's also reflect a range of support levels to facilitate revisions in support requirements without preparing new ones.<sup>8</sup> See Figure 6 below for an illustration of this process

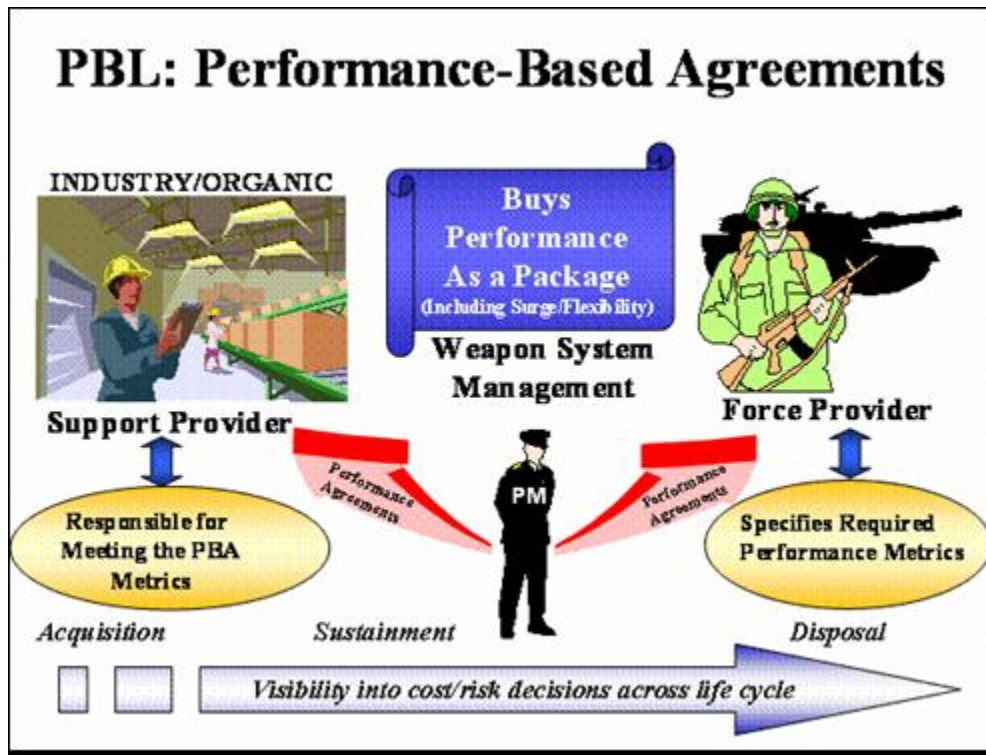


Figure 6. Performance-Based Agreements

Source: Defense Acquisition University, PBL road-show presentation, Fort Belvoir, VA, October 2006

### Performance Metrics

Under PBL, a performance measurement methodology (metrics, methods, and frequency) is used. These metrics specify warfighter focused outcomes (results). Requirements are based on a performance specification as opposed to a detailed specification stating the process and procedures to be used. The government then seeks access to this data as opposed to seeking ownership of the data. There are five preferred PBL metrics: (1) operational availability, (2) operational reliability, (3) cost per unit usage, (4) logistics footprint, and (5) logistics response time (customer wait time). Another common metric is the “guaranteed availability of parts” whereby the supplier

guarantees a certain level of availability. Availability percentages tend to be absolute. If a PBL contract guarantees that a replacement unit will be made available within 48 hours 95 percent of the time, then it would be deemed a breach of contract if, say 11 *percent* of the replacement units arrived after 48 hours--even if the other 89 percent of the units were delivered well within the 48 hour deadline. Such a black and white approach is yet another compelling reason for the supplier to deliver on time, particularly when financial penalties, such as cessation of payments, may be imposed.<sup>9</sup>

### Incentives for Product Support Providers

PBL selects best-value providers from government, industry, or government/industry partnerships. These selected product support providers are provided incentives to increase reliability, and/or reduce the logistics footprint. These incentives are mutually beneficial and can be monetary, or non monetary. The use of incentives maintains long-term competitive pressures on government and industry providers. The PBL approach is designed to provide incentives for the contractor, with government oversight, so private industry is allowed to implement the efficient practices already in place in the private sector. The general approach is to progress the government contract into a “fixed price with incentives” instrument so that cost savings from contractor-provided part reliability, maintenance, and sustainment improvements that result in increased performance (usually measured in unit or equipment readiness levels) accrue monetary returns for both the contractor and the government. With cost savings shared directly with the contractor, the contractor is encouraged to undertake its own investment strategies to identify and improve low reliability components, enhance supply chain efficiency, use smart decision tools that provide real-time cost visibility, leverage off-the-



shelf components that improves system overall performance and/or reliability and to establish performance based support relationships with its own parts providers.

This concludes Part I of the Literature Review. It provided a comprehensive background of PBL starting with how PBL derives from the overarching strategies of Focused Logistics (FL) and Total Life Cycle Systems Management. It covered different PBL definitions, the benefits of PBL, the spectrum of PBL arrangements, and the PM roles. The review discussed the characteristics of a PBL strategy to include a Business Case Analysis (BCA), PM designation of a Product Support Integrator (PSI), the use of a binding Performance Based Agreement (PBA), and the use of incentives. It ended with a discussion of using performance metrics. With this common understanding of these fundamental PBL concepts, it is time to transition to a review of Stryker related literature.

## Part II: Stryker Literature Review

### Stryker Publications

The primary manual governing Stryker is FM 3-21.31 Stryker Brigade Combat Team. This manual describes how the SBCT optimizes organizational effectiveness while balancing lethality, mobility, and survivability against requirements for rapid strategic deployability. It provides the commander and staff with the tactics and techniques to exploit these elements and ensure the SBCT's versatility across the full range of potential requirements, from providing the security necessary to conduct stability operations during peacetime military engagements to conducting offensive and defensive operations in a major theater war against localized threats.

## Stryker Timeline

In a span of six years, the Army announced its intention to create a new brigade, chose a vehicle, tested the operational concept, and deployed three brigades in support of Operation Iraqi Freedom. It is now the Army's highest-priority combat vehicle program and the centerpiece of the ongoing Army Transformation. The timeline below highlights significant events in the Stryker timeline to include major acquisition milestones, policies and directives.

October 1999 (CSA Announcement): At the annual AUSA convention in Washington D.C., GEN Eric Shinseki challenged the acquisition community to provide the Army with a rapidly deployable force, capable of operating against the full spectrum of military threats. He wanted it to assist the Army in covering the capabilities gap between its legacy force heavy and light units, thus terming the concept the “Interim Brigade Combat Team (IBCT). The IBCT announcement initiated the most aggressive Major Defense Acquisition Program (MDAP) ever conducted by the Army.

December 1999 (Industry Day): On 1 December 1999, less than two months after the CSA’s announcement, the Army held an industry day to explain its plans and solicit industry input. 400 representatives, 64 contractors, and 12 countries attended.

January 2000 (Platform Performance Demonstration): In January 2000, the Army conducted a live market survey at Fort Knox, Kentucky to determine the state of the art of medium armored vehicles available on the world market.

March 2000 (Operational Requirements Document Approved): The acquisition community teamed with the U.S. Army Training and Doctrine Command (TRADOC), as well as the test community and the Air Force, to refine the Interim Brigade Combat Team

(IBCT) Organizational and Operational (O&O) concept and the Interim Armored Vehicle (IAV) Operational Requirements Document (ORD). The Joint Requirements Oversight Council (JROC) approved the IAV ORD on 6 March 2000.

April 2000 (Interim Armored Vehicle Acquisition Strategy Report Approved): The Under-Secretary of Defense for Acquisition, Technology and Logistics (USDATL) approved the IAV Acquisition Strategy Report (ASR) on 3 April 2000. On 6 April 2000, less than six months after the CSA's initial announcement, the Army published the IAV solicitation.

June 2000 (Source Selection): The Army conducted formal source selection that included live testing of bid samples at Aberdeen Proving Ground, Maryland.

November 2000 (Contract Awarded to General Dynamics): On 16 November 2000 the USDATL reviewed the program and, to enable the Army to maintain momentum of transformation, approved an initial production quantity of 968 vehicles (45 percent of the total buy), affirming OSD support for the rapid pace of Army Transformation. An hour later, the Army awarded the IAV contract to General Motors/General Dynamics Land Systems Defense Group.

April 2001 (United Defense Protest Resolution): United Defense Limited Partnership (UDLP) filed a protest with the General Accounting Office (GAO) but the GAO denied the protest. Faced with a potential four-month schedule delay, the Army conducted an in-depth effort to regain the time lost to the protest. Working with GDLS, the Army accelerated deliveries and streamlined fielding, and recaptured the original schedule.

May 2002 (CLS Contract Awarded to GDLS): Specifically, PEO IAV awarded a contract to General Dynamics Land Systems (GDLS) for a set number of Stryker vehicles, and on the contract was an option for Interim Contractor Logistics Support (ICLS), and on that option was an option for deployed ICLS. The ICLS portion of the contract was Cost Plus Fixed Fee (CPFF), which means PEO IAV directly reimbursed GDLS for their costs plus a fixed dollar value fee (basically profit), conditional upon achieving a 90 percent operational readiness rate.

October 2003 (3/2 SBCT deployed): 3/2 SBCT drove over 3.1 million total miles in a 12 month period and maintained a 96 percent ORR.

September 2004 (DAB Decision): This called for full rate production of seven variants and initial production of the Mobile Gun System (MGS) and the Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV).

October 2004 (1/25 SBCT deployed): 1/25 SBCT fell in on 3/2 SBCT vehicles. 1/25 drove over 2.5 million total miles in a 12 month period and maintained an ORR of over 95 percent

September 2005 (172 SBCT deployed): ORR data not available at time of publication.

November 2005 (Transition to Soldier Support Directive): Stryker Sustainment Readiness Review Memorandum is released directing the transition to a soldier field maintenance capability and transferring logistics information into the Army STAMIS Systems.

December 2005 (BCA Directive): A memorandum was sent to Program Executive Office Ground Combat Systems (PEO-GCS) from ASAALT directing a BCA on different courses of action for the transition from CLS to organic support of Stryker.

December 2005 (Contractor Replacement Analysis Directive): On 29 December 2005, another memorandum was sent from AAE to TRADOC directing analysis of which contractors are to be replaced with soldiers, and in what ratio.

February 2006 (Anniston and GD Reset Partnership): Anniston Army Depot, in Alabama signs a deal with its tenant, General Dynamics Land Systems, to repair Stryker infantry vehicles returning from Iraq. The partnership will cut costs by reducing duplications. Instead of three entities -the depot, TACOM Life Cycle Management Command and General Dynamics, all ordering spare parts for the Stryker, they will obtain parts through a single organizational structure.

April 2006 (FY06 Order of Strykers): The U.S. Army placed its fiscal year 2006 order for 306 Stryker wheeled combat vehicles. To date, approximately 1,500 Stryker Vehicles have been delivered of the 2,575 vehicles the U.S. Army plans for its fleet.

August 2006 (Modification of Contract): A Standard Form 30 Amendment of solicitation/modification of contract form is developed by TACOM and sent to GDLS to bring DLIS data into Army STAMIS, and use Army STAMIS only.

### The Chief of Staff of the Army Vision

General Eric Shinseki (see figure 7) became the Chief of Staff of the Army in the summer of 1999. In October 1999 he announced the interim brigade concept and offered the following challenge. “We must provide early entry forces that can operate jointly,

without access to fixed forward bases, but we still need the power to slug it out and win decisively.”<sup>10</sup>



Figure 7. General Eric Shinseki

*Source:* General Officer Management Office Retired General Officer Biographies

General Shinseki believed that it was his responsibility to satisfy twenty-first-century requirements for an effective full-spectrum force with improved capabilities. He said that rapid deployment of highly integrated, combined-arms forces is required. “They must possess overmatching capabilities, exploiting the power of information and human potential; all while combining the advantages of both light and mechanized forces. They must operate across the full range of military and other-than-military operations.”<sup>11</sup> He envisioned a force that would be lighter and more deployable than existing Army armor and mechanized units, but which would have vastly more punch than light infantry units such as the 82nd Airborne Division. General Shinseki, argued that the existing force was either too heavy to be deployed quickly (tanks and infantry fighting vehicles) or too light to be effective (airborne or light infantry). General Shinseki believed, and so stated

publicly, that advances in Sport Utility Vehicle (SUV) technology made wheeled vehicles virtually as capable both on and off-road as tracks, while being much lighter to deploy.<sup>12</sup>

### The Interim Armored Vehicle

The response to GEN Shinseki's challenge was the Interim Brigade Combat Team (IBCT) and the Interim Armored Vehicle (IAV). The IAV was to be the primary weapons platform for the IBCT. The IAV is a light armored vehicle (LAV) variant that represents an interim vehicle solution for the Army as it transforms toward a lighter more mobile force, pending the operational fielding of the future combat system (FCS). The IAV became the first new armored vehicle that the Army acquired in 18 years. It is a highly deployable-wheeled armored vehicle that combines firepower, battlefield mobility, survivability and versatility, with reduced logistics requirements. "The entire acquisition process was probably the fastest the army has ever accomplished for a major system acquisition; it now serves as a model."<sup>13</sup>



NOTE: The former Chief of Staff of the Army (CSA), General Shinseki, is in the center. From the left, there is COL David Ogg, MG N. Ross Thompson, Congressman Bob Riley (now Governor of Alabama), Nicholas Charbaja from General Dynamics, Senator Sessions from Alabama, an unknown top executive from GM of Canada, and LTG Caldwell.

Figure 8. Stryker Acquisition Senior Officials

Source: TACOM history office photo archives, Warren, MI, October 2002.

## From Interim to Stryker

On 27 February 2002 the Army formally named its new Interim Armored Vehicle the “Stryker” in a ceremony at Fort Lauderdale, Fla. The vehicle was named in honor of two Medal of Honor recipients: PFC Stuart S. Stryker, who served in World War II, and SPC Robert F. Stryker, who served in Vietnam. Effective immediately following the ceremony, the IAV became the Stryker, and the IBCT became the SBCT.

### The Stryker Organizational and Operational Concept

The SBCT is a brigade designed to provide the Army with a rapidly deployable force that is capable of operating against the full spectrum of military threats. It is strategically responsive, rapidly deployable, agile, versatile, lethal, survivable, and sustainable. It seeks to balance the traditional domains of lethality, mobility and survivability with the domains required for responsiveness, deployability, sustainability, and a reduced in-theater footprint. It will assist the Army in covering the capabilities gap between our legacy force heavy and light units. Significantly lighter and more transportable than existing tanks and armored vehicles, Stryker fulfilled an immediate requirement to equip a strategically deployable (C-17/C-5) and operationally deployable (C-130) brigade capable of rapid movement anywhere on the globe in a combat-ready configuration. The SBCT is designed to deploy and operate more efficiently with a “goal” of deploying the entire SBCT worldwide within 96 hours of the first aircraft wheels up. The Stryker is designed to enable the SBCT to maneuver more easily in close and urban terrain, while providing protection in open terrain.

The SBCT is designed to enter a permissive or semi-permissive environment and optimized primarily for employment in small scale contingencies. The SBCT is capable



of participating in major contingency operations but it must be augmented. In the initial stages of an operation, the SBCT is supported by a task-organized force provided by the Army Service Component Commander (ASCC). This force is often built on a tailored slice of the Theater Support Command (TSC). Operationally, the SBCT normally fights under a division or corps headquarters acting as the Army Forces (ARFOR) command, Joint Forces Land Component Command (JFLCC), or Joint Task Force (JTF) headquarters, within a joint or multinational forces command. In many contingencies, the SBCT will initially be the single US maneuver command operating under the ARFOR/JFLCC, although other multinational elements may be present. As a full spectrum combat force, the SBCT maintains an offensive orientation. However, depending on the nature and evolution of the contingency, it is capable of conducting all major doctrinal operations, including offensive, defensive, stability, and support operations. <sup>14</sup>

### Stryker Family of Vehicles

The Stryker is a 19-ton, eight-wheeled armored vehicle that provides the Army a family of ten different vehicles on a common chassis. (See Figure 9) The Stryker comprises two variants - the Infantry Carrier Vehicle (ICV) and the Mobile Gun System (MGS). The ICV has eight additional configurations: Mortar Carrier (MC), Reconnaissance Vehicle (RV), Commanders Vehicle (CV), Fire Support Vehicle (FSV), Medical Evacuation Vehicle (MEV), Engineer Squad Vehicle (ESV), Anti-tank Guided Missile Vehicle (ATGM), and NBC Reconnaissance Vehicle (NBCRV). The Infantry Carrier Vehicle carries a nine-man infantry squad and a crew of two and has a Remote Weapon Station with an M2 .50 caliber machine gun or MK-19, 40mm grenade launcher.



Figure 9. Stryker Family of Vehicles

Source: Program Manager SBCT Stryker Sustainment Readiness Review Briefing, Warren, MI, 24 Oct 2005, Slide 6

### Vehicle Performance Highlights

The Stryker provides soldiers with battlefield speed, situational awareness, and protection. The Stryker can travel at speeds up to 62 mph on highways with a range of 312 miles on 53 gallons of fuel. It operates with the latest C4ISR equipment. It has an integrated armor package protecting soldiers against improvised explosive devices, rocket propelled grenades and a variety of infantry weapons from 14.5mm projectiles and 152mm artillery airburst protection (upgradeable to Rocket Propelled Grenade (RPG) protection with add on armor).

The Stryker family of vehicles stresses performance and parts commonality that reduces the logistics footprint and minimizes sustainment costs. The same engine used in

the Family of Medium Tactical Vehicles (FMTV) powers the Stryker. The Stryker has self-recovery capability, a central tire inflation system, a reduced vehicle acoustic signature, and a bunker and wall breaching capability. These performance highlights provide a force that will move rapidly as a cohesive combined arms combat team, a capability not currently in the Army inventory. These attributes make the Stryker the Army's first true system-of-systems, and enable the SBCT's unique organic combined arms capability.

### Sustainment Strategy for Stryker Vehicles

To meet the Army's requirements for being rapidly deployable and combat capable, the Stryker brigade relies on new sustainment concepts such as:

1. Self-sustained operations for 72 hours.
2. Echelons above Brigade (EAB) reliant beyond 72 hours.
3. Heavy use of Unit Basic Loads (UBL).
4. On-system repair enablers.
5. Reliance on whole item CL VII/ Operational Readiness Float (ORF) replacement.
6. Scheduled pulse of supply/services distribution every other day (not daily).
7. Limited logistics surge capability.

The main enabler in meeting these goals is minimizing the number of personnel and spare parts within the brigade and reaching back to assets outside the brigade for support not found in other existing Army brigades. The initial answer to this was CLS (CLS). The Stryker CLS contract covers both supply and maintenance of contractor furnished equipment (CFE) for all fielded vehicles. It is a cost-plus fixed fee (CPFF) contract executed by PM SBCT.

The Army went with CPFF for a couple of reasons. First, the Army did not know what it would cost to achieve certain OR rates, so GDLS was not incentivized to achieve anything above 90 percent. The Army could have added an incentive for 92 percent and another for 94 percent, etcetera, but would have ended up paying twice: once for GDLSs cost for achieving those rates and then the incentive on top of that. So the Army went with CPFF until we got a sense of how much the various levels of performance would cost, and planned later go to a Firm-Fixed Price (FFP) contract with incentives for various levels above the 90 percent baseline. 15

The contract provides coverage for all fielded vehicles in garrison or deployed. It currently covers eight Stryker configurations, and will be extended to the remaining two configurations upon fielding. The contract is “performance-based” The basic metrics are a 98 percent monthly OR rate during fielding and training exercises and a 90 percent OR metric in garrison. The contractor performs unscheduled maintenance and scheduled services for all Stryker vehicles. GDLS performs scheduled and unscheduled services during New Equipment Training (NET) and training exercises. GDLS has a team of 8 embedded mechanics in the CRT, 14 in the BSB, 14 in the EAB, 16 in the Forward Repair Activity (FRA), and 5 in the European Distribution Center (EDC).

GDLS supplies all parts under a PBL contract using a warehouse in Auburn, Washington. Inherent to managing this warehouse, they perform all requirements determination and inventory management functions down to the Authorized Stockage Lists (ASLs) and Prescribed Load Lists (PLLs) within the SBCTs. GDLS manages repair of all returned unserviceable items and is responsible for repair of all Stryker specific components outside of the BCT. They use a unique system called Data Management Information System (DMIS) in which requisitions and other logistics information move from units to GDLS. GDLS has supply clerks embedded in the SBCT as an interface to

DMIS. Extracts are made DMIS and passed to Army systems in formats specified by the Army.

GDLS ships on Government Bills of Lading (GBL) to garrison units or to a designated Aerial Port of Embarkation (APOE) for deployed units or uses premium transport, either commercial (DHL) or TRANSCOM's World Wide Express (WWX), as appropriate. A model of how this works is depicted in figure 10.

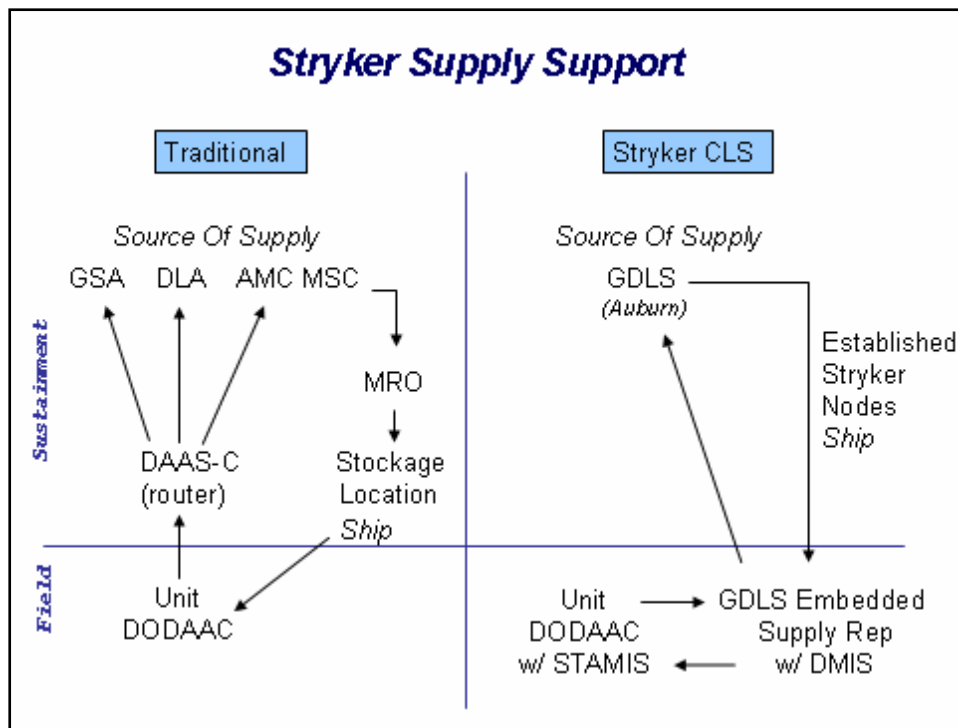


Figure 10. Stryker Supply Support

Source: Program Manager SBCT Stryker Sustainment Readiness Review Briefing, Warren, MI, 24 Oct 2005, Slide 21.

## Sustainment Strategy for vehicles and equipment other than Stryker

The SBCT maintenance strategy is based on a two tier maintenance system with field and sustainment maintenance. This maintenance concept differs significantly from how maintenance was performed under the old four-tiered system of organizational, direct support, general support, and depot level maintenance. Under the two-tiered system organizational and direct support maintenance are combined into field maintenance. Field maintenance tasks are those that directly return the system to an operational status and are performed in the battle space. Sustainment maintenance tasks are those that support the supply system.

This new system provides more capability per maintainer and reduces the number of maintainers in the area of operations (AO), thus reducing the logistics footprint. Additionally, all maintenance capability, with the exception of unit level communications, small arms (unit armorer), UAV (Unmanned Aerial Vehicle), and radar operator maintenance, is resident in the Forward Maintenance Company (FMC). Under this system, the maneuver battalions no longer have their maintenance platoons, but receive support from Combat Repair Teams (CRTs) managed by the FMC's Maintenance Control Section. These CRTs have fewer people and their focus is on quick fixes and component replacement. Another limitation to this maintenance concept is there are fewer recovery assets in the FMC. As a result, the primary method of recovery in the SBCT is self and like vehicle recovery from the point of damage or breakdown to the CRT location or maintenance collection point (MCP).

## The Brigade Support Battalion

The Brigade Support Battalion (BSB) headquarters and its staff direct the battalion's command, control, computer, intelligence, surveillance, and reconnaissance (C4ISR) functions. See figure 11 for a depiction of the organizational chart. The battalion staff has a Command Section, S1, consolidated S2/3, S4, S6, and a Unit Ministry Team (UMT) who all assist the commander in managing the internal operations of the BSB. The BSB HQ has command and control of all organic and attached units in the BSA for security and terrain management. The staff plans, directs, and supervises the administration, training, and internal logistics support for units organic and attached to the battalion. In addition to the battle staff, there is a Support Operations Section (SPO) that serves as the logistics integrator for the entire SBCT. The SPO manages the distribution of all classes of supply and services for the SBCT.

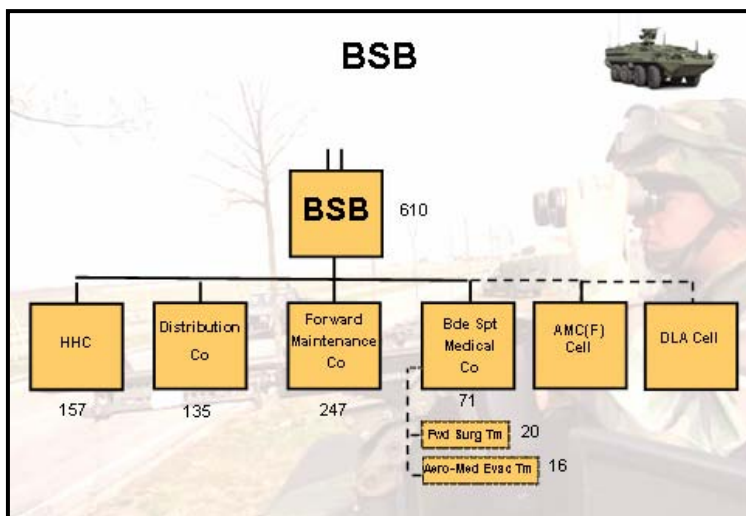


Figure 11. The Brigade Support Battalion

*Source:* Command and General Staff College, Department of Logistics and Readiness. Instructional Presentation, AY-2007, Fort Leavenworth, KS.

## The Forward Maintenance Company

The Forward Maintenance Company (FMC) provides all maintenance support for the SBCT, less medical and the limited automation capability found in the brigade's S6 section and the Signal Company. It does not have the organic capability to perform unscheduled maintenance and scheduled services on the Stryker vehicles. It can not sustain the Stryker vehicles readiness requirements without augmentation from GDLS contractors.

Structurally, the FMC is comprised of a Company Headquarters, Maintenance Control Section, Recovery and Classification Platoon, Wheeled Vehicle Repair Platoon, Maintenance Support Platoon, and five Combat Repair Teams (CRTs).<sup>16</sup>

The FMC is capable of performing automotive, armament, missile, communications, special devices, and ground equipment repair. The essential maintenance task for the FMC is to maintain SBCT equipment at the Army Maintenance Standard before entering the battle space, and once in the battle space through the replacement of line-replaceable units (LRU's), components, and major assemblies. The FMC returns equipment to mission capable status through the use of Class IX repair parts, BDAR, controlled substitution, and cannibalization when authorized. Class IX repair parts are carried throughout the SBCT battle space to perform field maintenance.

The FMC conducts maintenance operations for the SBCT both forward and at the brigade support area (BSA). CRTs conduct maintenance operations forward and are normally co-located with the unit they support. BSA based maintenance sections provide field maintenance on an area basis to the BSB and brigade separate companies, as well as back-up support to the CRTs and maneuver battalions.



The FMC uses new digitized technology and CSS enablers developed for the Force XXI Division that enhance its ability to execute its mission more efficiently and with optimal effectiveness. The FMC uses the Forward Repair System (FRS) to provide field level maintenance. The FRS is a HEMTT-LHS flattrack-mounted maintenance shop that provides storage locations for general mechanics tool kits, Battle Damage Assessment Repair (BDAR) kits for the mechanized fleet, and the soldiers' portable on-system repair tool (SPORT). It is capable of lifting engines/power packs and other major assemblies with its organic 5.5 ton capacity crane. There is one FRS per CRT. For an organizational depiction of the FMC, see figure 12.

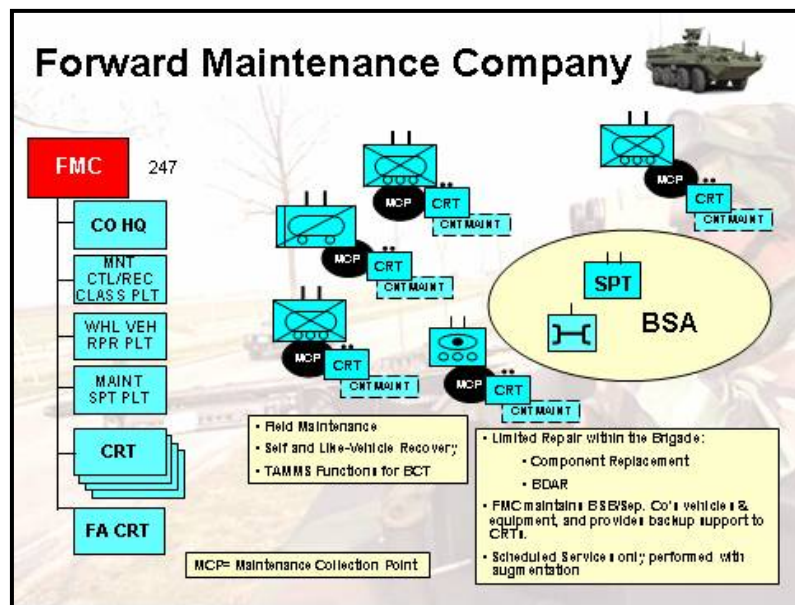


Figure 12. The Forward Maintenance Company

Source: Command and General Staff College Department of Logistics and Readiness, Instructional Presentation, AY-2007, Fort Leavenworth, KS.

The Company Headquarters: is located in the BSA and provides command and control for all assigned or attached personnel. In addition to C2 responsibilities, it is responsible for unit-level supply but lacks any capability for internal personnel, or financial support. It is responsible for managing the task organization and employment of all maintenance assets to include CRTs' contact missions and recovery assets. It is also responsible for collaborating and coordinating with the BSB Support Operations Officer (SPO) and SBCT S4 to determine the best maintenance concept of support for the SBCT. The FMC's Maintenance Control Section assesses all vehicles requiring evacuation to determine if they can be returned to a mission capable status.

The Wheeled Vehicle Repair Platoon: Provides field maintenance for the organic wheeled vehicles in the SBCT and all supported units within the BSA. It is work loaded by the Maintenance Control Section. The platoon also performs equipment and component troubleshooting, provides back-up maintenance to the forward CRTs, and employs the replace forward/repair rear maintenance philosophy. In addition, the Wheeled Vehicle Repair Platoon maintains a limited quantity of bench stock while the Maintenance Control Section maintains its Class IX repair parts. It also utilizes controlled component substitution and cannibalized spares obtained from non-repairable vehicles.

The Maintenance Support Platoon: Consists of the Armament Repair Section, Ground Support Equipment Repair Section, and the Missile/Electronics Repair Section.

The Armament Repair Section: Provides field maintenance on all armament related equipment to include turrets, fire control systems, small arms, sight units, and artillery within the brigade. The Maintenance Control Section will make a determination on sending out an Armament Maintenance Support Team to make forward repairs or

have the equipment evacuated to the BSA. The Armament Repair Section maintains Class IX bench stock to sustain its mission.

The Ground Support Equipment Repair Section: Provides field maintenance for all the SBCT's non-vehicular environmental control, power generation, water purification, POL, and engineer equipment. It works primarily from the BSA.

The Missile/Electronic Repair Section: Provides field maintenance to the brigade's missile and electronic equipment/weapon systems. This section has two distinctly separate missions: missile weapon system maintenance and communications-electronics maintenance. The section inspects, performs troubleshooting and repairs on Javelin, TOW II, improved target acquisition system, radio/COMSEC, special devices, night vision devices, computer automation systems, and radars.

#### The Combat Repair Team

Five Combat Repair Teams (CRTs), assigned to the FMC, provide forward field maintenance and are allocated on the basis of one per maneuver battalion (one each for the three Infantry Battalions, and one for the RSTA Squadron), and one for the Field Artillery (FA) Battalion. The CRTs are located forward in the vicinity of the task force medical platoon or command post. They operate in direct support of the maneuver/FA battalion S4 section, receive their priorities from the battalion S4/XO, and are fully integrated into the unit's OPLAN. A principal task of the CRT is to assess and report maintenance requirements to the MCS. The teams identify faults, advise unit S4s regarding forward maintenance management, and conduct component and major assembly replacement for supported equipment. A daily delivery of Class IX repair parts to the CRT is required to facilitate continuous forward maintenance operations. The FMC

Maintenance Control Officer, who coordinates with supported units S4/XO to establish work priorities, control movements, and integrate CRT operations into the units planning, controls the CRTs, not the supported unit.

### The Logistics Support Element Forward

For the SBCT, the single face of external materiel support is the commander of the LSE-F. The SBCT LSE-F is a task-organized team consisting of a chief warrant officer and Department of the Army civilian technicians from Army Material Command's (AMC) Major Subordinate Commands (MSC). Each LSE-F is provided with a multimedia communication system (MMCS) and contract operators for training exercises and deployments. The LSE-F MMCS consists of 48 secure and non-secure voice data lines and fax, non-secure video, cellular transmissions, terrestrial lines, and satellite bands and is interoperable with the Defense Switched Network and commercial telephone service.<sup>17</sup> Figure 13 is a diagram of the organizational structure of the LSE.

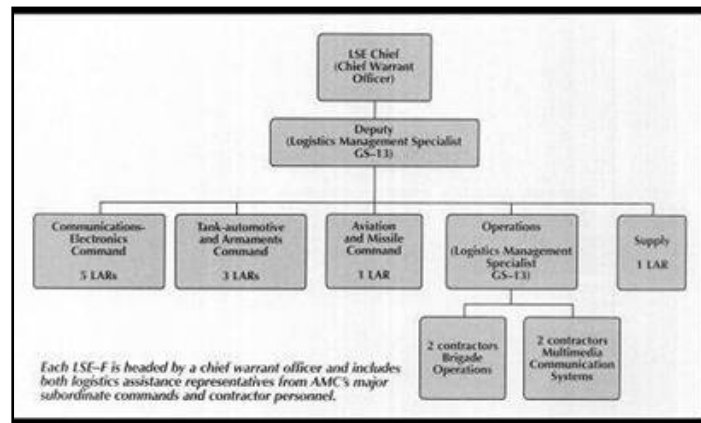


Figure 13. Logistics Support Element Forward  
 Source: *Army Logistician*, 37,no, 2 (March-April 2005): 8.

Historically, AMC has deployed LSEs based on the operational needs of the supported unit or theater. The LSEs are task organized with logistics assistance representatives (LARS) assigned to logistics assistance offices worldwide. During contingencies, command and control of LSEs transfers to the theater AMC forward commander. Unlike the traditional LSE, an SBCT LSE-F maintains a habitual, direct support relationship with its SBCT during both peacetime and contingency operations. This ingrained familiarity has proven to be a combat multiplier as operational proficiency is routinely rehearsed and reinforced. An inherent mission under this concept of support is the mobilization and operational control of approximately 115 to 150 SBCT contractors and Department of the Army civilians.

#### Army Material Commands Forward Stryker

The Commanding General of the Army Materiel Command (AMC) and the Program Executive Officer (PEO) for Ground Combat Systems agreed to provide Fort Lewis with a single point of contact for all materiel fielding issues associated with the SBCT. The I Corps Transformation Support Office was created in March 2001 to serve as that single point of contact for the materiel development community. The Chief of the Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Special Projects Office, a temporary field office of the PEO for Command, Control and Communications Tactical located at Fort Lewis, was dual hatted as the Director of the Transformation Support Office.

In the fall of 2002, AMC's Operations Support Command (OSC), which became the Army Field Support Command (AFSC) and is now called the Army Sustainment Command (ASC) established AMC Forward Stryker, a colonel-level command, to

assume the materiel fielding and command and control mission for all six SBCT AMC logistics support elements forward (LSE-Fs). In June 2003, AMC published the SBCT Fielding and Support Concept. This concept provided an overarching approach to coordinating and synchronizing the fielding of the SBCTs, including AMC's sustainment responsibilities after fielding is completed. In November 2003, the Army Deputy Chief of Staff, G-8, assumed materiel fielding responsibility for SBCTs and AMC Forward Stryker's focus was redirected to standing up the LSE-Fs through certification of their initial operating capability. See figure 14 for a depiction of this organization.

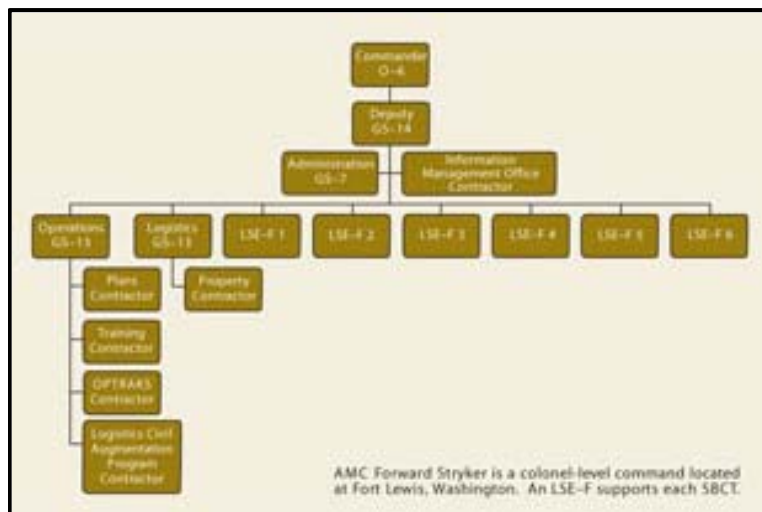


Figure 14. Army Material Command Forward Stryker

Source: *Army Logistician* Fort Lee: Vol. 37, Issue. 2, (March/April 2005): 8

### General Dynamics

General Dynamics is one of largest companies in the world and is the recognized market leader in the ground combat vehicle sector. Headquartered in Falls Church, VA, the company employs over 70,000 people around the globe with 2004 sales exceeding

\$19 billion across its four main market segments: marine systems, combat systems, aerospace and, information systems and technology.<sup>18</sup> General Dynamics further divides the combat systems segment into four additional divisions: Land Systems, European Land Combat Systems, Ordnance and Tactical Systems, and Armament and Technical Products. It is within the Land Systems and European Land Systems divisions that ground combat vehicles are produced and sold to the U.S. military and other international customers.

General Dynamics Land Systems (GDLS) provides a full spectrum of land and amphibious combat systems and subsystems worldwide. GDLS core competency lies in its design and systems integration, advanced production techniques, and innovative life cycle support. Headquartered in Sterling Heights, MI, GDLS employs 7,800 people in 11 states, generating approximately 23 percent of General Dynamics' annual sales in 2004.<sup>19</sup> Wheeled combat vehicles constitute the largest segment of the Land Systems business. The GDLS combat vehicle product line consists of the following systems: Abrams Main Battle Tank (MBT), the Light Armored Vehicle (LAV), the Stryker, the Fox Nuclear Biological Chemical Reconnaissance System, the Expeditionary Fighting Vehicle (EFV) and the Future Combat Systems (FCS) Program.

Through a combination of company-owned, leased, and government-owned facilities, GDLS maintains sufficient capacity to fulfill current production requirements. In fact, the firm currently carries considerable excess capacity and facilities (particularly at its overseas production facilities) that could be used to meet surge production and ramp-up requirements if needed. Although GDLS incurs the overhead cost associated with excess capacity, it attempts to offset it with production efficiencies. Assisting the

company in this regard are the benefits GDLS derives from using a number of Government-Owned, Contractor- Operated (GOCO) facilities. The Joint Systems Manufacturing Center in Lima, OH, and the Anniston Army Depot in Anniston, AL are two such facilities.

Financial Analysis of General Dynamics: At the corporate level, General Dynamics is a profitable and well-managed defense firm. The overall financial strategy of the company is to focus on earnings, cash flow, and return on invested capital. A strong balance sheet and other financial statements support this approach. The company's profit margin for 2004 was solid while its Return on Equity (ROE) was a very respectable 108 percent – considerably higher than the industry's average of 13 percent. The company's ability to generate income on owned assets was also formidable in 2004. The bulk of the company's revenue is derived from its domestic and international defense business, representing 81 percent of total sales in 2004.<sup>20</sup> The company achieved \$19.2 billion in gross sales for 2004 – an increase of 17 percent from 2003. Net income increased by 22 percent, climbing to \$1.23 billion or up from \$1 billion in 2003. GDLS attributes the majority of its recent growth to its corporate acquisitions and operating performance of its Combat Systems and Information Systems and Technology Divisions.<sup>21</sup>

The Combat Systems Division performed extremely well for General Dynamics in 2004, accumulating revenues of \$4.4 billion. This represents 23 percent of General Dynamics' total revenue and an increase of 10 percent from 2003. Net earnings increased by 18 percent to \$522 million.<sup>22</sup> The key programs fueling GDLS earnings growth include vehicle sales, product enhancements and after-market support connected to



wheeled systems – particularly Stryker, LAV, FOX NBCRS and, the M1 Abrams tank (rebuilds upgrades and replacements). Current defense funding and contracts related to the Army’s transformation initiatives and the Global War on Terrorism (GWOT) have favorably affected the firm’s revenue position. Among these are Future Combat Systems (FCS) and the Marine Corps Expeditionary Fighting Vehicle (EFV).

GDLS tries to minimize fixed costs by using GOCO facilities, and infusing capital investments into its manufacturing and production processes. These investments are targeted typically at the integration of the latest technology and state-of-the-art machines, tools, and processes. With respect to manufacturing certifications, techniques and initiatives, GDLS leads the U.S. LCS industry. They have implemented lean manufacturing techniques in their plants to eliminate waste and reduce production and assembly times while increasing quality. The company relies heavily on engineering modeling and simulation techniques to improve design, product development, and production processes. GDLS’s quality management system is ISO 9001 registered, SEI Level V certified, and it continually seeks to integrate new technologies and welding techniques into their production processes. Finally, GDLS’s use of progressive management techniques and supply chain information technology improve customer satisfaction while minimizing production costs. Based on the firm’s global business, future growth expectations, and other financial data, it appears General Dynamics is positioned well to continue to lead the LCS sector and be a major player in the overall defense industry.

This concludes the literature review. This literature review has provided a baseline of the fundamental topics of PBL and Stryker; however, the knowledge obtained

is not sufficient to answer all of the primary and secondary questions presented in chapter 1. Further study is needed in addition to the knowledge in the published literature because PBL appears to be on track towards achieving true acquisition reform. The CLS sustainment strategy for Stryker also appeared to be very successful. It is imperative to understand what went wrong, and why the sustainment strategy was changed. So now that there is a baseline of PBL and Stryker, and just about all of the fundamentals associated with the two subjects, this thesis will proceed with a methodology to take a closer look at the primary and secondary questions.

---

<sup>1</sup>U.S. Department of the Army, Army Regulation 700-127, Integrated Logistics Support, Washington, D.C.: U.S. Government Printing Office (19 January 2006): 1.5.

<sup>2</sup>USDATL Memorandum, March 2003, TLCSM & PBL, p. 9.

<sup>3</sup>Defense Acquisition University, *Defense Acquisition Guidebook* , 17 October, 2004

<sup>4</sup>U.S. Department of the Army, Army Regulation 700-127, Integrated Logistics Support, Washington, D.C.: U.S. Government Printing Office (19 January 2006): 1.6

<sup>5</sup>As defined in a road-show briefing prepared by the Office of the Deputy Assistant Secretary of the Army for Integrated Logistics Support (ILS)

<sup>6</sup>PBL benefits that are listed in the Defense Acquisition University, *PBL Student Guide*. Ft. Belvoir, VA, Defense Acquisition University Press, 2003

<sup>7</sup>U.S. Defense Acquisition University, *PBL Student Guide*. Ft. Belvoir, VA, Defense Acquisition University Press, 2004

<sup>8</sup>Defense Acquisition University, *Defense Acquisition Guidebook* , Defense Acquisition University Press, 17 October, 2004 paragraph 5.3.2.

<sup>9</sup>Keating, Scott “Managing Risk in the New Supply Chain” *Engineering Management*; Vol. 15 Issue 1, (Feb/March 2005): 24-27

<sup>10</sup>General Eric Shinseki, AUSA Speech, Washington D.C (October 1999)

<sup>11</sup>General Eric Shinseki, AUSA Speech, Washington, DC, October 1999.

<sup>12</sup>Stryker and Reality of War, Victor O'Reilly for Congressman Jim Saxton, D21 Aug 22, 2003

<sup>13</sup>LTG Caldwell, telephone interview with author, Ft. Leavenworth KS, 19 October 2006.

<sup>14</sup>U.S. Department of the Army, FM 3-21.31 SBCT, Washington, D.C.: U.S. Government Printing Office (March 2003)

<sup>15</sup>PM SBCT official, Warren Michigan, Stryker and PBL, Electronic mail message to author, 16 November 2007

<sup>16</sup>U.S. Department of the Army, FM 3-21.31 SBCT, Washington, D.C.: U.S. Government Printing Office (March 2003)

<sup>17</sup>Alderete, Gregory L. "Nonstandard Logistics Sustainment Support in the Stryker Brigade Combat Teams." *Army Logistician* Fort Lee: Vol. 37, Issue. 2, (March/April 2005): 6-8

<sup>18</sup>General Dynamics Public website

<sup>19</sup>General Dynamics, Land Systems Briefing, Anniston, Alabama, 3 March 2005.

<sup>21</sup> Statistics from "Land Combat Systems Report", Industrial College of the Armed Forces Study 2005

<sup>22</sup> Kenneth Flamm, "Post Cold War Policy and the U.S. Industrial Base", Volume 35, Number 1 – Spring 2005, p.2/3.

## CHAPTER 3

### METHODOLOGY

#### Agencies to be Contacted

Subject matter experts on PBL and Stryker CLS will be contacted primarily through the use of electronic mail and phone calls, about the questions previously listed under each sub problem in chapter 1, and again at the end of this chapter. The comments of these subject matter experts will be included when appropriate. To be considered for this study, the respondents need to have a solid working knowledge of the concepts of PBL and Stryker CLS. Those with little to no knowledge of the PBL concept or Stryker CLS will be omitted. All respondents will be considered truthful with their comments under non-attribution conditions. The top subject matter experts (SMEs) working on PBL in ASAALT, AMC, DAU, TACOM, PEO GCS, and PM STRYKER, will be selected. Points of contact (POCs) will be identified from three levels (upper management, middle management and functional) for each agency. Current and former Stryker BCT commanders and logisticians will also be contacted for their views and opinions. Not all questions will be asked to all persons. Only the questions related to their area of expertise will be asked.

Assistant Secretary of Army, Acquisition, Logistics and Technology

SMEs from the office of the Assistant Secretary of the Army, Acquisition, Logistics and Technology (ASAALT) must be contacted because the ASAALT serves, when delegated, as the Army Acquisition Executive, the Senior Procurement Executive, the Science Advisor to the Secretary, and as the senior research and development official

for the Department of the Army. The ASAALT has the principal responsibility for all Army matters related to logistics.

#### Army Material Command

The Army Material Command (AMC) overhauls and upgrades thousands of pieces of Army equipment. They provide on-the-ground logistics assistance to every unit in the Army, including new equipment training. AMC supports the acquisition of billions of dollars worth of end items and parts for more than a thousand weapon systems. The Army Material Command co-chairs the Army PBL IPT with ASAALT. It will be absolutely imperative to obtain SME's and information from AMC for this study to be complete.

#### TACOM Life Cycle Management Command

TACOM is at the forefront of PBL and was one of the first Army Life Cycle Management Commands to begin to implement it. They have been working hard to make PBL work. As the head of PEO Ground Combat Systems, and PM Stryker, there are many POCs at TACOM that will need to be contacted for assistance in answering the research questions.

#### Program Executive Office Ground Combat Systems

PEO GCS is responsible for developing, acquiring, fielding and sustaining the Army Ground Combat Systems. Some of the systems include: the Abrams tank systems, the Bradley Fighting Vehicle systems, the Stryker Brigade Combat Team vehicles, Joint Lightweight Howitzer and Robotic Systems. Obviously contacting SMEs in this agency will be crucial for this study.

### Program Manager Stryker Brigade Combat Team

PEO Stryker Develops, produces, fields, and sustains the full range of safe, reliable, supportable, and effective systems envisioned by the Brigade Combat Team Organizational and Operational Concept for Initial and Interim Brigades, while developing the acquisition and program management framework to transform the Army. PM SBCT has already assigned supply, maintenance, and funding teams to oversee this transition. Interaction with these teams will be crucial for this study.

### Defense Acquisition University

It is important to get opinions from the PBL experts at DAU because DAU is the corporate university for the DOD Acquisition, Technology and Logistics (AT&L) workforce. The most important schools of thought on PBL are found in DAU. DAU is the instructional proponent for PBL and offers many courses on the subject.

### Current and Former Stryker Commanders

It is important to get the opinions from some former Stryker Support Battalion Commanders because they can provide first hand accounts of how CLS and PBL worked with Stryker and the challenges associated with it. It is important to get the opinions from current Stryker Support Battalion Commanders because they are the ones who will oversee the transition from CLS to Organic support.

### Current and Former Stryker Logisticians

It is important to get the opinions from former Stryker logisticians because they were the ones who experienced the challenges of CLS firsthand.

### Questions to ask the Subject Matter Experts

The answers to the questions below will provide the data needed to answer the primary question and address the issues in the problem statement.

1. What were the factors that drove the decision to modify the Stryker CLS contract? In other words, why did the Army change the Stryker support strategy?
2. Is CLS too expensive to maintain for Ground Combat Systems?
3. What are the hurdles to overcome with respect to integrating CLS and PBL into the Army financial processes?
4. Is CLS flexible enough in the Contemporary Operating Environment (COE)?
5. Is CLS flexible enough on the traditional linear battlefield?
6. Are there cultural implications that prevent CLS from being fully implemented with ground combat systems?
7. Is CLS for ground combat systems no longer a viable support strategy for the Army?
8. Is CLS only a temporary support strategy to get new ground systems fielded quickly?
9. If CLS did not work long term for Stryker, will it work long term for other new systems?
10. Or did it work, but other factors drove the decision to switch to organic support?  
What were those factors?
11. How can the Army successfully adapt to, and overcome CLS challenges with Ground Combat Systems?
12. What new challenges are created by transitioning from contractor to organic support?

13. Will the organic strategy still be considered a PBL arrangement? In other words, with organic support alone, or even limited contractor support, are there sufficient measurable aspects that can still be defined as PBL?
14. How will the Army's ability to replace contractor personnel with soldiers be affected by personnel challenges, particularly with respect to the recruitment and retention of additional soldiers?
15. How will the Army sustain soldier skills and knowledge on Stryker vehicle maintenance with only seven SBCTs for these special skilled soldiers to serve in?
16. Will the increased size of the brigade resulting from additional soldiers still allow the SBCTs to meet their 96-hour deployment goal?

This ends the methodology chapter. The methodology chapter has outlined the data needed to adequately address the primary question. The chapter presented the method the researcher plans to use for obtaining that data. The next chapter will analyze the results of these respondents as well as the secondary data from the literature review in chapter 2.



## CHAPTER 4

### ANALYSIS

#### Introduction

There were a total of forty-two subject matter experts (SMEs) contacted from the eight government agencies identified in chapter 3. Initial contact was made by electronic mail. The questions asked to each SME were focused and only pertinent to his or her area of expertise. Electronic mail reminders were sent in an attempt to involve participants who did not respond initially. Seven of those who did not respond to the initial request did not respond at all. Follow-up telephone interviews were conducted to obtain clarification and insight into additional areas of interest that surfaced in email responses. The results are grouped by interview question. The data presented is a combination of information obtained from the email responses and the follow-up telephone interviews.

#### The Army's Reason for the Support Strategy Change

Why did the Army change or modify the Stryker CLS support strategy? The Army directed that the Stryker vehicle maintenance contractors embedded at the brigade level be replaced with soldiers in order to increase the SBCTs flexibility to perform in different combat operations.<sup>1</sup> Army officials stated that the plan to transition to soldier maintenance is based on the Army's preference to minimize the number of contractors in forward locations in order to increase flexibility in different combat situations. Army officials specifically cited the march to Baghdad conducted by other Army units during Operation Iraqi Freedom as the type of combat operation the brigade could have the flexibility to perform with the transition from contractor to soldier maintenance.<sup>2</sup>

The support strategy was not changed suddenly. “The strategy is being altered to meet the Vice Chief of Staff of the Army’s direction to meet Title 10 Requirements. The Army must maintain core repair requirements, and provide unit commanders spare/repair part visibility through the Standard Army Management Information System (STAMIS).”

<sup>3</sup> PEO Stryker maintains that the performance outcomes will change as well as some of the support requirements, but for the most part the PBL contract will still have a major CLS component as part of the total requirement. More than likely this will take the form of order-ship-time performance metrics tied to GDLS supplying repair parts.

There were two reasons for the current transition plan. 1) The original concept was for interim support only; 2) There are possible future political limits similar to what was realized for re-stationing the 2<sup>nd</sup> Armored Cavalry Regiment to Germany. The Army and the US Government had to get special permission from the German Government to allow US contractors to come in and do the CLS work. Vice having GDLS hire all or almost all local German workers.<sup>4</sup>

#### Cost of Contractor Logistics Support was not the Primary Reason

Is CLS too expensive to maintain? No, the decision to transition to Organic sustainment for Stryker was not predicated on the costs of providing support.<sup>5</sup> The Army has never been able to really document exactly what it costs to induct, train, equip, clothe, and house each individual soldier.<sup>6</sup> By contrast, the Army knows exactly what it costs to perform Stryker CLS because the dollar value is right on the contract. So which is cheaper is still the subject of debate. It cost the Stryker Program Office \$6.00 less per pound to ship by DHL direct to Mosul rather than by Milair to Balad.<sup>7</sup>

#### Business Case Analysis Results

A Business Case Analysis was done per order of the VCSA. The cost estimate used in the analysis focuses on Stryker vehicles only and reflects the incremental cost to

the Army. This analysis was based on peacetime operations. It was also based on soldiers replacing contractors on a one-to-one, full-time equivalent basis. Three baselines were compared. Status Quo (nothing changes), Complete Organic, and a mix. These baselines are explained as follows: Status Quo: The contractor performs all unscheduled maintenance and scheduled services for Stryker vehicles. Organic: Transition from contractor maintainers to Soldiers for all field-level Stryker unscheduled maintenance and scheduled services. Combined: Field unscheduled maintenance is performed by Soldiers. Retain contractor personnel for scheduled services


 <b>Cost Summary</b> (FY08-27) FY06 Constant \$s			
	MANPOWER	SUPPLY SUPPORT	MAINTENANCE PLANNING
<b>STATUS QUO</b> (\$4,172.5 M)	\$935.8 M	\$1,850.9 M	\$1,385.8 M
<b>ORGANIC</b> (\$3,784.7 M)	\$531.3 M	\$1,910.3 M	\$1,343.1 M
<b>COMBINED</b> (\$3,990.7 M)	\$711.2 M	\$1,909.9 M	\$1,369.6 M
<b>Cost of Recommendation = \$3,810.8 M</b>			10

Figure 15. Business Case Analysis Results

Source: Program Manager SBCT, Stryker CLS Briefing to 39th Annual DoDCAS, Warren Michigan, 15 February 2006.

BCAs can be manipulated to show just about any conclusion. The Stryker does have a matrix level for various degrees of support with the cost associated with that level. Unfortunately the dollars available drive the level of support chosen and is not necessarily the most optimal level of support.

You get what you pay for, but in PBL you get more for your money than in a non-PBL. Some complain that PBL is ‘too expensive’, but that’s because it is a contract, with some implied obligation to pay the contract cost. With organic support, the funds are fragmented and frequently cut – there is no funding accountability or good audit trail – and the results are generally not outstanding. PBL makes the cost more visible, therefore it is obvious when funds are “cut”, which most fund owners do not like (accountability!!).<sup>8</sup>

Many TACOM officials disagree with this opinion. A PBL is not too expensive because it is a contract, but because of the potential commitment of limited dollars to one weapon system (if fully funded) to the detriment of all others. Organic support funding is not that fragmented, and is not cut any more than money that is available to fund PBLs.

The Stryker on this last contract had to severely limit its PBL contract because the dollars were not there. A PBL can make the cost more visible because a total cost is negotiated up front. In organic support, items are procured as they reach their reorder point or as needed not as a total weapon system support package. Because the PBL is meeting performance requirements and the contract cost seems low doesn’t mean the funds are managed effectively.<sup>9</sup>

### Part I: Stryker Contractor Logistics Support Challenges

What are the challenges with the Stryker CLS support strategy? There are three primary challenges identified with Stryker CLS; Financial Integration, Flexibility, and Culture Change. Each of these primary challenges has numerous sub challenges. These challenges are described in detail below.

## Financial Integration Challenges

What are the hurdles to overcome with respect to integrating CLS and PBL into the Army financial processes? One of the biggest hurdles in institutionalizing PBL is in the financial arena. The financial challenges of implementing PBL are numerous. The four main financial challenges are; lack of policy, the many colors of money, working capital funds, and the expiration of funds. These challenges are explained in greater detail below.

### Lack of a Performance Based Logistics Financial Policy

Financial management policy is often identified as a barrier to PBL implementation because PBL has multiple funding sources, each with its own constraints. The restrictions on the use of Operations and Maintenance Army (OMA) funds, expiration of funds, and the traditional flow of funds through the operation commands to buy support on a transaction basis are all complicated under different PBL arrangements. Existing financial processes support functional stovepipes and are viewed as inhibiting needed integration to improve customer service. Financial policy lacks clear guidance on funding long term PBL arrangements with one year funding.

A Management Initiative Directive (MID) 917 outlines significant financial policy and process revisions that can significantly enhance the ability of the PM to oversee PBL support funding. MID 917 states the following:

The MILDEPS shall realign PBL resources from functional PE's into the PE that finances the system the PBL agreement supports” “The MILDEPS shall identify single lines of accounting in their O&M appropriations for financing O&M requirements for the pilot PBL programs and shall consolidate and realign O&M PBL program resources into these single lines in each applicable O&M appropriation.

Under MID 917, funds will be budgeted for PBL programs in the applicable weapon system PEOs in the Operations and Maintenance account, rather than across the usual functional PEOs. Then, when those funds are appropriated, they will be appropriated the same way – to specific weapon system PEs. This does not change to whom the funds are appropriated. The funds will still go to the force provider, not the PM. However, this process makes the system funding very visible. In the past, Services could move execution year funds around, with significant impact on some programs, without much visibility outside of the Service. They could do this because the funds were appropriated by broad functional elements, not by weapon system. Now, although technically they can still do this, the results will be explicitly visible to Congress, the Service, and the public. Budgetary cuts to a program will now be a much more politically risky action because once the funds are paid to a PBL PSI, they essentially become colorless and “no year.” The contractor now has the flexibility to expend the funds however they choose. The problem with this approach is that the army will still have “colors” of money, which is discussed next.

#### Different Colors of Money

Which pot of money does PBL and CLS use? Is it OPTEMPO or GWOT OMA or Regular OMA or the AWCF? DOD funds are broken down into various types of appropriation accounts: Procurement, Research, Development, Test, and Evaluation (RDT&E), Operations and Maintenance (O&M), Military Construction (MILCON), and so forth. Within each of these appropriations, funds are further separated into various lines of accounting depending on the functional area or product to which they have been allocated. Each appropriation type has statutory time limits on use. Procurement funds are

good for three years, RDT&E two years, and OMA for one year. This creates problems because almost all of the activities funded by these different colors of money are used for the effective support and sustainment of DOD weapon systems.

DOD believes program managers should be able to respond to funding fluctuations by using either procurement or operation and maintenance appropriations to fund PBL when the opportunity arises. The entire GDLS support system has been funded centrally through the PM SBCT currently using Operations and Maintenance Army (OMA) funds. In essence, parts are free issue to the units. Essentially, the units OMA TRM funding allocations, which are projected annually for Stryker requirements, go to PM SBCT. Centrally funding repair parts using OMA dollars has its drawbacks when the dollars are siphoned off from the unit's TRM budget. The parts maybe free issue, but the ability to provide adequate support suffers. Since OMA dollars tend to take decrements, the pool of money available to the PM may not meet the required dollars necessary to provide the desired level of support. Diverse funding streams can be problematic because providing coverage for all fielded vehicles whether in garrison or deployed requires different Contract Line Item Numbers (CLINS). CLINs are used to differentiate sections of a contract for management that come from different funding sources. In fact, this is the case with the Stryker CLS strategy. Garrison support of Stryker has suffered in order to support the deployed Stryker. The unit commander's budget is also reduced which limits his ability to maintain the readiness of other weapon systems in the unit because money he could have used to bolster a troubled weapon system has already been removed to provide repair part support that he may not need (Stryker). The money essentially goes to fund other Stryker units.<sup>10</sup>

Unit TRM dollars are diverted by DA from units to PM to allow for payment of the CLS contract. Thus OMA is converted to program funds. The PM was caught in a trick this last year as DA slashed unit TRM dollars; thus effecting the amount provided to the PM who is only increasing the number of supported SBCTs while at the same time realizing a decrease in funding.<sup>11</sup>

### Army Working Capital Fund Challenges

The literature review explained that traditional organic support uses the working capital fund as the funding mechanism for depot maintenance and supply support. The AWCF historically has been used to support long term repair/spare part contracts. “The AWCF is a revolving fund which unique advantages over OMA in that its funds do not expire after one year and it very flexible and can absorb a loss for 1 to 2 years.”<sup>12</sup> Operational commands receive operations and maintenance funding to buy support on a transaction basis from working capital fund activities. The AWCF supports sustainment and is not an appropriated fund, which is why this is a challenge. When the program manager becomes the buyer of support services, funds flow directly to the Life Cycle Command to purchase the necessary sustainment support and not the operational commander. This reduction in budget authority is a great concern to the operational commands because it reduces their funding flexibility. Experts are still unclear how to handle this dilemma in the PBL partnering environment. The AWCF has a distinct budgetary process and these processes do not fit easily within it. Because the AWCF is a revolving fund it must by law maintain a balance between expenditures/revenue, remain cash solvent and capture all of cost of doing business. When a performance based arrangement is constructed it must include all of the cost to the government. This requires a surcharge that captures all of the cost of doing business. Inventory is purchased by Army Materiel Command (AMC) with all costs related to supplying the materiel



recouped by charging the customer a stabilized price which includes overhead costs such as inventory losses, transportation, inventory management and supply operations. Most program and operational commanders do not want to use this funding method, because they feel it increases the cost to their system. But when decisions are made to by-pass, or not use the AWCF, although it might reduce the cost to a particular weapon system, the overall cost to the government remains the same and other systems within the Army have to absorb the cost through a large increase to the surcharge. In other words, the bottom line cost may be a reduced cost for a particular weapons system in a BCT, but the overall funding for the tactical commander remains the same or increases because of the bypass of the AWCF for parts support. Operational Commanders are funded through the TRM model for the surcharge on all spare parts. When repair/spare parts are provided outside of the normal supply channels, the result is that the items left in the operational Command's catalogue of support items are reduced. This places an increased burden on those items to generate the dollars to fund manpower, engineering support, transportation, facilities, and etcetera. It also results in a cost recovery rate (surcharge) increase, which in turn leads to a unit buying power decrease. If enough of the items are supplied outside of the normal channels then those services now funded through the AWCF must be made up by OMA dollars or funded by the PM either through an increase to their staffs, contracting out, or increasing matrix support bills. The end result is that the OMA dollars are further decreased resulting in fewer OMA dollars to the PM to support PBL contracts and a reduction of TRM dollars to unit commanders for support of their weapon systems.

### Expiration of Funds

“Expiration of OMA dollars is a problem.”<sup>13</sup> One-year OMA funds, provided incrementally does not work very well. CLS contracts are financial obligations. They need full funding for liability created at the time of the contract award. Use of OMA has a big impact on contracting strategies. Our one year system causes one year contracting and support strategies. There is often a problem with getting full funding in time to sign the contract. Therefore, there is no incentive for long term investment by the contractor. At times there is a need to receive the required funds for Class IX spares 6 months prior to need.<sup>14</sup> Otherwise, it creates an inability to handle long lead procurements, and surrenders any hopes for reliability improvements and obsolescence management.

### Flexibility Challenges

Is CLS not flexible enough in the Contemporary Operating Environment (COE) or just not on a traditional linear battlefield? There are three main issues under this flexibility question: (1) increased contractor on the battlefield presence, (2) government access to technical and demand data, and (3) stovepipes created in supply and maintenance activities. They are explained as follows.

#### Increased Contractor on the Battlefield Presence

The number of contractors and the scope of their activities clearly have significant impacts on the Army.

There is a heavy reliance on contractors and this could be a liability in operational situations not the same as Iraq. Most CLS in OIF is usually limited to the FOB. In Iraq, the contractors cannot leave the FOB (Forward Operating Base), so there is no on site fixing by them, only by Soldiers.” This drives the need for experience in our own ranks. We are no longer a garrison Army. We are a power

projection Army and sometimes contractors just will not go where we need them.<sup>15</sup>

### Government Access to Technical and Demand Data

A second issue is how the Army should integrate government and contractor information and communication systems. “Log data is critical to the support of any system. Without log data it would be virtually impossible to determine if the contractor was charging the government a fair price for the parts support being provided. In addition to the need for log data to support current operations, log data is essential for future support when the vehicle/weapon system goes out of production. Once the contractor ends production there is no guarantee on how long they will provide parts support or how good that support will be without a warm production base. If at some point the OEM goes out of business or decides that there is not enough profit to continue support, then log data will make it easier to continue support rather than having to try and develop this data from scratch.”<sup>16</sup>

A disconnect between the GDLS DMIS proprietary system and the Army STAMIS to track maintenance, and repair parts has proven to be a major problem. While the Army has a requirement to track and report Strykers as systems (platform, C4ISR, MEP) per the NMC criteria in the -10 manual, the contractors system only focuses on the platform or automotive status. Thus a vehicle “up” for GDLS, and purposes of determining performance of the PBL (>90 percent ORR) could be “down” per the -10 manual for an FBCB2 or LRAS3.

Units and commanders had to rely on numbers provided by the contractor for the automotive status and then hand jam into SAMS to generate a fleet status reflecting system readiness. In many cases, it was too easy just to use the

contractor's numbers even though it was not a correct reflection in the motor pool.<sup>17</sup>

Statistics are a wonderful thing; you can make them say whatever you want. I found specific areas that were manipulated to demonstrate higher readiness numbers. Specifically, the LRAS is a part of the Stryker Vehicle System. When I assumed the vehicles from 3/2 in Iraq, I discovered that they were not counting the vehicle down when the LRAS was dead-lined. When I began reporting them as a system, a very convenient directive came out separating the LRAS from the Stryker as a system. GD and the PM only count the automotive part of the Stryker as part of their readiness reporting; because that is the only part of the system they are responsible for. Raytheon was responsible for the LRAS, CTSF was responsible for the FBCB2, MTS, and etcetera.<sup>18</sup>

Both parties depend on data collected on supported systems for a number of reasons:

The Army wants to understand the operational performance and cost of systems; contractors need data for effective supply chain management and product improvement; both the Army and contractors need to make informed engineering and fleet management decisions; and unit commanders want readiness status and projection data for their operational planning. But there is a natural tension between the contractor controlling data and government doing so, since the data can yield proprietary information as well as shed light on the contractor's true costs.<sup>19</sup>

GD uses DMIS for managing the Stryker ASL. About half way through our year in Iraq, I discovered that they had never done an ASL review on the thing. We were experiencing high usage and zero balances on hubs, yet the stockage level was never adjusted. They were robbing Peter to pay Paul for the last 6 months of our rotation because they knew the Strykers were going to be redeployed to Lewis and they would get a fresh start.<sup>20</sup>

#### Stovepipes in Supply and Maintenance Activities

Under the Stryker contract GDLS controls the entire supply chain with the exception of using the defense transportation system for movement of material. This dependence on contractors has resulted in multiple supply chains delivering material directly to the Brigade. The Army owns, but does not control, Stryker stocks at all levels. Thus, the Army bears the carrying cost and the inventory risk for all Stryker parts. The

government assumes ownership of materiel when delivered to the GDLS parts warehouse in Auburn, Washington. GDLS has the responsibility for setting inventory levels but the Army is subject to the costs. “In addition to having supply chain management, national-level maintenance, and “outside the fence” distribution functions, the contractor has some life-cycle management functions such as directing overhauls and integrating sustainment. The contractor also controls field-level sustainment activities, including deciding what to stock, store and issue; requisitioning items; and performing maintenance.”<sup>21</sup>

The repair parts ship time was phenomenal. The Army's would be for every other system too if we used DHL for every part. When you have PBL that is tied to a contractor they can adjust their expenditures in one area to compensate for shipping requirements in others.<sup>22</sup>

Parts flow was no different than any other system. We used organic Army and Air Force transportation assets to move our parts. It's not like we had our own trucks and airplanes. Same soldiers driving them, same green paint on the outside. The one significant difference is we occasionally used DHL to move something special, fast. The Army could do this, too, but chose not to.<sup>23</sup>



Figure 16. Stryker Supply Shipping Methods

Source: Program Manager SBCT Stryker Sustainment Readiness Review Briefing, Warren, MI, 24 October 2005, Slide 24.

The Army budgeted and bought three ASLs at Auburn, Washington and three ASLs in theater, which were supported by a steady flow of parts from vendors. When a Stryker BCT needed something they didn't have, GDLS pulled it from their production line. GDLS also retrograded all of their repairables to be rebuilt either at the FRA, in Europe by one of their European suppliers, or back in the United States.

We absolutely, positively knew the status and location of every serviceable and unserviceable part and assembly throughout our entire supply system. Even the stuff that is now in the scrap yard at Balad was inventoried and accounted for. Though our zero balance was consistently less than 3 percent, we really didn't care because this metric was such a distant second to ORR. We didn't hesitate to go to zero balance to repair a vehicle, dead-lined or not. When our parts showed up, they came by air, direct to Balad, where they entered the Army transportation network. Every pallet, every container was RF tagged and contained only Stryker parts destined for the Stryker Brigade.<sup>24</sup>

This is in opposition to the Army system where supplies arrive by sea and end up at Arifjan. Each container is RF tagged, so that when it arrives it is known exactly what parts for what systems destined for what units are inside. (See figure 16) But because any given container might hold parts for several different systems in several different units; they must be opened, sorted, and trans-loaded for shipment to a final destination. As soon as that container is opened, all accountability is lost. Two or three workers with forklifts open it up and try to figure out what's going where. This process is time consuming and error prone. This is easier to do when there is a dedicated staff that works nothing but one weapon system. If the Army could afford to intensively manage each vehicle/weapon system in this manner, most systems would enjoy a heightened level of support.

A high ORR was realized in OIF due to focused logistics by the contractor, PM and unit. I like to use the analogy of HOV lanes on the interstate. Stryker parts at first were flying commercial air, later milair; but in all cases have special markings and tags so they are visible at distance. There are also LNOs at the various inter-modal hubs to expedite parts so marked. So Stryker parts travel in the HOV lane. If Army were to put in place the same process for all systems

(Abrams, BFV, HEMTT, etcetera.) it would be like allowing all drivers to use the HOV lane. In addition vehicles were often circle-x status by unit commanders in conditions that would have them NMC-M or NMC-S in home station motor pools.<sup>25</sup>

### Culture Change Challenges

Are there cultural implications that prevent PBL/CLS from being fully implemented with ground combat systems? Yes, the transition to a PBL environment entails a cultural change and requires a level of trust enabling the support provider, government, or contractor, to share in the risk. The task of ensuring weapon system availability, which has traditionally been managed within DOD, is now shared with the commercial environment. PMs and logisticians should align responsibilities and risk to motivate mutually beneficial behavior. This simply suggests that if a contractor (or government entity) is made responsible for an area, it must accept the risks (i.e., cost, performance) associated with that area along with the decision-making authority. Conversely, a contractor that is subject to particular risks from a given area must be given the appropriate decision-making authority (along with a lot more money). For example, if contractors have responsibility for deciding stockage inventory levels, they should be subject to the procurement and holding costs associated with the inventory; this causes them to internalize the tradeoff between the availability of parts and their costs and affords them a larger trade space to trade off inventory vs. product improvements. Establishing the team involves a cultural change.<sup>26</sup> Finding people who are comfortable with sharing information and working outside of the functional stovepipe organizations is difficult. A PBL business relationship entails the effective identification and sharing of risks. PBL, in conjunction with changes in our acquisition policy and contracting policy, requires “Arm in Arm” versus “Arms Length” relationships between DOD and Industry –

this is a significant cultural change. Both must have the same objectives, the same plan to get there, and agreement on how to do it. Failure to do so results in a dysfunction something similar to the depiction in figure 17.



Figure 17. Organizational Culture Change

Source: Defense Acquisition University, PBL road-show presentation, Fort Belvoir, VA, October 2006.

## Part II: Transition to Organic Support Challenges

### Organic Performance Based Logistics

What new challenges are created by transitioning from contractor to organic support? Will the organic strategy still be considered a PBL arrangement? With organic support alone, or even limited contractor support, are there sufficient measurable aspects that can still be defined as PBL? According to OSD and DAU literature, PBL arrangements can be government to government. That is, the PM could delegate responsibility to an organic PSI rather than to a commercial firm, and the PSI can manage



both government and contract providers. For support provided by organic organizations, a performance-based agreement, similar in structure to a Memorandum of Agreement, Memorandum of Understanding, or Service Level Agreement may be used in lieu of a contract to represent and document the terms of the performance based agreement for organic support. One important distinction, however, between Performance-Based Agreements and other types of Agreements and Understandings is that Performance-Based Agreements contain the agreed to performance and/or support metrics that have been identified as meeting the warfighter requirements, and to which the warfighter has agreed to commit funding. The intent of agreements with organic support providers is to formally document the agreed to level of support, and associated funding, required to meet performance requirements. Organic providers, like commercial providers, will have a set of performance metrics that will be monitored, assessed, incentivized, and focused on the target weapon system. The Performance-Based Agreement metrics reflect the highest level of metric(s) that are the most critical in producing the desired performance outcome(s).<sup>27</sup> Contractor accountability can only be maintained if the funds to support that performance outcome are available. The Stryker is a good example where performance outcomes had to be modified to address contract funding constraints.

While OSD policy does in fact specify that PBL can be established with either contractor or organic support, in actual fact the significant majority of PBLs are with contractors, with organic support involved via Public-Private Partnerships.

There are very few “organic” PBLs, and even those are questionable. PBL works because contractors have true accountability at financial risk – failure is not an option. The same level of accountability does not apply to organic providers. In my opinion (shared by many others with PBL expertise), there is no such thing as an Organic PBL. It is almost an oxymoron – one of the reasons PBL works is

due to “real” accountability; failure is not an option; there are tangible financial consequences to failure. None of these conditions exist in an organic support environment. However, to counteract the hue and cry that PBL was just a guise for ‘outsourcing’ support, OSD put in language that PBLs could be contractor or organic. In reality, we have a handful (out of hundreds) of PBLs that are “organic”, and in my opinion they are not true PBLs.<sup>28</sup>

### Training and Maintaining Soldiers

How will the Army’s ability to replace contractors with soldiers be affected by personnel challenges, particularly with respect to the recruitment and retention of additional soldiers? The new Stryker support strategy plans to transition at the rate of two active brigades per year to organic support for all maintenance. TACOM officials admitted that one of the challenges is to ensure the availability of trained Soldiers to replace contractors on a timely basis. The largest hurdle in this regard will be weaning units off the reliance on contractors and becoming more self-sufficient. The plan is phased over 3 years (see figure 18); the additional Soldiers are programmed by HRC and CASCOM. To implement this plan the Army must annually recruit or retain 497 additional soldiers with five specific military specialties, to support all seven Stryker brigades. Additional organic mechanics will eventually reduce the reliance on contractors, but it will take time. The current CLS contract provides training of BSB mechanics as more and more 63Bs are awarded the Stryker ASI. FSRs will remain at the Battalion level and in some EAB capacity and will most likely assist in future training. It has always been intended that BSB mechanics would eventually work on Strykers, the challenge comes in the number of mechanics being less than authorized by the Maintenance Allocation Resource Chart (MARC) because of the austere design and reliance on other CSS enablers is still not realized. “The Army is applying the (MARC)

now that a long standing personnel cap has been lifted from total SBCT end strength. The absence of most enablers, most notably the vehicle prognostics, and fleets of end item replacements, realigned the force design with what is probable, vice possible, given current budget constraints.”<sup>29</sup>

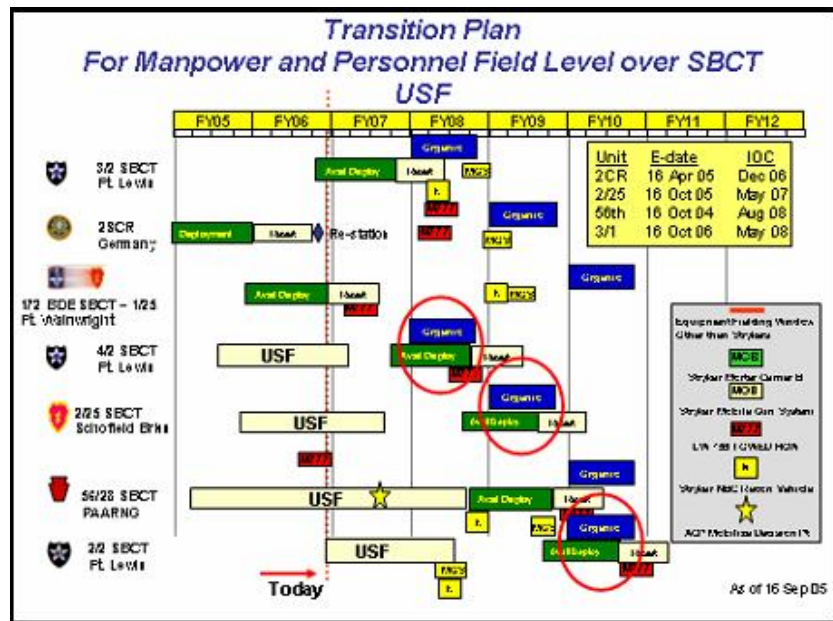


Figure 18. Soldier Transition Plan

Source: PM SBCT Stryker Supply Support Transition IPT Briefing to TACOM ILSC Director. Warren, Michigan, February 2007.

How will the Army sustain soldier skills and knowledge on Stryker vehicle maintenance with only seven BCT’s for these special skilled soldiers to serve in? Soldiers are awarded the ‘R4’ Additional Skill Identifier (ASI) through New Equipment Training Teams (NET) or by attending the Stryker maintenance course at Aberdeen Proving Ground (APG). These soldiers are then tracked by Human Resource Command (HRC) by the ASI. Many SMEs within the Army’s technical maintenance arena maintain that

soldier maintenance of Strykers is not that difficult of a transition. “Automotive basics do not change, just the tools, not such a great leap for most mechanics to work Stryker especially as we have moved away from of- system repair and are now focused on fault isolation and LRU replacement.”<sup>30</sup>

### Transition Effect on the Requirement of Deployment Speed

Will the increased size of the brigade resulting from additional organic personnel still allow the SBCT to meet its 96-hour deployment goal? Just how fast SBCT’s can deploy has been the subject of much debate and analysis (see figure 19). The true answer is with enough transport any Army unit can move faster. In a deployment time analysis conducted by Rand in 2005, two critical assumptions are the amount of airlift available and the working maximum on the ground (working MOG) of airfields. Airlift allocation depends upon national and combatant commander priorities and thus the specific mission in conjunction with the global security situation.

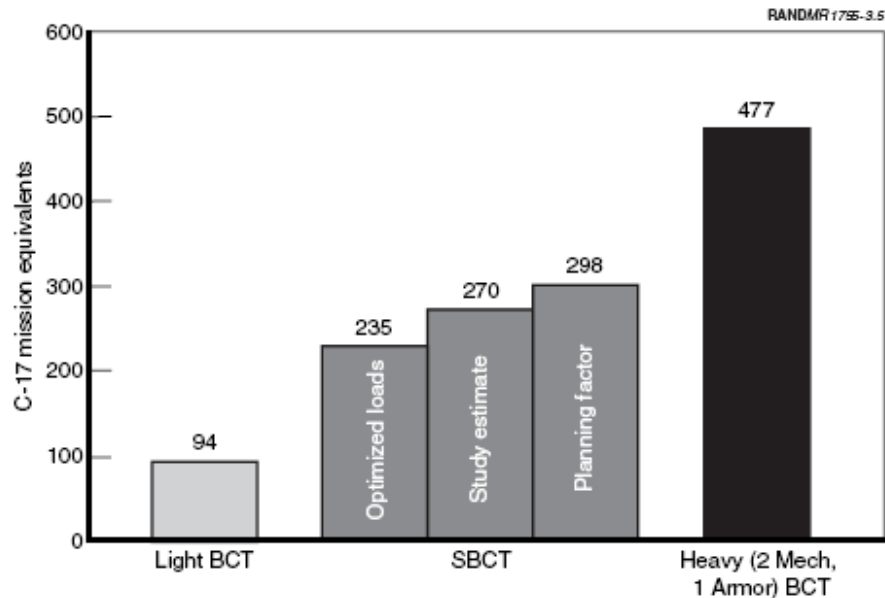


Figure 19. Deployment Speeds among Light, Stryker, and Heavy Brigades  
 Source: Peltz, Eric, *Speed and Power toward an expeditionary Army*, RAND Corporation study, Arlington, VA, 2003

There are two primary elements of the deployment footprint. How much must be moved, and how effectively the aircraft is loaded. An SBCT that is loaded effectively, and with an APOD working MOG of 3, could potentially deploy from Fort Lewis to Skopje in 7.4 days or 45 percent faster than a heavy brigade combat team.. This assumes best-case conditions that do not limit throughput. Achieving this time would require at least 38 percent of the FY05 strategic airlift fleet (maximizing C-17s). This figure includes all vehicles and equipment in a Stryker BCT. If only the Stryker vehicles were moved by air, achieving the four-day deployment time would require 25 percent of the FY 2005 strategic airlift fleet. If a 7.4-day deployment time were acceptable, the airlift allocation requirement would drop from 38 percent to 13 percent.

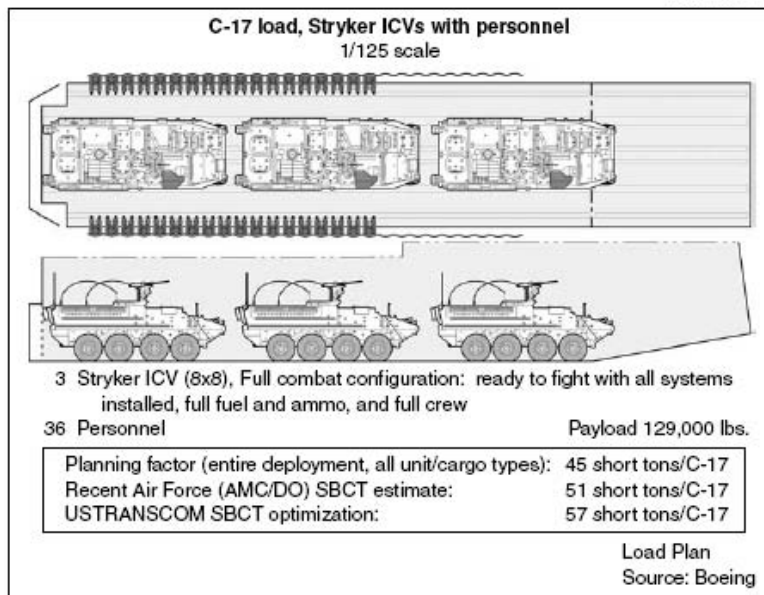


Figure 20. C-17 Load with 3 Strykers, 36 Personnel, and Associated Combat Loads  
*Source:* Briefing by Boeing Corporation of Stryker Loaded in C-17

The addition of 77 soldiers (organic maintainers) to the BCT only results in about a 2 to 3 percent increase of the total SBCT strength. The change in SBCT table of organizational equipment (TOE) personnel strength will go from 3837 to 3916. Based upon C-17 configuration plans (see figure 20, e.g., a load with 3 Strykers, 36 personnel, and their combat loads), and the SBCT Objective TOE, the SBCT requires 270 C-17 equivalent missions to deploy. Adding organic mechanics would increase the number of missions from 270 to 294.

---

<sup>1</sup>GAO Report. *Defense Logistics: “Changes to Stryker Vehicle Maintenance Support Should Identify Strategies for Addressing Implementation Challenge”* (September 2006)

<sup>2</sup>GAO Report. *Defense Logistics: “Changes to Stryker Vehicle Maintenance Support Should Identify Strategies for Addressing Implementation Challenge”* (September 2006)

<sup>3</sup>Electronic mail message to the author from a PEO Stryker Official to the author, Stryker PBL Thesis, Warren Michigan, (13 November 2006)

<sup>4</sup>Electronic mail message to the author from a FT Lewis G3 Official, Stryker and PBL Research, FT Lewis, WA, (12 February 2006)

<sup>5</sup>GAO Report. *Defense Logistics: “Changes to Stryker Vehicle Maintenance Support Should Identify Strategies for Addressing Implementation Challenge”* (September 2006)

<sup>6</sup>GAO Report. *Defense Logistics: “Changes to Stryker Vehicle Maintenance Support Should Identify Strategies for Addressing Implementation Challenge”* (September 2006)

<sup>7</sup>Electronic mail message to the author from an Army G4 official, Stryker and PBL, Pentagon, Washington D.C, (26 December 2006)

<sup>8</sup>Electronic mail message to the author from a DAU PBL official, Stryker, PBL and CLS, Ft Belvoir, VA, (24 November 2006)

<sup>8</sup> Electronic mail message to the author from a DAU PBL official, Stryker, PBL and CLS, Ft Belvior, VA, (24 November 2006)

<sup>9</sup> Electronic mail message to the author from a TACOM official, Stryker, PBL and CLS, Warren MI, (13 October 2006)

<sup>10</sup> Electronic mail message to the author from the Stryker CLS Funding IPT, Stryker, PBL, CLS funding issues, Warren MI, (5 Feb 2007)

<sup>11</sup> Electronic mail message to the author from a FT Lewis I Corps G3 official, Brent Coryell interview with I Corps, FT Lewis WA, (10 October 2006)

<sup>12</sup> Electronic mail message to the author from a TACOM Stryker CLS Funding IPT official, Stryker, PBL, CLS funding issues, Warren MI, (5 Feb 2007)

<sup>13</sup> Electronic mail message to the author from a TACOM Stryker CLS Funding IPT official, Stryker, PBL, CLS funding issues, Warren MI, (5 Feb 2007)

<sup>14</sup> TACOM Presentation, Program Manager SBCT Stryker Sustainment Readiness Review Briefing to ASARC, Warren, MI, (24 Oct 2005)

<sup>15</sup> Electronic mail message to the author from a former Stryker Brigade Support Battalion Commander, Stryker and PBL, U.S Army War College, Carlisle, PA, (11 January 2007)

<sup>16</sup> Unpublished Rand Corporation Study

<sup>17</sup> Electronic mail message to the author from a FT Lewis G3 official, Stryker and PBL, FT Lewis WA, (17 January 2007)

<sup>18</sup> Electronic mail message to the author from a former Stryker Brigade Support Battalion Commander, Stryker and PBL, U.S Army War College, Carysle, PA, (11 January 2007)

<sup>19</sup> Unpublished Rand Corporation Study

<sup>20</sup> Electronic mail message to the author from a former Stryker Brigade Support Battalion Commander, Stryker and PBL, U.S Army War College, Carysle, PA, (11 January 2007)

<sup>21</sup> Unpublished Rand Corporation Study

<sup>22</sup> Electronic mail message to the author from a former Stryker Brigade Support Battalion Commander, Stryker and PBL, U.S Army War College, Carlisle, PA, (11 January 2007)

<sup>23</sup>Electronic mail message to the author from the manager of the Stryker CLS effort for the first Stryker Brigade in Iraq, Stryker and PBL, Pentagon, Washington D.C, 26 December 2006

<sup>24</sup>Electronic mail message to the author from the manager of the Stryker CLS effort for the first Stryker Brigade in Iraq, Stryker and PBL, Pentagon, Washington D.C, (26 December 2006)

<sup>25</sup>Electronic mail message to the author from a FT Lewis G3 official, Stryker and PBL, FT Lewis WA, (17 January 2007)

<sup>26</sup>Extract from U.S. Defense Acquisition University, *Product Support for the 21st Century: A Program Manager's Guide to Buying Performance*. Ft. Belvoir, VA: Defense Acquisition University Press, 2001

<sup>27</sup> Extract from the U.S. Defense Acquisition University, *PBL Student Guide*. Ft. Belvoir, VA: Defense Acquisition University Press, 2004 paragraph 5.3.2.2.

<sup>28</sup>Electronic mail message to the author from a DAU PBL official, Stryker and PBL, Ft Belvior, VA, (26 December 2006)

<sup>29</sup>Electronic mail message to the author from a FT Lewis G3 official, Stryker and PBL, FT Lewis WA, 17 January 2007

<sup>30</sup>Electronic mail message to the author from a Senior Army Maintenance Warrant Officer, Stryker and PBL, Warren MI, 23 November 2006



## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusion 1. The Most Successful Performance Based Logistics Arrangements are Primarily Contractor Logistics Supported

The best PBLs are CLS because contractors can be incentivized and penalized with money. They can be held accountable. Many experts argue that “CLS is not PBL”. The researcher was cautioned on a number of occasions not to confuse the two. Although this can be true, it can also be false. The Army may have started this “CLS is not PBL” campaign so that PBL didn’t become just a buzzword to glorify outsourcing. Even the DAU depicts on their “Spectrum of PBL” chart that complete CLS is one end of the PBL Spectrum (see figure 3 in chapter 2) According to everyone contacted in this research, the Stryker CLS contract was a PBL. It was a PBL because the Army bought operational readiness. Specifically, the Army awarded a contract to General Dynamics Land Systems (GDLS) for a set number of Stryker vehicles, and on the contract if GDLS did not maintain a fleet OR rate of at least 90 percent, they did not get paid. It had all of the characteristics of a PBL with performance metrics written into the contract, and Product Support Integrator (PM Stryker). Perhaps the only characteristic missing was incentives on the initial contract, however they were added later. PBL requires some sort of performance outcome and the metrics to validate those outcomes. Contrast this with the usual arrangements that buy hours of maintenance support at various levels or quantities of parts or both, which usually does not translate into great fleet readiness.

### Conclusion 1 Recommendation

Stop the “CLS is not PBL” campaign. Perhaps a better way to say it is that CLS is not necessarily a PBL, but if a CLS contract is written as a PBL, it is.

### Conclusion 2. The Current Stryker Contractor Logistics Support Contract is a Successful Performance Based Logistics Arrangement

Stryker CLS met all of the benefits that the Army was looking for in a PBL. It was, by many accounts, the first significant system level performance-based logistics success for ground combat systems. The decision to transition from contractor to Soldier support of Stryker is very controversial because of the implications it has on the future of CLS/ PBL support arrangements. The Department of Defense chose PBL as its preferred strategy for weapon system support, put a heavy marketing campaign behind it, and then changed perhaps one of the most successful CLS/PBL sustainment strategies ever established for ground combat systems. The decision appears to be, on face value, a very ironic one. The contractor performed exceptionally well. The Stryker CLS arrangement gave the Army a smaller logistics footprint, which was specifically called for in the Stryker employment strategy. GDLS gave the Army aggregate OR rates in Iraq in excess of 95 percent while driving them over 6.5 million miles. By all accounts, it was a very successful PBL. The support change is like taking candy from a baby. The customer (Stryker units = the baby) had a tasty thing (CLS/GDLS = the candy). The Army took it away for reasons the baby does not understand right now (future cavities, upset stomach = lack of flexibility). The baby is upset now, but will get over it eventually, and be thankful (see figure 20).



Figure 21. Taking Candy from a Baby  
Source: www. Google images, “taking candy from a baby.” \

### Conclusion 2 Recommendation

PBL/CLS should not necessarily be referred to as “the preferred logistics solution” but it should be mandatory to consider PBL/CLS type of support when evaluating the logistics feasibility for products.

### Conclusion 3: The Future of Performance-Based Logistics and Contractor Logistics Support for Ground Combat Systems is Promising

PBL/CLS is a viable strategy that inherently employs industry “best practices” to achieve program cost, schedule and performance improvements. It has the potential to continuously increase weapon system availability and reliability, reduce the logistics footprint and improve sustainment response time. PBL is best implemented within a CLS framework that includes management by the PSI. This is essential for complex systems-of-systems programs such as the Stryker. When effectively implemented, PBL provides a bridge between acquisition and supply chain management within total life cycle systems management.

CLS support for newly fielded combat systems has proven to be successful. CLS worked for Stryker and it will work for other new systems. However, the Army cannot afford to be completely reliant on CLS because it lacks maneuver flexibility. The decision to move to organic support was not based solely on the cost of CLS, as many people believe. The Business Case Analysis proved that the cost was actually very similar to organic support. The decision was based almost completely on the lack of maneuver flexibility created by having contractors on the battlefield. The risks and inflexibility of contractors on the battlefield trump the benefits of high OR rates and a reduced logistics footprint.

CLS for ground combat systems is a viable support strategy for the Army, as long as the Army still maintains an organic capability. Army systems, like Stryker, are in fact more difficult to implement Total System Support contracts, due to Army systems being used very far forward. It is difficult to get support (spares and contractor support personnel) forward into areas of heavy fighting. CLS is a good interim support strategy to enhance the rapid fielding of new combat systems. However full long-term CLS for Ground Combat Systems is not a reality for the same reasons listed above. The reason the Army went to CLS for Stryker was because it was a rapid program development and fielding, not supported by TRADOC (APG) to provide trained mechanics. Additionally, there were many parts and components without NSNs, in the supply system. It was, in effect, the only optimal decision to support the desire to ensure system availability during SBCT standup, and follow on IOTE to support the ASARC decision for full production of Strykers.

Organic PBL is not a reality. To ensure that PBL was not just a guise for outsourcing support, OSD and DAU state that PBLs can be contractor or organic. There is really no such thing as an Organic PBL because there are no tangible financial consequences to failure. Complete CLS works because contractors have true accountability and financial risk – failure is not an option. The same level of accountability does not apply to organic providers.

### Conclusion 3 Recommendation

The future is finding the right mix of contractor and organic support. The Army needs to find some middle ground--a compromise so that the Army can have the best of both worlds. Contractors generally have more flexibility in terms of procurement, handling subcontractors, and use of personnel. Soldiers offer greater flexibility in terms of security, liability, and going anywhere, anytime. The Army should seek a blended Soldier and embedded contractor solution. At a minimum the Army should retain GDLS to assist and augment for unscheduled maintenance, to assist in training soldiers on Stryker maintenance, and to perform scheduled services. The Army should also retain GDLS as Source of Supply and for LRU repairs at national level but obtain common consumables from DLA where warranted.

The Army should take a closer look at PBL arrangements at the subsystem and component level. In the world of ground combat systems, it may be better to write a PBL contract for product support at the subsystem or component level. When doing this, the Army must consider the cost associated with sending repairables back for depot rework. The trade space between PBL metrics (availability/reliability vs. logistics footprint) requires complex logistics analysis given that a system can either spend more on labor

and less on parts, or more on cost effectiveness. The Army must also consider delivery times for parts, both in garrison and during wartime. Spare parts availability is a primary and essential component of a successful sub-system or component PBL program. The order ship time metric is a much better performance measure than stock on hand because of the high cost associated with keeping an inventory.

Conclusion 5. Performance Based Logistics and Contractor Logistics Support Arrangements Require Better Financial Integration and Funds Management

PBL, CLS, and Army financial processes don't mix well. There are many obstacles to overcome with respect to integrating CLS and PBL into the Army financial processes. CLS is a "buy as you go" system. It requires closer management of funds. OPTEMPO dollars direct to the PM requires very tough fund management. Lack of funding flexibility and limited multi-year contracting are additional barriers to the implementation of PBL. The Army needs financial reform to implement PBL/CLS.

Conclusion 5 Recommendation

The Army must decide what the flow of funds is going to be for paying PBL and CLS contracts. Does it go from PMs to contractors or from MACOMs to contractors? To alleviate the expiration of funds problem, the Army needs to determine a way to provide TRM funding the 1st Quarter of every fiscal year, and provide GWOT OMA allocations at least 6 months prior to unit deployment. Better yet, DOD should make the case to congress to use multi-year contracting (three to five years or more) in order to enable the contractor to reduce investment risk, maximize efficiencies, and efficiently manage the obsolescence of parts being issued. The Army should also confirm the OMA TRM numbers in Army Cost Position before the funds are allocated. Finally, the Army must

determine how the funds change from the Army Working Capital Funds (WCF) to Operations and Maintenance Army (OMA) funds. The AWCF does have a distinct budgetary process, that is hard to re-program money, but it is not hopeless.

Conclusion 6. Contractors should not be mandated to use the Army Standard Information Systems

Mandating contractor use of Army STAMIS is not the best solution. The decision to bring the Stryker into the Army STAMIS systems was not the most optimal for both parties. The government and the contractor need to find solutions that allow the sharing of data while protecting both sides' interests. The Army has long established procedures and systems for ordering parts and checking status. Soldier and DA civilians are already quite familiar with these procedures and systems, and, importantly, they feed commanders' readiness tools. At the same time, contractors have long established procedures and systems that are used for their commercial clients. Developing new procedures and systems is likely to be costly and confusing for both parties.

Conclusion 6 Recommendation

PBL support should accept and link existing information and communications systems to minimize the impact on the Army's processes and on providers' business processes. The Army should not force Contractors to conform to Government owned systems. The Army should simply link Government and Contractor Information Systems. It's like using Quicken or Microsoft Money to manage a bank account. Simply hit "update now" and import all of the data needed to update the STAMIS software. Despite issues of open architecture, it is still possible to securely link contractor and government systems through some type of middle-ware system. This solution will maintain the

functionality of the commercial side while providing transparency to the Army, allowing unit readiness managers to determine their status and PMs and logisticians to make informed decisions.

Conclusion 7. The Army Needs an Improved Contractor on the Battlefield Policy

The Contractors on the Battlefield Field Manual does not clearly govern the presence of contractors at different levels. A determination must be made as to what factors should govern the presence of contractors at various levels in the Army. The number of contractors and the scope of their activities clearly have significant impacts on the flexibility of the Army. These range from the ability to free up field maintainers for other duties, to the need to protect contractors on the battlefield, to insurance and cost concerns. Given the scope of these impacts, it is critical that DA policy makers issue clear guidance rather than have PMs and logisticians make inconsistent decisions on their own from program to program. If the contractor decides to leave the battlefield the government must have an alternate plan. If we go from peace to war, the contractor may not be able to get more mechanics, quickly.

Conclusion 8. Culture Change is needed for any Successful Performance-Based Logistics or Contractor Logistics Support Arrangement

There are real cultural and institutional impediments to the implementation of PBL within the Army. Similar reform initiatives involving the institutional Army have met with significant resistance. However, large organizational cultures require long periods of time to affect this sort of dramatic institutional reform. Cultural and organizational barriers must be broken down if the PBL initiative is to be successful.



## Conclusion 8 Recommendation

Under PBL, the team established during acquisition may well last through the life of the weapon system. The PM is in charge of the life cycle but the PM cannot do it alone. PMs must manage their systems in a partnership with other stakeholders in a teaming relationship. Therefore, the first most critical step is to form all of the stakeholders into a PBL team.

## Executive Summary of Conclusions

Stryker was the Army's First Significant System Level Performance-based logistics Success for Ground Combat Systems. Stryker CLS met all of the benefits that the Army was looking for in a PBL support arrangement. Although the Stryker CLS strategy was, by contract, successful, the lack of maneuver flexibility created with Contractors-on-the-Battlefield, out-weigh the PBL benefits. The notion of a complete organic PBL is also not a reality. The Army needs to find a compromise with the right mix between contractors and soldiers so that it can have the best of both worlds.

Despite the overall success of Stryker CLS, there were some challenges with it that the Army can successfully adapt to, and overcome with some effort. Funding integration, culture change, stovepipes in supply and maintenance activities, and government access to technical and demand data are all challenges that can be resolved and applied to other PBL arrangements in the future.

## BIBLIOGRAPHY

- Alderete, Gregory L. "Nonstandard Logistics Sustainment Support in the Stryker Brigade Combat Teams." *Army Logistician* Fort Lee: Vol. 37, Issue. 2, (March/April 2005): 6-8
- Berkowitz, David. "Performance-based logistics--barriers and enablers to effective implementation." *Defense Acquisition Review Journal* 11, no. 3 (December 2004-March 2005): 7-11
- Butler, Dwayne M. "The Logistics Support Team: SBCT Combat Multiplier" *Army Logistician*. Fort Lee: Vol. 37, Issue. 6, (Nov/Dec 2005): 2-6
- Keating, Scott "Managing Risk in the New Supply Chain" *Engineering Management*; Vol. 15 Issue 1, (Feb/March 2005): 24-27
- Kobren, Bill. "Mitigating Diminishing Manufacturing Sources and Material Shortages." *Defense AT and L* 34 no. 3(May/Jun 2005): 62-66.
- O'Reilly, Victor. "Stryker and Reality of War" Written for Congressman Jim Saxton. D21 (Aug 2003):
- Peltz, Eric. *Speed and Power toward an Expeditionary Army*, RAND corporation study, Arlington, VA, 2003
- Taylor, Rick W. "Logistics Risk in the Stryker Brigade Combat Team" *Army Logistician*. Fort Lee: Vol. 36, Issue. 1 (Jan/Feb 2004): 32-37
- Thompson, Dennis M "Frontline Support of the First SBCT at War" *Army Logistician*. Fort Lee: Vol. 36, Issue. 4, (Jul/Aug 2004):12-17
- Turabian, Kate L. *A Manual for Writers of Term Papers, Theses and Dissertations*. 6th ed. Revised by John Grossman and Alice Bennett. Chicago: The University of Chicago Press, 1996.
- University of Alabama, Huntsville *Performance Based Logistics. Study by the Center for the Management of Science & Technology* (21 January 2004):
- U.S. Defense Acquisition University, *Product Support for the 21st Century: A Program Manager's Guide to Buying Performance*. Ft. Belvoir, VA: Defense Acquisition University Press, 2001
- U.S. Defense Acquisition University, *U. S. Army Implementation Guide Performance-Based Logistics*. Ft. Belvoir, VA: Defense Acquisition University Press, 2005

- U.S. Defense Acquisition University, *PBL Student Guide*. Ft. Belvoir, VA: Defense Acquisition University Press, 2004
- U.S. Defense Acquisition University, *Defense Acquisition Guidebook*. Ft. Belvoir, VA: Defense Acquisition University Press, 2004
- U.S. Defense Acquisition University, *DoD Guidebook, Performance-Based Services Acquisition (PBSA)*, Ft. Belvoir, VA: Defense Acquisition University Press, 2000
- U.S. Department of the Army, Army Regulation 700-127, Integrated Logistics Support, Washington, D.C.: U.S. Department of the Army (19 January 2006): 1.6
- U.S. Department of the Army, FM 3-21.31 SBCT, Washington, D.C.: U.S. Department of the Army (March 2003)
- U.S. Department of Defense, DOD Directive 5000.2, *Operation of the Defense Acquisition System*. Washington D.C.: U.S. Government Printing Office (May 2003)
- U.S. Department of Defense, *The Quadrennial Defense Review*, Washington, D.C. U.S. Government Printing Office (September 2001):
- U.S. Department of Defense, Office of the Inspector General (DoDIG). “The Military Departments’ Implementation of Performance-Based Logistics in Support of Weapon Systems” D-2004-110 Washington, D.C.: U.S. Government Printing Office. (August 2004).
- U.S. Government Accountability Office. “Defense Management, DOD Needs to Demonstrate That Performance-Based Logistics Contracts Are Achieving Expected Benefits” (GAO-05-966). Washington, D.C.: U.S. Government Printing Office. (September 2005):
- U.S. Government Accountability Office, “Opportunities to Enhance the Implementation Of Performance-Based Logistics” GAO-04-715, Washington, D.C., U.S. Government Printing Office. (August 2004)
- U.S. Office of Federal Procurement Policy, *A Guide to Best Practices for Performance-Based Service Contracting* (Dec 2000)

## INITIAL DISTRIBUTION LIST

Combined Arms Research Library  
U.S. Army Command and General Staff College  
250 Gibbon Ave.  
Fort Leavenworth, KS 66027-2314

Defense Technical Information Center/OCA  
825 John J. Kingman Rd., Suite 944  
Fort Belvoir, VA 22060-6218

Ralph Doughty  
Transformation Chair  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

LTC Roger Linder  
DLRO  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

LTC James Henderson  
DLRO  
USACGSC  
1 Reynolds Ave.  
Fort Leavenworth, KS 66027-1352

Mr Jack Dugan  
Deputy Commander TACOM LCMC  
6501 East 11 Mile Road  
Warren, MI, 48397

Mr. Kevin Fahey  
PEO Ground Combat Systems  
6501 East 11 Mile Road  
Warren, MI, 48397

CERTIFICATION FOR MMAS DISTRIBUTION STATEMENT

- 1. Certification Date: 16 June 2006
- 2. Thesis Author: Brent D. Coryell
- 3. Thesis Title: PBL, CLS, and Stryker
- 4. Thesis Committee Members:

Dr. Ralph Doughty \_\_\_\_\_  
 LTC Roger Linder \_\_\_\_\_  
 LTC (R) Jim Henderson \_\_\_\_\_

5. Distribution Statement: See distribution statements A-X on reverse, then circle appropriate distribution statement letter code below:

A B C D E F X      Approved for public release; distribution is unlimited.

If your thesis does not fit into any of the above categories or is classified, you must coordinate with the classified section at CARL.

6. Justification: Justification is required for any distribution other than described in Distribution Statement A. All or part of a thesis may justify distribution limitation. See limitation justification statements 1-10 on reverse, then list, below, the statement(s) that applies (apply) to your thesis and corresponding chapters/sections and pages. Follow sample format shown below:

EXAMPLE

<u>Limitation Justification Statement</u>	<u>/</u>	<u>Chapter/Section</u>	<u>/</u>	<u>Page(s)</u>
Direct Military Support (10)	/	Chapter 3	/	12
Critical Technology (3)	/	Section 4	/	31
Administrative Operational Use (7)	/	Chapter 2	/	13-32

Fill in limitation justification for your thesis below:

<u>Limitation Justification Statement</u>	<u>/</u>	<u>Chapter/Section</u>	<u>/</u>	<u>Page(s)</u>
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____
_____	/	_____	/	_____

7. MMAS Thesis Author's Signature: \_\_\_\_\_

STATEMENT A: Approved for public release; distribution is unlimited. (Documents with this statement may be made available or sold to the general public and foreign nationals).

STATEMENT B: Distribution authorized to U.S. Government agencies only (insert reason and date ON REVERSE OF THIS FORM). Currently used reasons for imposing this statement include the following:

1. Foreign Government Information. Protection of foreign information.
2. Proprietary Information. Protection of proprietary information not owned by the U.S. Government.
3. Critical Technology. Protection and control of critical technology including technical data with potential military application.
4. Test and Evaluation. Protection of test and evaluation of commercial production or military hardware.
5. Contractor Performance Evaluation. Protection of information involving contractor performance evaluation.
6. Premature Dissemination. Protection of information involving systems or hardware from premature dissemination.
7. Administrative/Operational Use. Protection of information restricted to official use or for administrative or operational purposes.
8. Software Documentation. Protection of software documentation - release only in accordance with the provisions of DoD Instruction 7930.2.
9. Specific Authority. Protection of information required by a specific authority.
10. Direct Military Support. To protect export-controlled technical data of such military significance that release for purposes other than direct support of DoD-approved activities may jeopardize a U.S. military advantage.

STATEMENT C: Distribution authorized to U.S. Government agencies and their contractors: (REASON AND DATE). Currently most used reasons are 1, 3, 7, 8, and 9 above.

STATEMENT D: Distribution authorized to DoD and U.S. DoD contractors only; (REASON AND DATE). Currently most reasons are 1, 3, 7, 8, and 9 above.

STATEMENT E: Distribution authorized to DoD only; (REASON AND DATE). Currently most used reasons are 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.

STATEMENT F: Further dissemination only as directed by (controlling DoD office and date), or higher DoD authority. Used when the DoD originator determines that information is subject to special dissemination limitation specified by paragraph 4-505, DoD 5200.1-R.

STATEMENT X: Distribution authorized to U.S. Government agencies and private individuals of enterprises eligible to obtain export-controlled technical data in accordance with DoD Directive 5230.25; (date). Controlling DoD office is (insert).