



PARDEE RAND GRADUATE SCHOOL

CHILDREN AND FAMILIES
EDUCATION AND THE ARTS
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INFRASTRUCTURE AND
TRANSPORTATION
INTERNATIONAL AFFAIRS
LAW AND BUSINESS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
TERRORISM AND
HOMELAND SECURITY

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from www.rand.org as a public service of the RAND Corporation.

Skip all front matter: [Jump to Page 1](#) ▼

Support RAND

[Browse Reports & Bookstore](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore the [Pardee RAND Graduate School](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND electronic documents to a non-RAND website is prohibited. RAND electronic documents are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

Report Documentation Page		Form Approved OMB No. 0704-0188
Public reporting burden for the 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 the 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 Washington Headquarters Services, Directorate for Information Operations and Reports, 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 a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.		
1. REPORT DATE 2011	2. REPORT TYPE	3. DATES COVERED 00-00-2011 to 00-00-2011
4. TITLE AND SUBTITLE Paying for War: Funding U.S. Military Operations Since 2001		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER	
	5e. TASK NUMBER	
	5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Rand Corporation,1776 Main Street, PO Box 2138,Santa Monica,CA,90407-2138		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited		
13. SUPPLEMENTARY NOTES		

14. ABSTRACT

From 2001 through 2011, the United States allocated about \$1.2 trillion to the Department of Defense to conduct worldwide military operations that primarily focused on Afghanistan and Iraq. The funding for previous prolonged military operations in Korea and Vietnam was incorporated into the base budget within a few years; however, the U.S. government has continued to use separate budgetary titles to allocate resources for operations since 2001. Through 2009, emergency supplemental appropriations provided most of the funding for operations while a separate title in the annual appropriations bill was used to allocate most of the wartime funding since then. This dissertation analyzes the outcomes from using separate budgets for military operations. The dissertation begins with an examination of the period when emergency supplemental appropriations were the primary instrument used for allocating funding to military operations. I found that the continued use of supplemental appropriations weakens the normal checks between executive and legislative participants in the budgetary process. Furthermore, wartime supplemental appropriations were used to introduce defense policy changes, became a mechanism for augmenting annual defense budgets, and provided a convenient way to pass additional legislation that was often unrelated to operations and politically contentious. The next part of the dissertation examines how recent wartime budgets influence different portions of the annual defense budget. Changes made to personnel policy in wartime budgets introduced large costs into the annual defense program. Additionally, the migration of some costs from the base into wartime budgets along with the introduction of some programs in wartime budgets will likely lead to additional claims on the base budget as operations end. Finally, the Department of Defense must determine how to manage stocks of new and often non-standard equipment acquired during operations. The dissertation details the results of an analysis into how the Army may manage its fleet of Mine Resistant Ambush Protected vehicles as operations in Afghanistan and Iraq conclude, recommending that the Army retain a large number of these vehicles while using its rotational readiness cycle to equip units for their expected operational tasks. Finally, the dissertation addresses how the U.S. should fund military operations in the future by examining how alternative wartime budgetary policies may perform during extended military operations. Many of the budgetary complications that resulted from recent wartime budgetary policy could be ameliorated through developing operational funding criteria early in an operation along with requesting funding at the same time as the base budget.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:

a. REPORT
unclassified

b. ABSTRACT
unclassified

c. THIS PAGE
unclassified

17. LIMITATION OF
ABSTRACT

**Same as
Report (SAR)**

18. NUMBER
OF PAGES

213

19a. NAME OF
RESPONSIBLE PERSON

This product is part of the Pardee RAND Graduate School (PRGS) dissertation series. PRGS dissertations are produced by graduate fellows of the Pardee RAND Graduate School, the world's leading producer of Ph.D.'s in policy analysis. The dissertation has been supervised, reviewed, and approved by the graduate fellow's faculty committee.



DISSERTATION

Paying for War

Funding U.S. Military Operations Since 2001

Aaron L. Martin

This document was submitted as a dissertation in August 2011 in partial fulfillment of the requirements of the doctoral degree in public policy analysis at the Pardee RAND Graduate School. The faculty committee that supervised and approved the dissertation consisted of Ellen Pint (Chair), Jim Quinlivan, and Cindy Williams.



PARDEE RAND GRADUATE SCHOOL

The Pardee RAND Graduate School dissertation series reproduces dissertations that have been approved by the student's dissertation committee.

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2011 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
RAND URL: <http://www.rand.org>
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

PREFACE

The challenge of budgeting for military operations was not a new one that the U.S. faced in the early 2000s. Since World War II, the U.S. has conducted major multiyear military operations in Korea and Vietnam. Yet the methods used to budget for operations since 2001 were very different than during these previous operations. In prior operations, the wartime budgets were largely merged or subsumed within the annual defense budgets within two or three years. However, an alternate wartime budget, either in the form of supplemental appropriations or a separate title in the annual appropriations bill, has been used throughout recent operations in Iraq and Afghanistan.

This dissertation documents the findings and recommendations from an analysis of the outcomes from using separate wartime budgets during prolonged operations. The outcomes explored within the dissertation range from the changes in budgetary influence that the executive and legislative branches have in certain situations to identifying budgetary challenges that will likely emerge as operations conclude. This dissertation should be of interest to those involved with or interested in the federal and defense budgeting process and others interested in the military services' planning and force development.

CONTENTS

Preface.....	iii
Figures.....	vii
Tables.....	ix
Abstract.....	xi
Acknowledgments.....	xiii
Acronyms and Abbreviations.....	xv
1. Introduction.....	1
Three Phases in Recent Wartime Budgets.....	2
Dissertation Structure.....	8
2. Predicting Outcomes of Wartime Supplemental Appropriations.....	10
Budget Theory and Interactions.....	10
A Model of Wartime Supplemental Appropriations.....	18
Predicted Outcomes from the Theoretical Model.....	23
3. Analysis of Wartime Supplemental Requests and Appropriations.....	26
DOD Requests Include Items Normally Found in the Base Budget....	27
Military Personnel.....	30
Operation and Maintenance.....	35
Investments.....	39
Supplementals Were Used to Pass Additional Legislation.....	43
Conclusions.....	47
4. How Supplemental Appropriations Impacted Base Personnel Policy....	49
Expansion of the Army and Marine Corps.....	49
Incremental Deployment Pays and Allowances.....	53
Life Insurance, Death Gratuities, and Traumatic Injury Coverage	57
Conclusions.....	60
5. Wartime Budgets Influence Operation and Maintenance Spending.....	63
TRICARE Reserve Select.....	63
Resource Migrations.....	67
Conclusions.....	76
6. Wartime Acquisition Impacts Force Structures and Operating Costs...	80
Vehicle Armoring.....	80
Tactical Radios.....	92
Conclusions.....	96
7. Army MRAP Retention.....	98
Identifying Potential Roles for MRAPs.....	99
MRAPs in Future Army Fleets.....	107
Recent Army Plans for MRAP Retention.....	119
Comparing MRAP Retention Options.....	121
Retaining MRAPs for the Future.....	124
8. Buying Military Intervention in the Future.....	127

Budgetary Challenges Emerging during Recent Military Operations	127
Budgeting for Future Protracted Operations.....	140
Other Policy Options To Influence Wartime Budgeting.....	145
Conclusions.....	149
A. Wartime Requests and Appropriations.....	153
B. Interviews.....	163
C. Comparing Current and Future TWVs to MRAPs.....	165
D. Allocating MRAPs.....	171
MRAP Allocation during Operations.....	172
E. Modeling the Costs of MRAP Allocation.....	175
Bibliography.....	180

FIGURES

1.1. DOD Wartime Appropriations	4
2.1. Frequency and Size of Supplemental Appropriations Since 1970	16
3.1. DOD Procurement Requests from 2004 through 2009	41
3.2. Congressional Additions to Supplemental Appropriations	44
4.1. Army and Marine Corps End Strength	52
4.2. Monthly Rates for IDP and FSA since 1970	56
5.1. Army and MC Annual Depot Maintenance Requests	70
5.2. Costs of Prepositioned Equipment	74
6.1. Up-Armored HMMWV Requirements, Production Output, and Redistribution from August 2003 through September 2004	81
6.2. Army Light Tactical Wheeled Vehicle Fleet Through 2014	83
7.1. MRAP Retention Options	108
7.2. Capacity for Equipping Deployed BCTs with MRAPs Based on the Number of MRAPs in an Individual BCT's MTOE	113
7.3. Alternative Equipment Sets for an Army Brigade	116
7.4. Fleet Management Techniques	118
A.1. Wartime Requests by Military Service	155
A.2. Wartime Appropriations by Military Service	156
A.3. Army Wartime Requests	157
A.4. Army Wartime Appropriations	158
A.5. Navy and Marine Corps Wartime Requests	159
A.6. Navy and Marine Corps Wartime Appropriations	160
A.7. Air Force Wartime Requests	161
A.8. Air Force Wartime Appropriations	162

TABLES

2.1. Average Proportions of Budgets and Deployments from 2004 to 2009	12
3.1. Difference between Military Personnel Requests and Appropriations	31
3.2. Congressional Provisions Added To Support Military Service Members	33
3.3. Difference between O&M Requests and Appropriations.....	36
3.4. Difference between O&M Requests and Appropriations, Less Defense Health	37
3.5. Difference between Investment Requests and Appropriations.....	39
3.6. Difference Between Investment Requests and Appropriations by Service	42
4.1. Requested Active Duty End Strength by Appropriations Source.....	50
4.2. Annual Costs of Increases in IDP and FSA.....	55
5.1. TRICARE Reserve Select Annual Enrollment.....	66
5.2. Annual and Wartime Maintenance Requests.....	71
5.3. Future O&M Costs by Service.....	76
6.1. MRAPs Variants.....	85
6.2. MRAP Program Funding 2006 Through 2011.....	87
6.3. Estimated MRAP Fleet by Service.....	90
7.1. Army MRAP Models.....	100
7.2. MRAP Performance Characteristics.....	101
7.3. Deployment Demands Driving Fleet Management.....	119
7.4. Comparison of MRAP Retention Options.....	122
7.5. Assessment of MRAP Retention Options.....	123
8.1. Nordhaus Iraq War Cost Estimates.....	130
8.2. Supplemental Impacts on Federal Deficit.....	132
8.3. Policy Changes Introduced in Supplemental Appropriations Bills..	135
8.4. Budgeting Option Summary.....	144
8.5. Requests and Appropriations to the OCOTF.....	146
A.1. DOD Annual Wartime Supplemental Appropriations.....	154
C.1. UAH Performance Characteristics.....	166
C.2. FMTV Performance Characteristics.....	167
C.3. Oshkosh and Navistar MRAP Performance Characteristics.....	168

C.4. Other MRAP Performance Characteristics.....	169
C.5. Expected JLTV Performance Characteristics.....	170
D.1. IBCT Personnel and TWVs.....	171
D.2. HBCT Personnel and TWVs.....	171
D.3. Combat Arms Battalion Low Estimate for MRAP Allocation.....	173
D.4. Estimated MRAP Allocation for BCTs.....	174
D.5. Estimated MRAP Allocation for BCTs and Supporting Organizations	174
E.1. Average Annual Vehicle Usage for Training.....	176
E.2. Training and Contingency Maintenance Cost Differences.....	176
E.3. Costs of Storing Wheeled Vehicles.....	177
E.4. Cost Model Parameters.....	177
E.5. Estimated Annual O&M Costs of MRAP Retention Options.....	178

ABSTRACT

From 2001 through 2011, the United States allocated about \$1.2 trillion to the Department of Defense to conduct worldwide military operations that primarily focused on Afghanistan and Iraq. The funding for previous prolonged military operations in Korea and Vietnam was incorporated into the base budget within a few years; however, the U.S. government has continued to use separate budgetary titles to allocate resources for operations since 2001. Through 2009, emergency supplemental appropriations provided most of the funding for operations, while a separate title in the annual appropriations bill was used to allocate most of the wartime funding since then. This dissertation analyzes the outcomes from using separate budgets for military operations.

The dissertation begins with an examination of the period when emergency supplemental appropriations were the primary instrument used for allocating funding to military operations. I found that the continued use of supplemental appropriations weakens the normal checks between executive and legislative participants in the budgetary process. Furthermore, wartime supplemental appropriations were used to introduce defense policy changes, became a mechanism for augmenting annual defense budgets, and provided a convenient way to pass additional legislation that was often unrelated to operations and politically contentious.

The next part of the dissertation examines how recent wartime budgets influence different portions of the annual defense budget. Changes made to personnel policy in wartime budgets introduced large costs into the annual defense program. Additionally, the migration of some costs from the base into wartime budgets along with the introduction of some programs in wartime budgets will likely lead to additional claims on the base budget as operations end. Finally, the Department of Defense must determine how to manage stocks of new and often non-standard equipment acquired during operations. The dissertation details the results of an analysis into how the Army may manage its fleet of Mine Resistant Ambush Protected vehicles as

operations in Afghanistan and Iraq conclude, recommending that the Army retain a large number of these vehicles while using its rotational readiness cycle to equip units for their expected operational tasks.

Finally, the dissertation addresses how the U.S. should fund military operations in the future by examining how alternative wartime budgetary policies may perform during extended military operations. Many of the budgetary complications that resulted from recent wartime budgetary policy could be ameliorated through developing operational funding criteria early in an operation along with requesting funding at the same time as the base budget.

ACKNOWLEDGMENTS

I would like to begin by thanking my dissertation committee members Ellen Pint (Chair), Jim Quinlivan, and Cindy Williams. I am extremely grateful for their guidance, encouragement, and mentorship throughout this process. I offer thanks to Cindy for her willingness to serve on a dissertation committee for a graduate student across the country, sharing her vast knowledge of the defense budget, and careful review of the dissertation. I thank Jim for beneficial feedback on the results of each of the sections. I also offer thanks to Ellen, who as a project leader offered me early opportunities at RAND and spent countless hours discussing this work and reviewing the results.

The RAND Corporation provided some exceptional mentors during the past four years. I extend a special thanks to Jed Peters who proved to be an exceptional project leader and mentor throughout my time at PRGS. This dissertation greatly benefitted from Jed's thoughtful advice, but I've learned much more about analysis, leadership, and life from Jed. I would like to thank Chris Pernin and Bruce Held for their advice and feedback on the MRAP section and, more importantly, mentorship during my time at PRGS. I would also like to thank Tom McNaugher for taking time to drink coffee and exchange ideas the many times he visited California. I would also like to thank Michael Kennedy from Project Air Force and Jim Hosek from the National Defense Research Institute for financial support for this effort. This support allowed me to get the dissertation off the ground and focus on completion. Several others at RAND also helped me throughout my time at PRGS and deserve thanks. Thanks to Tim Bonds, Jeff Marquis, Natalie Crawford, Tom Lippiatt, Lou Moore, and Ken Burkman.

I would like to thank the staff and faculty of PRGS, especially Susan Marquis for her feedback on my ideas at the proposal stage and assistance scheduling interviews. I would also like to thank Rachel Swanger, Jeffry Wasserman, Stephanie Stern, Jennifer Prim, Mary Parker, Maggie Clay, and Ira Krinsky. You make PRGS a remarkable and improving institution. I also thank my many colleagues at PRGS. I especially thank

Brian Dille for taking the time to listen to and comment on many of the ideas that went into this dissertation.

I would also like to thank those who were willing to participate in interviews for this dissertation. The information collected during these discussions was invaluable for this work.

Finally, I would like to thank my family for their gracious support during my time at PRGS. I thank my parents, Dave and Cindy Martin, for their ongoing support. I especially thank my wife, Rebecca, for her encouragement and patience throughout the past four years. I wouldn't have started graduate school without your encouragement, and I certainly wouldn't have finished without your ongoing support. I would also like to thank my children, Graham and Clara, who joined us during the process. You all are my source of inspiration.

ACRONYMS AND ABBREVIATIONS

ARFORGEN	Army Force Generation Cycle
APS	Army Prepositioned Stocks
ASV	Armored Security Vehicle
BCT	Brigade Combat Team
BEA	Budget Enforcement Act
BSB	Brigade Support Battalion
BSTB	Brigade Special Troops Battalion
C2	Command and Control
CAB	Combined Arms Battalion
CBO	Congressional Budget Office
CONUS	Continental United States
CSH	Combat Support Hospital
CTC	Combat Training Center
COST	Contingency Operations Support Tool
DERF	Defense Emergency Relief Fund
DOD	Department of Defense
DW	Defense Wide
EOP	Executive Office of the President
FMTV	Family of Medium Tactical Vehicles
FSA	Family Separation Allowance
GAO	General Accounting Office / Government Accountability Office
HBCT	Heavy Brigade Combat Team
HDP	Hardship Duty Pay
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HMS	Handheld, Manpack, and Small Form Fit
IBCT	Infantry Brigade Combat Team
IDP	Imminent Danger Pay
IED	Improvised Explosive Device
IFF	Iraq Freedom Fund

ISR	Intelligence, Surveillance, and Reconnaissance
IW	Irregular Warfare
JEM	JTRS Enhanced MBITR
JLTV	Joint Light Tactical Vehicle
JTRS	Joint Tactical Radio System
LMTV	Light Medium Tactical Vehicle
LOGCAP	Logistics Civil Augmentation Program
M-ATV	MRAP All Terrain Vehicle
MBITR	Multiband Inter/Intra Team Radios
MC	Marine Corps
Mil Con	Military Construction
Mil Pers	Military Personnel
MRAP	Mine Resistant Ambush Protected Vehicle
MTOE	Modified Table of Organization and Equipment
MTV	Medium Tactical Vehicle
NDAA	National Defense Authorization Act
O&M	Operation and Maintenance
O&S	Operation and Support
OCO	Overseas Contingency Operations
OCOTF	Overseas Contingency Operations Transfer Fund
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OSD	Office of the Secretary of Defense
QDR	Quadrennial Defense Review
RDT&E	Research, Development, Testing, and Evaluation
RSTA	Reconnaissance, Surveillance, and Target Acquisition
SAG	Sub-activity Group
SCA	Software Communications Architecture
SGLI	Service Members Group Life Insurance

SINGARS	Single Channel Ground and Airborne Radio System
SRW	Soldier Radio Waveform
TOW	Tube - launched, Optically tracked, Wire - guided Missile
TRS	TRICARE Reserve Select
TWV	Tactical Wheeled Vehicle
UAH	Up-armored HMMWV
W&TCV	Weapons and Tracked Combat Vehicles

1. INTRODUCTION

The U.S. Department of Defense (DOD) develops its annual budget following a detailed process that aims to translate national strategy into the military capabilities required to execute that strategy, but one of the unique characteristics of the annual DOD budget is that it does not allocate large amounts of funding for conducting military operations.¹ Thus, the DOD typically requires additional resources to initiate operations. From 2001 to 2011, Congress appropriated about \$1.2 trillion to the DOD for worldwide military operations and activities responding to the terrorist attacks on September 11, 2001.² These resources allowed the military services to deploy and operate around the world, procure new equipment and upgrade existing systems for the unique challenges found in different theaters, and develop indigenous security forces in Iraq and Afghanistan.

Unlike other prolonged conflicts in the past, the U.S. government continued to use budgetary titles outside of the base budget to provide the DOD with the resources to conduct recent overseas operations. From 2001 through 2009, Congress appropriated most of the resources for ongoing military operations in emergency supplemental appropriations bills, which are typically used when a department cannot cover its operating costs during a given year due to unforeseen circumstances. Supplemental appropriations have never been used to such a large degree and for such an extensive period to pay for military operations; funding for previous long operations migrated to the base budget "as soon as even a limited and partial projection of costs could be made."³ Since

¹ Wildavsky, Aaron and Naomi Caiden, *The New Politics of the Budgetary Process*, Fifth Edition, New York: Pearson/Longman, 2004.

² Unless otherwise stated, all years in this dissertation refer to the federal government's fiscal year, which runs from October through September.

³ Daggett, Stephen, *Military Operations: Precedents for Funding Contingency Operations in Regular or in Supplemental Appropriations Bills*, CRS Report RS22455, Washington, DC: Congressional Research Service, June 13, 2006.

2010, the DOD requested and received most wartime funding under a separate budgetary title in the annual defense appropriations bills while submitting its wartime funding request along with the annual budget request.

The purpose of this dissertation is to determine how recent wartime budgetary policy affected ongoing operations, influenced overall defense expenditures and force structures, and served as a vehicle for introducing policy changes. Further, this dissertation assesses alternative budgetary policy options for funding future military operations. This chapter begins with a discussion of the evolution of recent wartime budgets then outlines the remainder of the dissertation.

THREE PHASES IN RECENT WARTIME BUDGETS

While the policy of using a separate wartime budget, provided through supplemental appropriations or an alternate title in the annual appropriations bill, persisted throughout operations since 2001, the scope of wartime budgets evolved over time. During an interview, Mark Cancian, who was involved in developing the budgets, observed that there were three distinct phases in recent wartime budgets.⁴ The first phase took place from 2001 through around 2004 with the administration requesting small supplemental appropriations with a narrow operational scope. The second phase lasted from 2005 through the first part of 2009 and was characterized by an increase in the size and scope of the supplementals. The third phase began in 2009 and is marked by a shift to using a separate title in the annual appropriations bill with constraints on the types of items the DOD may request in a wartime budget. This section uses Cancian's framework to describe the wartime budgetary policy during each of the three phases.

There have been two primary mechanisms used to appropriate money to the DOD for military operations during this time. Emergency supplemental appropriations are requested and allocated after the start of the fiscal year, while Title IX is a budgetary title in the annual defense

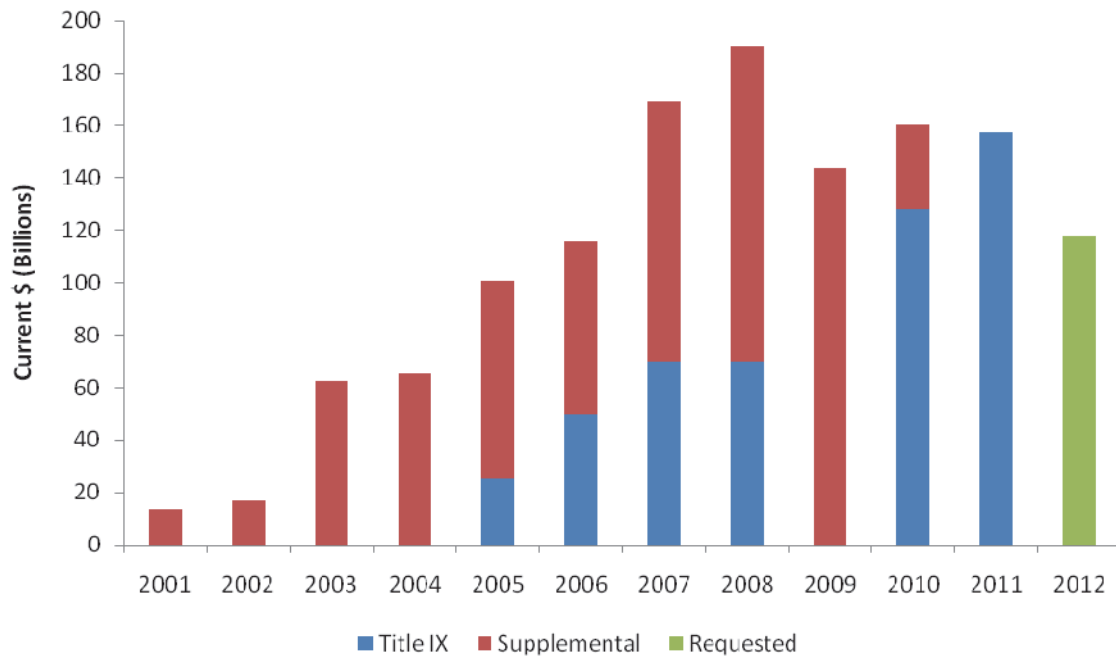
⁴ Conversation with Mark Cancian, December 17, 2010.

appropriations bill that Congress has used to allocate additional funding for military operations. From 2005 through 2008, Congress provided Title IX appropriations in response to supplemental appropriations requests or to allow the DOD to conduct operations until a supplemental request was submitted. This practice began at the end of 2004 when Congress responded to a request for 2005 supplemental appropriations amounting to \$25 billion by allocating wartime resources under Title IX of the annual defense appropriations bill. Congress continued to appropriate resources under Title IX from 2005 through 2008 to allow the services to conduct operations until wartime supplemental appropriations for the full year could be requested and appropriated.⁵ These were often called bridge appropriations. While Title IX appropriations during these years do not meet the explicit criteria for supplemental appropriations since they were passed as part of the annual appropriations bill, they functioned more like supplemental rather than annual appropriations. Title IX appropriations from 2004 through 2008 either resulted from an official request for supplemental appropriations or were not requested prior to enactment. Therefore, appropriations in Title IX through 2008 are treated as supplemental throughout this dissertation. Since 2010, Congress has appropriated wartime funding under Title IX that the administration requested at the same time as the president's annual budget submission.

Figure 1.1 depicts the amounts Congress appropriated to the DOD for military operations from 2001 through 2011 along with the amount requested for operations in 2012. Wartime funding grew from 2002 through 2008, leveled off at a reduced level from 2009 through 2011 and is expected to decline again in 2012, mostly due to the anticipated end of operations in Iraq in December 2011.

⁵ Belasco, Amy, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11*, CRS Report RL33110, Washington DC: Congressional Research Service, September 2, 2010, 45.

Figure 1.1
DOD Wartime Appropriations



Sources: Supplemental Appropriations Bills and Defense Appropriations Bills

Early Supplemental Appropriations: 2001 - 2004

Supplemental appropriations are necessary in the early stages of a major military operation since the annual budget does not include provisions for fighting wars. Hence, the DOD requested supplemental appropriations from 2001 through 2004 to initiate Operation Enduring Freedom (OEF) in Afghanistan, enhance homeland security, and then to begin Operation Iraqi Freedom (OIF). The wartime supplemental appropriations bills passed from 2001 through 2004 focused primarily on operational costs. Congress allocated about 94 percent of the DOD's wartime appropriations from 2002 through 2004 to Operation and Support (O&S) titles.⁶

⁶ The O&S titles are Military Personnel and Operation and Maintenance (O&M). Investment titles compose much of the remaining funding and are procurement and research, development, testing, and evaluation (RDT&E).

During this time, there was also a high, but decreasing, level of uncertainty regarding the duration and intensity of military operations around the world. This is evident in the supplemental appropriations through the allocation of funding to titles that, while included under O&S, allow for the transfer of funds to other titles. Allocation to these transfer titles made up 83 percent of wartime funding in 2002, 25 percent in 2003, and 5 percent in 2004. Candreva and Jones (2005) highlight that Congress delegated budgetary power during these early phases of the war while a "perception of high uncertainty and significant imminent threat to U.S. national security" existed but began to reassert Congressional budget authority as this uncertainty diminished.⁷

While the supplementals during this time tended to focus narrowly on operational costs, some participants in the budgeting process began to use them as a convenient and reliable instrument to enact defense related policy changes. Congress increased the rates for deployment pay and allowances in the supplemental passed in 2003, and in 2004 attached a provision to the supplemental appropriations bill that introduced new healthcare benefits for some service members in the Reserve Components.⁸ In addition to these changes, the DOD began requesting supplemental appropriations for additional personnel on "active duty above the normal strength levels," a policy designed to temporarily increase end strength in the Army and Marine Corps.⁹

Overall, these early supplemental appropriations bills provided the means to initiate worldwide military operations. They followed the

⁷ Candreva, Philip J. and L.R. Jones, "Congressional Delegation of Spending Power to the Defense Department in the Post-9-11 Period," *Public Budgeting and Finance*, Vol. 25, No. 4, December 2005, 19.

⁸ U.S. Congress, *Making Emergency Wartime Supplemental Appropriations for the Fiscal Year 2003, and for Other Purposes*, P.L. 108-11, Sec. 1316, 2003 and U.S. Congress, *Making Emergency Supplemental Appropriations for Defense and for the Reconstruction of Iraq and Afghanistan for the Fiscal Year Ending September 30, 2004, and for Other Purposes*, P.L. 108-106, Sec. 1115, 2004.

⁹ U.S. Department of Defense, *FY2004 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Noble Eagle*, Washington DC: Department of Defense, September 2003, 11.

precedent set during previous operations where administrations requested and Congress passed supplemental appropriations to fund the early phases of military operations. In this case, the supplementals passed in 2001 and 2002 allowed the DOD to enhance homeland security and begin OEF, while those passed in 2003 and 2004 provided the resources for early operations in Iraq.

Supplemental Appropriations Grow: 2005 - 2008

The size of emergency supplemental appropriations for the DOD began to grow rapidly in 2005, and by 2008 real war funding was twice as much as it had been in 2004. The composition and scope of the supplemental appropriations bills also evolved from 2005 through 2008. From 2002 through 2004, funding for investments made up about 6 percent of wartime funding, but in 2005 the DOD began acquiring more equipment using supplemental appropriations. Funding for investments increased to 22 percent in 2005 and made up 28 percent of total wartime appropriations from 2005 to 2008. The DOD used this funding to purchase additional equipment for deploying units, to replace destroyed equipment, and also began acquiring new capabilities to meet operational needs.

Additionally, the scope of wartime funding during this period grew to include some things normally funded in the annual DOD budget. For example, the Army and Marine Corps requested funding in supplemental appropriations to transform their force structures. The scope of wartime funding again broadened in 2007 after the Deputy Secretary of Defense issued guidance to the services to expand their wartime funding requests. This guidance contributed to the large growth in supplemental appropriations requests in 2007. Further, funding for the program to acquire Mine Resistant Ambush Protected (MRAP) vehicles peaked in 2008 with Congress appropriating \$16.8 billion that year.

Shift to Title IX: Since 2009

Supplemental appropriations for 2009 marked a transition into the last phase of wartime appropriations; to begin with, the requests for

wartime resources were renamed Overseas Contingency Operations (OCO) requests.¹⁰ Much of the funding for 2009 passed as part of the 2008 supplemental appropriations bill. In January 2009, as part of the transition to the new administration, the Office of Management and Budget (OMB), working with the DOD, began developing a set of criteria that clearly defined what could, and could not, be included in war funding requests and that aimed to limit such requests to the incremental costs of fighting the wars. OMB issued the criteria to the DOD in March 2009 and subsequently updated it in September 2010, mainly to clarify elements that had caused confusion or had not been covered in the original guidance.

OMB's guidance required that certain criteria must be met for an item to be included in the OCO request. First, the request must be focused on "geographic areas in which combat or direct combat support operations occur."¹¹ Furthermore, items must meet other criteria to be included in the wartime funding request. For example, replacement of combat losses or "specialized, theater-specific equipment" was allowed, but accelerating replacements already in the Future Years Defense Plan was not.¹² OMB's criteria also specified items that the DOD could not include in its OCO funding requests; the list mentioned things that had been included in earlier supplementals, such as Base Realignment and Closure activities, childcare facilities for service members' families and bonuses for recruiting and retention.¹³

The administration also began submitting its OCO requests with the president's annual budget submission in 2010. Submitting the OCO requests earlier provided additional oversight opportunities within the authorizing committees in Congress and also led to a much greater use of

¹⁰ Throughout this dissertation, I refer to funding for military operations as supplemental if occurring prior to 2010, OCO if occurring since 2010, or simply wartime funding if included in both time periods.

¹¹ Office of Management and Budget, "Criteria for War/Overseas Contingency Operations Funding Requests," Washington, DC: Office of Management and Budget, July 2010.

¹² Ibid.

¹³ Ibid.

Title IX in the annual budget. Beginning in 2010, Title IX funding was intended to cover the entirety of wartime expenses. However, the decision to increase the number of forces in Afghanistan prompted the administration to request supplemental appropriations to cover the expanded costs of its changing war plans. In 2011, operations have been funded entirely through Title IX.

DISSERTATION STRUCTURE

The remainder of this dissertation details an analysis of the budgetary and force structure outcomes resulting from the way the government resourced military operations from 2001 through 2011. The dissertation is organized into seven chapters that explore different aspects of wartime funding.

Chapters Two and Three examine the period from 2002 through 2009 when emergency supplemental appropriations served as the primary means for funding military operations. Chapter Two explores the interactions between the participants in the budgetary process and describes a theoretical model that predicts budgetary outcomes when the supplemental appropriations process is used to provide resources for military operations over a prolonged period of time. Chapter Three explores how budgetary trends during this period followed from the predictions of the model.

Chapters Four through Six cover wartime budgets from 2003 through 2011; these chapters use case studies to examine the enduring effects of recent wartime appropriations. Chapter Four details the implications of several different personnel policy changes enacted through supplemental appropriations. Chapter Five highlights how wartime appropriations may influence the annual Operation and Maintenance (O&M) budget. Chapter Six highlights how the acquisition of equipment during recent operations may impact force structures, annual budgets, and ongoing development programs.

Chapter Seven provides a detailed study of an impending decision the military services face from recent wartime procurement. This chapter examines how the Army should manage the fleet of MRAPs it acquired for operations in Iraq and Afghanistan. The chapter highlights potential

roles MRAPs may fill in the Army's Tactical Wheeled Vehicle (TWV) fleets and recommends a course of action that would allow the Army to better equip units for their expected operational requirements.

Finally, Chapter Eight examines how the U.S. government should budget for protracted military operations in the future. The chapter outlines the major budgetary problems and challenges identified throughout the preceding chapters and describes how alternative budgetary policy options may perform during prolonged military operations in the future. This chapter concludes the dissertation with some policy recommendations directed towards the executive and legislative branches designed to moderate budgetary complications during future military operations.

2. PREDICTING OUTCOMES OF WARTIME SUPPLEMENTAL APPROPRIATIONS

From 2001 to 2009, Congress provided about \$880 billion in emergency supplemental appropriations for the DOD to execute military operations around the world. The supplemental appropriations process used to allocate resources for military operations during this period was very different from the normal appropriations process, potentially generating defense appropriations for activities that were not related to operations along with providing a vehicle for introducing new policy that was often politically contentious and unrelated to wartime efforts.

This chapter begins with a review of the federal budgeting literature focusing first on broad budgeting theory before diving into more specific pieces that examine how interactions among the different branches of government influence budgetary outcomes. Then, it describes the development of a theoretical model used to predict outcomes of the supplemental appropriations process when applied to military operations. It concludes with a summary of predicted outcomes that are examined in the following chapter.

BUDGET THEORY AND INTERACTIONS

Theoretical explanations of the federal budgetary process generally follow one of two approaches. They assert that the allocation of resources evolves incrementally, or that it focuses on meeting strategic goals. These alternative theories serve as a starting place for considering budgetary allocation for recent military operations. However, neither fully describes recent supplemental requests and the resulting appropriations for wartime operations.

Incrementalism asserts that budgetary decisions focus on previous levels of funding with small increases or decreases from one year to the next.¹⁴ Wildavsky argued that the federal government makes decisions incrementally due to the complexity of the federal budget and in order to provide program stability; he also went further, arguing that this is

¹⁴ Wildavsky and Caiden, 46-50.

how the government should make these decisions.¹⁵ According to this theory, appropriations for a given year should vary only incrementally from the previous year.¹⁶ Programs that a department conducts on an ongoing basis make up its "base," which should continue to receive funding without much scrutiny; departments then compete annually for their fair share of the increase or decrease in the overall budget.¹⁷

While Incrementalism may explain the variation in annual appropriations, it does not describe the supplemental appropriations process, which is directed at meeting some unexpected resource need identified during the year of execution. Wartime supplemental appropriations are requested for activities that occur outside the DOD's annual programs; additionally, in the beginning of a military operation, there is not a record of costs to build upon while the overall "uncertainty about war costs may make advance appropriation difficult."¹⁸ Thus, the proportion of the supplemental funding provided to the military services does not reflect their normal shares but is likely more related to their contribution to military operations. Table 2.1 highlights this point by showing the proportions of funding directed to each service in the base request and supplemental appropriations along with the average share of deployed personnel provided by the services.

An alternative theory to Incrementalism, when applied to military operations, states that funding requested and ultimately provided to the DOD follows directly from needs faced by the military services conducting operations around the world. Supplemental requests and justification documents submitted in support of additional funding for military operations provide descriptions of the resources required by the DOD in order to execute the president's plans. Adams and Williams

¹⁵ Kettl, Don F., Foreword, *The New Politics of the Budgetary Process*, by Aaron Wildavsky and Naomi Caiden, Fifth Edition, New York: Pearson/Longman, 2004, xi-xvi.

¹⁶ Schick, Allan, *The Federal Budget: Politics, Policy, Process*, Third Edition, Washington, DC: Brookings Institution Press, 2007, 240.

¹⁷ Wildavsky and Caiden, 46-47.

¹⁸ Ibid., 179-180.

(2010) explain that "administrations defend their national security budget decisions as rational responses to events or the requirements of strategy and policy."¹⁹ While a rational explanation for supplemental appropriations is compelling, some analyses dismiss portions of recent war appropriations as superfluous to military operations. For example, in 2007 the Congressional Budget Office (CBO) concluded that the "annual [wartime] funding needed to replace and repair the Army's helicopters, combat vehicles, and trucks are lower than the Administrations' corresponding funding requests."²⁰ Additionally, Congress often adds unrequested appropriations or policy measures, much of which are entirely unrelated to ongoing operations, to these bills as they move through the legislative process.

Table 2.1
Average Proportions of Budgets and Deployments from 2004 to 2009

	Supplemental	Base	Deployment
Army	54.8%	25.2%	66.1%
Navy / MC	12.6%	29.4%	22.3%
Air Force	12.6%	29.3%	11.4%
Defense Wide	20.0%	16.2%	NA

Sources: Supplemental Appropriations Bills, National Defense Budget Estimates, and DOD Statistical Information Analysis Division: Active Duty Military Personnel Strengths By Regional Areas and By Country

In addition to these general theories of federal budgeting, there is a portion of the literature that focuses on describing how the executive and legislative branches interact during the budgetary process. Kiewiet and McCubbins (1985) concluded that during the normal budgeting process the president and Congress both take an accommodative

¹⁹ Adams, Gordon and Cindy Williams, *Buying National Security: How Much American Plans and Pays for Its Global Role and Safety at Home*, New York: Routledge, 2010, 223.

²⁰ Congressional Budget Office, *Replacing and Repairing Equipment Used in Iraq and Afghanistan: The Army's Reset Program*, Washington, DC: Congressional Budget Office, September 2007, ix, 34-36.

approach in their budgeting interactions. This accommodative approach manifests itself in the president submitting a budget request that is similar in size and content to the one Congress prefers while Congress passes a bill that largely reflects the president's request.²¹ While the president and Congress may acquiesce to each others' preferences, Congress usually passes a budget that is smaller than requested.²²

Kiewiet and McCubbins (1988) also explored the president's veto authority. After Congress passes an appropriations bill, the president has the opportunity to reject it through a veto. The veto power a president holds is limited in that a two thirds majority in Congress may override it. Even though the veto power is not always invoked, even the threat of a veto often allows the president to influence the outcome of a bill. In the normal budgetary process, the veto threat is most effective when the president prefers a smaller budget than does Congress.²³

While useful in describing the types of interactions that occur in the budgetary process, the literature examined above focuses primarily on the annual budgeting process, but supplemental appropriations are passed for different reasons outside this normal process. The purposes for using supplemental appropriations have evolved over time. Prior to the mid-1980s, the federal government used supplemental appropriations for things like financing pay raises for federal employees, funding programs when the authorization process lagged behind appropriations, providing economic stimulus through financing new programs, or covering

²¹ Kiewiet, D. Roderick and Matthew McCubbins, "Appropriations Decisions as a Bilateral Bargaining Game between President and Congress," *Legislative Studies Quarterly*, Vol. 10, No. 2, May 1985, 181-201.

²² Wlezien, Christopher, "The President, Congress, and Appropriations, 1951-1985," *American Politics Research*, Vol. 24, No. 1, January 1996, 81-103.

²³ Kiewiet, D. Roderick and Matthew McCubbins, "Presidential Influence on Congressional Appropriations Decisions," *American Journal of Political Science*, Vol. 32, No. 3, August 1988, 713-736.

shortfalls in existing budgets when departments required additional resources due to unexpected circumstances.²⁴

Wlezien (1993) analyzed supplemental appropriations passed from 1948 through 1985 to identify the factors influencing the total size of supplemental appropriations each year. Wlezien focused on factors that annually influence the level of supplemental appropriations "rather predictably" as opposed to events like natural disasters that lead to supplementals but are "highly unpredictable" from one year to the next.²⁵ He found that the factors associated with defense and non-defense supplemental appropriations were different. Those supplemental appropriations focused on defense primarily related to war or inflation, while supplemental appropriations for nondefense purposes were influenced by economic conditions, transitions to a Democratic president, and "strategic under-appropriations" where Congress deliberately provided less than requested in the regular budget expecting the president to later request supplemental appropriations.²⁶ Furthermore, Wlezien (1996) described the regular and supplemental appropriations process prior to 1985 as a two-stage process in which decisions in the regular process were linked to supplemental appropriations through strategic under-appropriations.²⁷

Congressional action in the mid to late 1980s began to change how Congress employed supplemental appropriations. The Bipartisan Budget Agreements of 1987 and 1989 limited the Congressional use of supplemental appropriations to only things identified as "dire emergencies."²⁸ The Budget Enforcement Act of 1990 (BEA) codified the

²⁴ Congressional Budget Office, *Supplemental Appropriations in the 1970s*, Washington, DC: Congressional Budget Office, July 1981, xiii-xiv; Congressional Budget Office, *Supplemental Appropriations in the 1980s*, Washington, DC: Congressional Budget Office, February 1990, 22-26; and Schick, 2007, 257-259.

²⁵ Wlezien, Christopher, "The Political Economy of Supplemental Appropriations," *Legislative Studies Quarterly*, Vol. 18, No. 1, February 1993, 57.

²⁶ Ibid., 64-70.

²⁷ Wlezien, 1996.

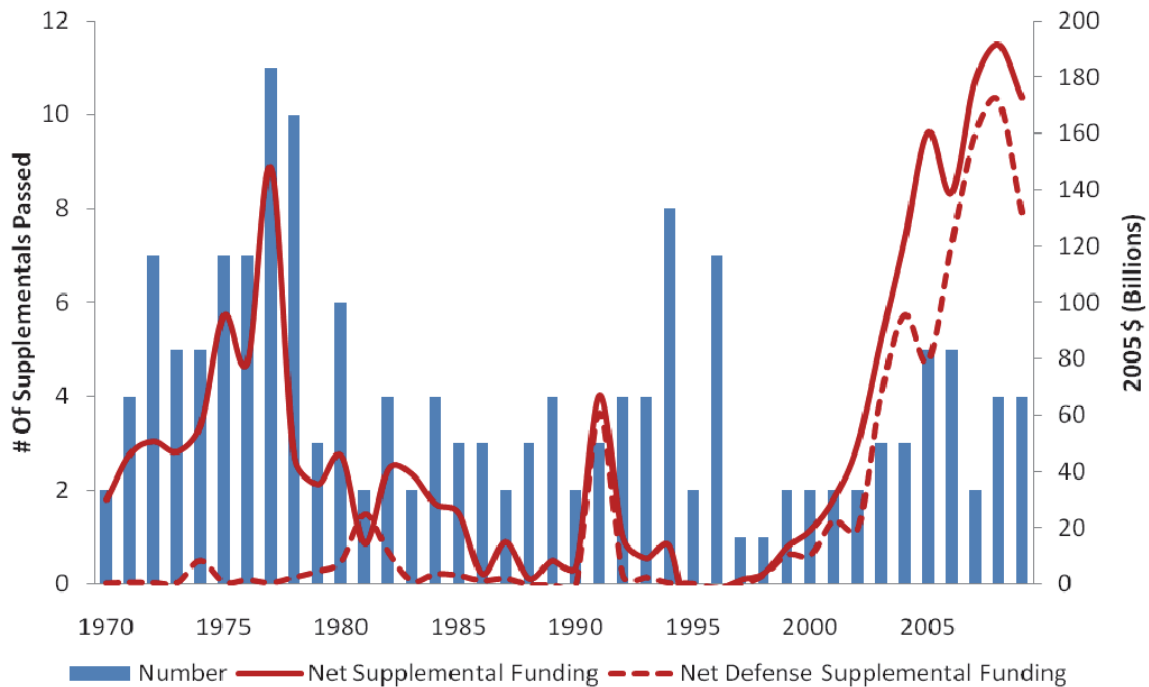
²⁸ Congressional Budget Office, 1990, 35-39.

agreements of 1987 and 1989 establishing limits on discretionary spending as well as a "pay-as-you-go" requirement to ensure that new legislation would be deficit neutral. The BEA also included sequestration to enforce caps on spending.²⁹ The BEA rules were extended twice during the 1990s and were enforced through 2002. These policy changes generally altered the government's use of supplemental appropriations, and since then supplementals typically focus on providing resources in response to disasters or for military operations. In many ways, these changes effectively ended the two stage budgeting process identified by Wlezien. Figure 2.1 highlights how the number of supplemental appropriations bills and the amount of funding provided in them evolved since 1970.

In the 1970s and early 1980s, Congress often passed supplemental appropriations that were fairly large. However, aside from a large supplemental appropriations bill passed for the Gulf War in 1991, the overall size and frequency of supplementals greatly diminished from the mid-1980s through 2001. Then, the amount of funding provided through supplemental appropriations increased rapidly after 2001 as the U.S. initiated worldwide military operations that focused on Afghanistan and then extended those operations to Iraq in 2003. The studies described in this section focused on examining interactions in both the normal budgetary process and supplemental processes through the mid 1980s, but there are several reasons why recent supplementals may present unique types of interactions between the executive and legislative branches, potentially leading to different outcomes.

²⁹ Congressional Budget Office, *Supplemental Appropriations in the 1990s*, Washington, DC: Congressional Budget Office, March 2001, 5-6.

Figure 2.1
Frequency and Size of Supplemental Appropriations Since 1970



Sources and notes: Data collected from CBO Supplemental Appropriations reports covering the 1970s, 1980s, 1990s, and 2000s and *Congressional Quarterly Almanacs* 1970 - 1980. In 1981 and 1995, the defense supplemental total is more than the net supplemental total. This can occur when rescissions in funding for domestic programs reduce the overall level of supplemental appropriations below what was provided for defense.

One factor that distinguishes recent supplemental appropriations is the urgency placed on their passage by both the president and DOD. This occurred largely because the DOD was already executing planned activities for which it was requesting funding and there was no source of backup funding if Congress did not pass supplemental appropriations. During the normal budgetary process, if Congress fails to make appropriations by the beginning of the fiscal year, then it typically passes a continuing resolution allowing agencies to continue to operate. When wartime supplemental appropriations are anticipated but not yet passed, the DOD often uses funds that were allocated through its annual appropriations for the latter parts of the year expecting that it will

receive additional resources later.³⁰ If Congress does not provide the budget authority requested in a timely manner, the DOD may need to limit ongoing activities.³¹

While wartime appropriations are a priority for the president and executive agencies, there is also typically less concern about deficit spending arising out of funds used to pay for emergencies. There is evidence for this in the BEA, which exempted emergency spending from budgetary limits and did not require funding offsets. Furthermore, elected officials may view emergency funding as a way to signal their dedication to certain constituencies.

Another feature that distinguishes supplemental appropriations for military operations or disasters is that the federal agencies executing operations likely have much more influence on the total amount requested than during the normal process. During the construction of the normal defense budget the administration provides guidance on the top line for the budget.³² However, developing guidance for operational spending as it relates to war or disaster relief may not be as feasible or even possible. For example, supplemental requests for the DOD often reflect resources that have already been allocated during operations.³³

Finally, supplemental appropriations bills typically move through the legislative process very quickly. About 86 percent of supplemental appropriations bills pass within four months of request while annual budgets have up to 8 months to be passed before the start of the next fiscal year and many take longer to pass.³⁴ The urgency to pass these bills may reduce Congressional oversight of the items in the requests relative to a standard appropriations bill. The Iraq Study Group noted

³⁰ Jones, L.R. and Jerry McCaffery, *Budgeting, Financial Management, and Acquisition Reform in the U.S. Department of Defense*, Charlotte, North Carolina: Information Age Publishing, 2007, 291-292.

³¹ Gates, Robert, *Defense*, Statement Submitted to the Senate Appropriations Committee-Defense, June 16, 2010. Accessed Oct. 19, 2010 at: <http://appropriations.senate.gov/ht-defense.cfm>.

³² Adams and Williams, 104.

³³ Jones and McCaffery, 292.

³⁴ *Ibid.*, 273-279.

that the supplemental appropriations process leads to "a spending bill that passes Congress with perfunctory review."³⁵

The next section details a theoretical model developed to predict outcomes when funding protracted conflicts using supplemental appropriations.

A MODEL OF WARTIME SUPPLEMENTAL APPROPRIATIONS

The theoretical framework developed below to describe wartime supplemental appropriations focuses on how three different participants interact during the supplemental appropriations process. The Executive Office of the President (EOP) begins the process through initiating operations or not including requests for funding in the annual budget submission. The DOD, representing all of the military services as well as the combatant commanders in this model, develops its request for supplemental wartime funding, and sends it to the OMB, itself a part of the EOP. The OMB formally requests supplemental appropriations from Congress. Congress receives this request and passes a supplemental appropriations bill. The president then has the option to sign or veto the appropriations bill presented to him by Congress. Each participant holds distinct individual interests that influence the decisions made during the process. The development of the theoretical model in this section identifies the likely interests of the president, Congress and the DOD and discusses how the supplemental appropriations process incentivizes each participant to pursue their individual interests in addition to funding military operations.

Due to the complexities of wartime resource requirements, it is necessary to consider both the overall size and the composition of supplemental appropriations. The model predicts outcomes generally and across three major spending categories: military personnel, O&M, and investments, which include procurement as well as research, development, testing, and evaluation (RDT&E) titles.

³⁵ The Iraq Study Group, *The Iraq Study Group Report: The Way Forward - A New Approach*, New York: Vintage Books, 2006, 90-92.

Wartime Supplemental Appropriations Theory

The first active participant in the supplemental appropriations process is the DOD, which develops a funding request for ongoing operations and submits it to the OMB for approval before resources are formally requested. The inclusion of the DOD, as an executive agency with its own interests, differentiates this model from those described in the previous literature. Those studies typically assumed executive agencies have the same interests as the president, focusing their analysis on the interactions between the president and Congress in making overall funding decisions. Inclusion of the DOD in this case is necessary based on the additional influence the DOD has in the supplemental appropriations process relative to the normal process. The DOD constructs a supplemental appropriations request, ensuring that the request includes at least the minimum level of resources necessary to conduct military operations. However, the overarching motivation of the DOD in this model is to maximize the total resources available for both contingency and annual operations.

In its funding request, the DOD prefers flexibility in wartime appropriations since future operational costs may be difficult to forecast.³⁶ Flexibility here refers to the ability to pay for activities across various budget titles; for example, in 2002 Congress appropriated \$11.3 billion, 83 percent of 2002 wartime appropriations, into an account called the Defense Emergency Response Fund (DERF). The appropriations bill stated that resources in the DERF were available for transfer into other spending accounts by the Secretary of Defense.³⁷ In funding the DERF, Congress used this fund to "delegate budget authority to DOD" allowing "flexibility in times of crisis, to provide obligation

³⁶ Miller, Richard M., *Funding Extended Conflicts: Korea, Vietnam, and the War on Terror*, Westport, Connecticut: Praeger Security International, 2007, 110-111.

³⁷ U.S. Congress, *Making Emergency Supplemental Appropriations for Further Recovery from and Response to Terrorist Attacks on the United States for the Fiscal Year ending September 30, 2002*, P.L. 107-206, Ch. 3, "Department of Defense," 2002.

authority when a need arises, but before the specifics of the need are known."³⁸

DOD's funding request is also constrained by either an explicit or implicit signal from the president on the limits of operational funding. A few examples of this signal have appeared in historical and recent funding requests that have shown executive willingness to either accept additional funding or a desire to limit wartime spending. In 2006, Deputy Secretary of Defense Gordon England issued guidance to the military services to expand their funding requests for efforts related to operations in general, not just those in Iraq and Afghanistan.³⁹ Alternatively, Miller (2007) reports that in 1970 President Nixon reduced the wartime budget for Vietnam such that "fiscal constraints even began to dictate military operations."⁴⁰ Thus, the model predicts that though the DOD develops and submits the supplemental requests, it still faces some constraint on the total amount of funding it may request in wartime supplemental appropriations.

Assuming that the DOD behaves strategically when developing its wartime funding requests, the department anticipates likely Congressional changes to the appropriations bill during the legislative process and recognizes that the supplemental request is a limited opportunity to seek additional funding that may be directed towards other interests. Hence, the theory predicts that requests would include more funding than is necessary under current operational plans, especially in areas where Congress is likely to appropriate less than what the DOD requests. Additionally, some portions of the request will have limited relevance for operations but will still be put forth as necessary wartime expenditures. For example, the DOD may move some items from the base budget to the supplemental, may seek to fund new items

³⁸ Candreva and Jones, 1-19.

³⁹ Fitzgerald, Erin K., and Anthony H. Cordesman, *Resourcing for Defeat: Critical Failures in Planning, Programming, Budgeting, and Resourcing the Afghan and Iraq Wars*, Washington, DC: Center for Strategic and International Studies, 2009, 8-9.

⁴⁰ Miller, 60.

that would traditionally be in the base, or may add previously unfunded items in the supplemental requests.

The second active participant in this model is Congress, which receives the request for and decides whether to pass supplemental appropriations. The appropriations process presents Congress with an opportunity to approve and influence ongoing operations through determining the total amount and allocation of the supplemental appropriations. Congress also dictates the level of resource flexibility and executive reporting requirements. Using its budgetary authority, Congress may also choose to constrain operations through restricting the use of appropriated funds to certain activities or regions.⁴¹ Congress considers the presidential veto power while making its appropriations decisions.

Conceptually, Congress will use supplemental appropriations bills to fund operations while also working to advance the political interests of its members. To build political capital for Congressional members, supplemental appropriations will include overt support for service members due to their ongoing personal sacrifices during military operations. This Congressional support for service members could fade based on diminishing interests of their constituencies, but throughout recent operations American's confidence in its military service members remained high, with Gallup reporting that Americans continuously ranked the military as the institution they are most confident in since 1998.⁴² Additionally, the theory predicts that Congress will direct some funding towards other constituency interests while also including other potentially politically sensitive provisions to build political capital with their constituencies. The expected outcomes from this stage in the

⁴¹ Grimmett, Richard F., *Congressional Use of Funding Cutoffs Since 1970 Involving U.S. Military Forces and Overseas Deployments*, CRS Report RS20775, Washington, DC: Congressional Research Service, January 10, 2001.

⁴² Saad, Lydia, "Americans' Confidence in Military Up, Banks Down," Gallup, June 14, 2009, Accessed March 15, 2011: <http://www.gallup.com/poll/121214/Americans-Confidence-Military-Banks-Down.aspx>

process are that, while the total amount of funding may be similar to the request, there will be a shift in the accounts that are funded in the final appropriations bill. Funding will likely shift from the O&M title towards investments since these will pay for items developed or built by constituents, and service members will receive greater provisions than the DOD requests. Finally, Congress may include additional appropriations or policy in the supplemental appropriations bills it passes.

The final participant in this model is the president who has the opportunity to sign or veto the bill passed through Congress. The influence of the veto in the supplemental appropriations process is weaker than it is for normal situations for several reasons. As mentioned above, there is not a back-up process for supplemental appropriations as there is for a normal appropriations bill. Additionally, the president faces a high level of uncertainty about what Congress may include in subsequent bills should he veto the one presented to him. The threat point in this interaction is no funding until a bill is passed by Congress and signed by the president. During the passage of the supplemental appropriations, Congress will take this into account and will be able to add provisions that may not have survived the normal appropriations process. The model predicts that the president will only veto wartime supplementals when they constrain the overall goals of military operations.

The model described above focuses on decisions made during a step-by-step process as a request moves from the DOD to Congress and a bill moves from Congress to the president. However, this is a repeated event and the dynamic nature of the participants and their constituencies may lead to different outcomes over time. For example, if the composition of Congress changes in a way such that its position on the war moves away from the president's position, the veto influence may be further weakened leading to larger shifts in funding or more provisions added during the legislative process. The theoretical examination of the supplemental appropriations process leads to several hypotheses about expected outcomes for wartime supplemental appropriations bills and the various defense spending accounts within them.

PREDICTED OUTCOMES FROM THE THEORETICAL MODEL

The first significant action in the supplemental appropriations process is the DOD's development of a supplemental request. The model predicts that the DOD will use the supplemental requests as an opportunity to fund additional items or programs that were not funded in the base. The DOD may do this by shifting some programs from the base into the supplementals, partially fund programs in both the base and supplementals or introduce programs in supplementals that are similar to those in the base. These activities may be found in any of the major spending categories; thus, Hypothesis 1 states that the DOD requests include items that are normally found in the base budget.

Several hypotheses focus on the allocation of the supplementals among the various appropriation titles. The military personnel title in a supplemental appropriations bill is typically used to provide "incremental pay, special pay, and entitlements above the normal monthly personnel compensation for military personnel participating in or directly supporting ongoing military operations."⁴³ This includes the pay of Reserve Component and National Guard members in excess of what they would receive in peacetime. This account has also been used to fund temporary increases in personnel strength.⁴⁴ The theory claims that Congress is generally supportive of service members and should fully fund requests for this account. Furthermore, the DOD anticipates Congressional willingness to provide these payments. The DOD prefers more funding, which in this case would allow additional deployed personnel, but faces a constraint related to the total force size for deployment. Additionally, calculations of military personnel costs are based on the total number and component of personnel the DOD expects to deploy. Hypothesis 2 is that the military personnel request is likely close to the actual appropriation. However, since fully funding the

⁴³ U.S. Department of Defense, *FY2005 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Unified Assistance*, Washington, DC: Department of Defense, February 2005, 14.

⁴⁴ *Ibid.*, 16.

account does not necessarily provide overt support for service members, Hypothesis 3 predicts that the bills will include other provisions supporting service members.

The O&M title is fairly flexible, being used to fund most activities in support of military operations. These include activities like "ground combat operations, flying hours, military intelligence activities, logistics support, fuel purchases, base support, depot maintenance and over-ocean transport."⁴⁵ The framework developed above posits that Congress will seek to shift funding towards areas that help their constituencies and see this as an account from which to make these changes. The DOD will anticipate these downward funding shifts resulting in an O&M request that is greater than necessary for current plans. Hypothesis 4 states that the O&M appropriations are less than what the DOD requests but not to the extent that funding limits ongoing operations.

The investment accounts provide resources to acquire "combat vehicles, aircraft, weapons, communications, and other equipment" as well as the development of new items that may be used for military operations.⁴⁶ Investment accounts fund both the purchase of new items and the modification of existing equipment along with the reconstitution of items damaged during military operations. The theory states that Congress will see these accounts as a way to invest in constituency interests while also funding military operations. The DOD will expect Congress to make these additions so will not request more than necessary, but will include items that would typically be in the annual budget in the request. Hypothesis 5 states that the amounts requested for investments from the DOD are less than the appropriations provided by Congress.

Finally, the model also predicts Hypothesis 6, that there will be unrequested additions to supplemental appropriations bills, many of

⁴⁵ U.S. Executive Office of the President, Office of Management and Budget, *Fiscal Year 2008 Budget of the United States Government*, Washington, DC: Government Printing Office, 2007, 1146.

⁴⁶ Ibid, 1154-1161.

which are unrelated to military operations and would not pass in other circumstances. These additions pass due to the president's weakened veto power along with the urgency placed on wartime appropriations. Evidence for this predicted outcome requires examining the different provisions added to supplemental appropriations bills along with the legislative and executive support for these different provisions.

This model predicts six specific outcomes:

Hypothesis 1: DOD's wartime requests include items normally found in the base budget.

Hypothesis 2: Military personnel appropriations are close to the request.

Hypothesis 3: Congress adds other provisions supporting service members.

Hypothesis 4: Congress does not appropriate as much O&M funding as DOD requests.

Hypothesis 5: Investment appropriations are greater than DOD requests.

Hypothesis 6: Unrequested and unrelated provisions are added to supplemental appropriations bills.

The next chapter presents an examination of how well the theory describes wartime supplemental appropriations from 2004 through 2009 using these hypotheses.

3. ANALYSIS OF WARTIME SUPPLEMENTAL REQUESTS AND APPROPRIATIONS

The theoretical model described above predicts that the extended use of the supplemental appropriations process leads to exaggerated funding requests, especially those related to operational costs, with additional resources allocated to procurement and personnel. This chapter applies data from recent military operations to examine the hypotheses derived from the theoretical model of wartime supplemental appropriations. The chapter concludes with a discussion highlighting the consequences from long term reliance on supplemental appropriations to pay for military operations through 2009.

Analysis of this theoretical model requires data from both supplemental requests and appropriations. Appendix A details a dataset that covers wartime requests and appropriations, spanning from 2001 through 2012, developed for the analysis in this dissertation. Official DOD and presidential requests for supplemental appropriations served as the basis for the request section of the data. The appropriations bills and accompanying reports provided data on the budget authority provided to the DOD for the conduct of these operations. The data analysis in this chapter focuses on the requests and appropriations from 2004 through 2009.⁴⁷

⁴⁷ In 2002 most of the funds requested and appropriated were provided in the DERF, a flexible account. In 2003, the OMB requested Congress to appropriate 96 percent of the DOD's wartime request to the DERF; although providing almost all of the resources requested for 2003, Congress only allocated about 25 percent of the appropriations in a flexible account, titled the Iraq Freedom Fund (IFF). Similarly, in late 2004 the DOD requested an additional \$25 billion in supplemental appropriations to be allocated in the IFF as a bridge fund to cover operational costs in early 2005, but Congress allocated only 15 percent of these funds to the IFF. Requests and appropriations that primarily focused on these flexible transfer accounts do not allow analysis of differences in how the DOD and Congress intended these resources to be used. Thus, the analysis in this chapter excludes 2001 through 2003 and the 2005 bridge.

In addition to budgetary data, the results of semi-structured interviews with participants in the defense budgetary process provided additional information regarding the identified trends. The participants for these interviews included respondents from the executive and legislative branches who participated in the budgeting process during this period. Appendix B highlights the protocol used for these interviews.

DOD REQUESTS INCLUDE ITEMS NORMALLY FOUND IN THE BASE BUDGET

Hypothesis 1 predicts that the DOD recognizes a limited opportunity to pay for some otherwise unfunded activities through supplemental appropriations. In order to do this, the department seeks to fund activities in supplemental appropriations that have the characteristics of items that are normally a part of the annual budget and which may also be identified as wartime requirements. The base budget funds activities that sustain a national defense capability and includes activities such as basic pay for personnel, training military organizations, and the development and acquisition of military systems.

The DOD included several activities in requests for personnel funding that would typically be found in the base. The base military personnel budgets include funding for items like basic pay, allowances, and bonuses for active-duty personnel, training pay for members of the National Guard and Reserve Components, recruiting and retention initiatives, and permanent change of station travel. The DOD requests for supplemental appropriations from 2004 through 2009 included funding to allow the Army and Marine Corps to maintain "above normal strength levels."⁴⁸ These temporary end strength increases were justified as wartime requirements that would allow the Army and Marine Corps to fulfill their operational requirements while the wars persisted.

Interviews revealed that the rationale for requesting these expansions in wartime funding was that budgeting for additional

⁴⁸ U.S. Department of Defense, *FY2005 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Unified Assistance*, February 2005, 16.

personnel within the base budget could lead to the acceptance of a permanent increase in end strength. At the time, leadership in the department felt that permanent growth was not required and would not be financially sustainable upon the termination of operations. They believed that the costs of the expansion were directly attributable to the war and did not want this growth to migrate to the base defense program. However, interviewees also indicated that pressure from the Army and Marine Corps as well as from Congress led the temporary personnel increases to eventually become identified as permanent. From 2006 through 2010, the Army's end strength grew by 13 percent or 65,000 personnel while the Marine Corps grew by about 8 percent or about 27,000 personnel.

In this case, the department expected that inclusion of a base activity within the wartime budget would maintain base budget stability beyond ongoing operations. The DOD decided not to make current military personnel funding tradeoffs in the base in order to ensure that future trades would not be required. This decision also influenced future budget deficit projections; these temporary personnel increases, though meant to last a number of years, were not counted in projected annual budgets allowing the administration to claim future spending reductions that would not occur unless end strength was reduced to previous levels. However, over time these increases became permanent and were moved into the base budget.

The DOD also requested additional wartime funding under the military personnel title to support recruiting and retention initiatives from 2005 through 2009. The department identified these as wartime expenses; interviews revealed that these requests were included in the supplemental requests after the department recognized that the military services did not provide enough for recruiting and retention in their regular budgets. In this way DOD used its requests for supplemental appropriations to revisit emerging budgetary issues during the course of the year without making tradeoffs within the annual budget.

The Army and Marine Corps also requested funding, primarily for procurement, in supplemental appropriations to support major force structure changes. They defended these requests as allowing for

accelerated transformation for units that were deploying, but some items, like tracked combat vehicles, often had limited use in the theaters where these units were deploying. Additionally, units often did not deploy with all of the equipment they would use during conventional operations.

The data support the outcome predicted by Hypothesis 1: DOD requested additional wartime funding for many items that are normally a part of the base budget. This allowed the DOD to use supplemental appropriations requests to expand defense spending beyond the minimum level required for operations. By including items normally found in the base, the DOD was largely able to avoid difficult resource tradeoffs within its annual budget because funding items typically included in the base budget through supplemental appropriations "frees up funding under discretionary caps not only for other defense programs, but also for non-defense discretionary accounts."⁴⁹ This manifested itself primarily in the military personnel and investment budgets for different reasons and with different effects.

Even though the DOD avoided many resource tradeoffs, changing operational conditions weighed most heavily on the composition of the request, and the department made some tradeoffs between traditionally desired systems and equipment needed for operations within its supplemental requests. For example, in February 2007, the president submitted an initial request for supplemental appropriations to cover operations in 2008. This request included funds for five C-130J aircraft, one CV-22, and two Joint Strike Fighters. The administration revised its request in March removing these items in order to "better align resources based on the assessment of military commanders."⁵⁰

⁴⁹ Daggett, Stephen, et. al., *FY2007 Supplemental Appropriations for Defense, Foreign Affairs, and Other Purposes*, CRS Report RL33900, Washington, DC: Congressional Research Service, July 2, 2007, 29.

⁵⁰ U.S. Executive Office of the President, Office of Management and Budget, "A Request for Congress to Revise the FY2007 Department of Defense Supplemental Request Proposed in the FY2008 Budget," Washington, DC: U.S. Government Printing Office, March 12, 2007.

The idea that supplemental appropriations requests extended beyond what was needed for operations was contentious among those interviewed for this report. About half of those interviewed felt that all of the things included in DOD's requests for war funding were related to the war in one way or another. Several emphasized that the Office of the Secretary of Defense (OSD) only allowed the military services to procure equipment that they intended to use during the war or that replaced operational losses; additionally, procurement funds could not be requested for equipment if the delivery time extended beyond the normal time frame for delivery of the system acquired. However, most respondents mentioned that the way the DOD and OMB defined wartime expenses was not entirely clear through 2009, was often debated, and that this definition changed over time. OMB worked with the DOD in 2009 to clarify the guidelines regarding acceptable war related expenses.

Interviewees who felt that wartime requests went beyond what was needed for operations noted that the military services often worked to get things funded in supplementals if they could not get them approved as part of the base budget. One respondent explained that the supplementals provided the military services, especially the Army, a way to recover from reduced procurement funding in the 1990s, while another commented that the supplemental requests were a "rush for gold."

Even though the idea that the defense budget was expanded beyond what was needed for operations is contentious, supplemental appropriations provided a mechanism for the military services to avoid making difficult trades within their base budgets by allowing them to include programs normally found in the base as wartime expenses. This permitted the services to pursue major force structure changes along with equipment modernization programs in a much more rapid way than if the annual budget had been the sole source of this funding.

MILITARY PERSONNEL

Funding for the military personnel title accounts for about 14 percent of the total requests and appropriations provided for military operations from 2004 through 2009. Hypothesis 2 predicts that military personnel appropriations should be close to what is requested, while

Hypothesis 3 predicts that Congress will express support for service members by adding other measures to these appropriations bills. Table 3.1 provides a comparison between personnel funding requests and appropriations.

During this timeframe, Congress never appropriated less than the DOD requested for military personnel. Furthermore, this trend also holds for personnel requests and appropriations for each of the individual services. The more striking outcome highlighted in Table 3.1 is that the additions to the military personnel account were greater than predicted by Hypothesis 2; Congress appropriated significantly more than DOD requested from 2007 through 2009.

Table 3.1
Difference between Military Personnel Requests and Appropriations

Current \$M	2004	2005	2006	2007	2008	2009
Request	17,813	16,869	15,800	17,752	17,840	17,381
Appropriation	17,813	17,447	16,489	18,894	19,138	19,920
Percent Difference	0%	3%	4%	6%	7%	15%

Sources: Calculations based on presidential requests for appropriations, DOD justification documents and Public Laws

The additional funding for the military personnel title largely reflects Congressional use of wartime supplemental appropriations bills to augment the annual personnel budget. In 2006, Congress allocated about \$690 million more than requested for personnel costs with about \$560 million extra directed towards the Navy. This additional funding for the Navy was provided largely to restore \$300 million that had been "cut from the regular budget in a government-wide 1 percent across-the-board cut to offset additional Gulf Hurricane monies."⁵¹ The funding for the Navy also added \$200 million for recruiting and retention incentives, likely in response to recruiting and retention challenges

⁵¹ Irwin, Paul M. and Larry Nowels, *FY2006 Supplemental Appropriations: Iraq and Other International Activities; Additional Hurricane Katrina Relief*, CRS Report RL33298, Washington, DC: Congressional Research Service, June 15, 2006, 33.

reported by the Naval Reserve that year.⁵² Congress allocated an additional \$1.1 billion in the 2007 supplemental that was primarily focused on the Army and Marine Corps to "cover a shortfall in basic allowances for housing" that had been included in the services' Unfunded Priorities List for 2008.⁵³

In 2009, Congressional appropriations were again higher than the services' supplemental requests for military personnel, covering funding shortfalls in the regular budget, but they were much larger than in previous years, totaling \$2.5 billion. Much of the 2009 increase focused on providing additional funding for "unanticipated adjustments to rates for pay and benefits and higher strength levels reflecting better-than-anticipated recruiting and retention," especially in the Army.⁵⁴ While the additional funding to cover these recruiting adjustments reflected successful outcomes of a dynamic recruiting environment, Congress also provided an increase in military pay that was one half percent higher than requested.⁵⁵ Increases in military pay are normally included in the annual authorizations process.

The practice of adding unrequested funding or allocating for future unfunded priorities for military personnel in supplemental appropriations highlights Congressional desire to express strong support for military service members. In addition to providing additional resources for military personnel, Congress also expanded pay and benefits for service members and veterans through adding policy

⁵² Ibid. and Congressional Budget Office, *Recruiting, Retention, and Future Levels of Military Personnel*, Washington, DC: Congresssional Budget Office, October 2006. 54-55.

⁵³ Daggett, Stephen, et. al., 2007, 30 - 35.

⁵⁴ Daggett, Stephen, et. al., *FY2009 Spring Supplemental Appropriations for Overseas Contingency Operations*, CRS Report R40531, Washington, DC: Congressional Research Service, July 15, 2009, 26 and Department of Defense, News Release, "DOD Announces Recruiting and Retention Numbers for Fiscal 2009," October 13, 2009 Accessed January 12, 2011 at: <http://www.defense.gov/releases/release.aspx?releaseid=13041>.

⁵⁵ Ballenstedt, Brittany R., "Senate Sends 3.9 Percent Pay Raise to President Bush," *Government Executive.com*, September 29, 2008, accessed November 9, 2010 at: <http://www.govexec.com/dailyfed/0908/092908b1.htm>.

provisions and unrequested resources in supplemental appropriations bills as predicted by Hypothesis 3. Some policy changes included in supplemental appropriations bills will have a lasting impact on both the defense and Veteran's Affairs budgets. Table 3.2 highlights some of these provisions along with their characteristics.

Table 3.2
Congressional Provisions Added To Support Military Service Members

Year	Provision	Requested	Type
2003	Incremental Deployment and Combat Pay	No	Policy
2004	Health Insurance Added for Reservists	No	Policy
2005	Life Insurance and Death Benefits	Yes	Policy
2007	Resources for Veteran's Affairs	No	Appropriation
2008	Education Benefits for Veterans	No	Policy
2009	Pay for Members Affected by Stop-Loss	No	Appropriation

Sources: Public Laws and *Congressional Quarterly Almanacs* 2003-2007.

During the course of recent operations, Congress introduced policy changes that provided additional compensation for service members while deployed. This began in 2003 when Congress increased the amounts of some of the incremental payments service members receive during deployments. Imminent Danger Pay (IDP) increased from \$150 to \$225 per month while the Family Separation Allowance (FSA) increased from \$100 to \$250 per month for eligible service members.⁵⁶ This change was effective only for service members deployed during 2003; however a subsequent supplemental appropriations bill in 2004 extended the increases in IDP and FSA for one year while the National Defense Authorization Act (NDAA) of 2005 made these rates permanent.⁵⁷

⁵⁶ U.S. Congress, *Making Emergency Wartime Supplemental Appropriations for the Fiscal Year 2003, and for Other Purposes*, P.L. 108-11, Sec. 1316, 2003.

⁵⁷ U.S. Congress, *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005*, P.L. 108-375, Sec. 623, "Permanent Increases in Authorized Amounts for Imminent Danger Special Pay and Family Separation Allowance," 2005.

On September 22, 2003 President Bush signed a supplemental appropriations bill providing funds for operations during 2004 that included a provision expanding eligibility for TRICARE health insurance to certain members of the Selected Reserve and Ready Reserve forces for a period of one year.⁵⁸ The president had earlier expressed opposition to this provision, and he threatened to veto the NDAA that year if it included a similar measure.⁵⁹ However, these benefits were extended in the NDAAs passed in 2004, 2005, and 2006, while the 2007 NDAA made this program permanent.

In the 2005 supplemental, the DOD requested and received increases in life insurance and death benefits for service members that were retroactive to 2001. The maximum life insurance coverage under the Service Members Group Life Insurance (SGLI) increased from \$250,000 to \$400,000 while the Death Gratuity increased from \$12,240 to \$100,000. Furthermore, the bill provided a new insurance rider for traumatic injury protection of up to \$100,000.⁶⁰

In each of the examples described above, supplemental appropriations bills provided a way to introduce policy changes that expanded benefits offered to service members. Once introduced for a limited term, these benefits were addressed in future legislation, typically the annual NDAA, where Congress made them permanent. In each of these examples, the benefits were either not requested or were more generous than the president included in his request to Congress.

The supplemental appropriations bill passed for operations in the second half of 2009 included a provision that paid service members \$500 per month if their service obligation had been extended by the stop-loss

⁵⁸ The provision stated that in order to be eligible for the expanded benefits, service members must either be unemployed or not have access to health insurance through their employer.

⁵⁹ Congressional Quarterly, *Congressional Quarterly Almanac 2003*, Washington, DC: Congressional Quarterly Press, 2003, 2-83 - 2-86.

⁶⁰ U.S. Congress, *Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Tsunami Relief, 2005*, P.L. 109-13, Sec. 1012, 1013, and 1032, 2005.

policy.⁶¹ The bill appropriated \$534 million to the DOD to execute this new benefits program. This benefit is substantially different than those described above in that it did not introduce a long term policy, but it provided an additional benefit for specific service members over a shorter period of time.

In 2007 and 2008, Congress added provisions to benefit veterans that largely affected the budget of the Department of Veterans' Affairs. Due to "reports of shortcomings the medical care for wounded veterans," the supplemental appropriations bill in 2007 included \$1.8 billion in unrequested funding, including \$1.3 for healthcare, directed to the Department of Veterans' Affairs.⁶² In 2008, Congress expanded education benefits for veterans based on the "Post 9-11 G.I. Bill" which had been previously introduced by Senator Jim Webb but had not passed.⁶³ The expanded benefits also included a provision allowing service members to transfer their education benefits to dependents.⁶⁴ Congressional inclusion of additional funding and expansion of veterans' educational benefits further signals the desire to devote additional resources to service members.

OPERATION AND MAINTENANCE

From 2004 through 2009, about half of DOD's wartime supplemental appropriations were directed towards O&M titles, which are used to pay for a myriad of activities. Hypothesis 4 predicts that Congress would tend to provide less O&M funding than requested by the DOD, which would request more O&M funds than necessary anticipating this Congressional action. Identification of these outcomes requires first recognizing that

⁶¹ Stop-loss is a policy enacted several times during recent military operations that involuntarily extended a service member's current service obligation if that obligation would have expired while the member's unit was deployed.

⁶² Daggett, Stephen, et. al., 2007, 29, and Congressional Quarterly, *Congressional Quarterly Almanac 2007*, Washington, DC: Congressional Quarterly Press, 2007, 2-53 - 2-59.

⁶³ U.S. Congress, *Post-9/11 Veterans Educational Assistance Act of 2007*, S.22, 2007.

⁶⁴ Daggett, Stephen, et. al., 2007, 6 - 7.

Congress did provide less than requested and second that these funding shortfalls did not limit DOD's ability to operate. Table 3.3 provides a comparison between O&M funding requests and appropriations.

Table 3.3
Difference between O&M Requests and Appropriations

Current \$M	2004	2005	2006	2007	2008	2009
Request	41,083	38,246	73,326	91,648	91,721	88,884
Appropriation	40,273	37,779	69,136	91,244	92,034	86,895
Percent Difference	-2%	-1%	-6%	0%	0%	-2%

Sources: Presidential requests for appropriations, DOD justification documents, and Public Laws

Table 3.3 highlights that the general trend predicted by Hypothesis 4 held for every year except 2008. In 2008, Congress appropriated slightly more than the total requested for O&M, allocating \$2.1 billion more than requested into accounts that allowed for transfers to other spending titles. Even though the general trend held during most of the period, Congress did not provide a significant amount less than the total requested for O&M in any of these years, with the shift away from O&M spending being quite small. However, a closer inspection of the data reveals that other aspects of the model may explain this relatively small shift away from O&M, since some O&M funding is used to directly support service members.

Healthcare for military service members is funded within O&M under the Defense Health Program, which received a significant funding boost in supplemental appropriations by Congress in some years. These increases focused on improving the facilities where service members are treated, paid for scientific research on common war related health issues for service members, and sought to increase healthcare access for service members and their families. Even though these activities must be funded through O&M, the increase in funding over the request further reinforces the theory as it relates to Congressional emphasis on benefits for service members. Accounting for these changes to funding for healthcare provides a better picture of appropriations for O&M.

Table 3.4 highlights O&M appropriations with health related costs removed.

Table 3.4
Difference between O&M Requests and Appropriations, Less Defense Health

Current \$M	2004	2005	2006	2007	2008	2009
Request	40,425	38,070	72,172	90,575	90,584	86,875
Appropriation	39,615	37,656	67,983	88,692	90,120	84,740
Percent Difference	-2%	-1%	-6%	-2%	-1%	-2%

Sources: Calculated from presidential requests for appropriations, DOD justification documents and Public Laws

In each year from 2004 through 2009, Congress provided less O&M funding than requested for military operations. The reduction to requested O&M appropriations over this period amounts to about \$11.1 billion (2011 \$) less than requested. However, these reductions did not reduce the military's ability to conduct overseas operations. All of the respondents interviewed during the course of this study noted that military operations around the world were never constrained due to a lack of funding. Most also noted that additional funding from either supplemental or Title IX appropriations was vital for wartime operations.

2004 appears to have been the only year when DOD faced a shortfall in O&M funds through the course of recent operations, but the anticipated shortfall that year was not due to Congressional underfunding of O&M titles. In July 2004, the Government Accountability Office (GAO) indicated that the DOD would fall about \$13 billion short in wartime O&M funding for the year.⁶⁵ However, Congress only appropriated about \$800 million less than the DOD requested for O&M that year. Instead, the GAO report attributes the expected shortfall to

⁶⁵ U.S. Government Accountability Office, *Military Operations: Fiscal Year 2004 Costs for the Global War on Terrorism Will Exceed Supplemental, Requiring DOD to Shift Funds from Other Uses*, Washington, DC: GAO, July 23, 2004, 7.

overly optimistic assumptions about troop levels, means of deployment, and types of equipment needed in Iraq.⁶⁶

The second half of 2004 was very challenging in Iraq as the situation in many parts of the country began to deteriorate in March and April. U.S. forces began and ended a large offensive operation in Fallujah in early April; meanwhile, U.S. forces clashed with the Mahdi Army of Moqtada Al-Sadr throughout southern Iraq. Allawi (2007) states that at this time "important constituencies in both the Shi'a and Sunni communities simultaneously rose up in arms in two widely separate locations."⁶⁷ The spike in operations surrounding these events required a larger than expected force with a much higher rate of operations than anticipated. In July 2004 Congress appropriated \$25 billion in Title IX of the annual appropriations bill designed to cover the first few months of 2005, but made funds available at the time of passage in order to cover the expected deficiency. Miller (2007) explains that the DOD used about \$2.2 billion to cover these funding shortfalls in 2004.⁶⁸

While the military services were not restricted due to an insufficiency of funding from Congress, the timing of passage for some of the supplementals led to increased tension between the executive and legislative branches of government. The requests for wartime funds became an opportunity for policy debate since control of funding provides Congress with its greatest source of leverage to influence strategy. Over time some in Congress began to question how quickly the DOD needed to receive funding from supplemental appropriations. In 2006, 2008, and 2009 the spring wartime supplemental appropriations bills were not passed until June, leaving only about three months remaining in the fiscal year for obligation. While this did not curtail wartime operations, it may have negatively impacted annual operations.

The DOD prioritizes funding for overseas operations, borrowing against the end of year resources while anticipating passage of

⁶⁶ Ibid., 8-9.

⁶⁷ Allawi, Ali A., *The Occupation of Iraq: Winning the War, Losing the Peace*, New Haven, Conn: Yale University Press, 2007, 266.

⁶⁸ Miller, 97.

supplemental appropriations. When supplementals provide these resources late in the year, the funds may become difficult to obligate, and activities may be curtailed from the base while waiting for funding. This occurred in 2006 when the Army stopped orders for noncritical maintenance, cancelled nonessential travel, and postponed civilian hiring.⁶⁹ Thus, while the Congressional response to requests for wartime O&M funding has not reduced the pace or scale of overseas operations, the timing of passage had some impact on the annual defense program.

INVESTMENTS

Funding in the various investment titles made up about 25 percent of the DOD's supplemental appropriations from 2004 to 2009. These accounts are typically used to develop and purchase new equipment as well as upgrading other pieces of equipment. The DOD used wartime investment funding to replace equipment destroyed in combat, acquire equipment needed in theater, recapitalize lost or damaged equipment, and upgrade systems for operations. Interviews indicated that investment requests are the area where the most questions regarding relevance to ongoing operations arise because spending takes place over a longer time horizon and the systems procured may not enter the force for several years. Hypothesis 5 predicts that Congress will typically appropriate more than requested for DOD's investments. Table 3.5 provides a comparison between investment funding requests and appropriations.

Table 3.5
Difference between Investment Requests and Appropriations

\$M (Current)	2004	2005	2006	2007	2008	2009
Request	5,588	16,593	23,370	50,851	85,054	30,912
Appropriation	5,871	17,966	26,969	53,342	72,239	33,164
Percent Difference	5%	8%	15%	5%	-15%	7%

Sources: Presidential requests for appropriations, DOD justification documents and Public Laws

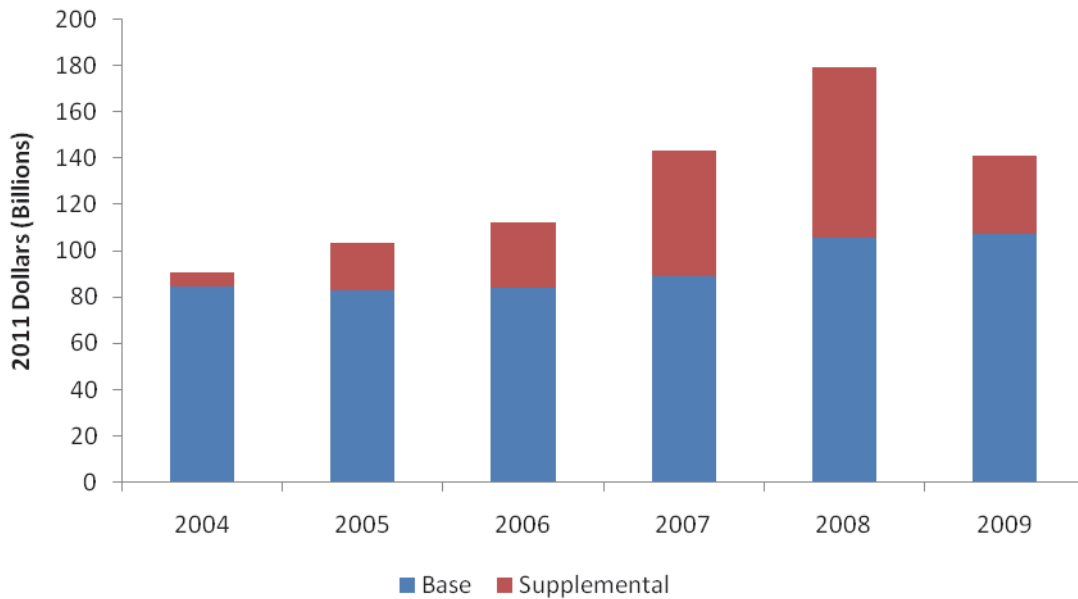
⁶⁹ Jones and McCaffery, 312-313.

From 2004 through 2009, Congress typically provided the DOD more investment funds than requested. During this time period, 2008 was the only year when Congress did not appropriate more for investments than requested. In 2008, Congress appropriated \$12.8 billion less than the department requested for investments, but the DOD could offset some of this reduction in funding by obligating some of the \$2.1 billion in additional funds appropriated to flexible O&M titles. Examining the changes from the DOD's requests to appropriations passed does not fully capture how investment spending changed during the course of recent operations. Deeper inspection into how the DOD's requests for wartime investment evolved along with the appropriations provided in response to these requests is necessary.

In 2006, the Deputy Secretary of Defense Gordon England issued guidance for the services to expand their wartime funding requests "to include incremental costs related to the longer war against terror (not just OEF/OIF)."⁷⁰ Procurement requests, which make up the larger portion of wartime investments, greatly increased after the issuance of this guidance, nearly doubling from 2006 to 2007 and increasing by an additional 50 percent in 2008. Interviewees noted that policy for procurement requests once again become more stringent in 2009 when the OMB provided official guidance highlighting the criteria for wartime requests. OMB's guidance along with smaller amounts requested for MRAPs led to a reduction of the procurement request by about 60 percent in 2009. Figure 3.1 highlights the DOD's requests for procurement in both the supplemental and base budgets during this time period. Throughout this time, the base procurement request remained relatively stable while the wartime related requests rapidly grew through 2008.

⁷⁰ England, Gordon, Memorandum for Secretaries of the Military Departments, "Ground Rules and Process for FY '07 Spring Supplemental," October 25, 2006.

Figure 3.1
DOD Procurement Requests from 2004 through 2009 (2011 \$ Billions)



Sources: President's Budget Submissions, Requests for Supplemental Appropriations, DOD justification documents

Further analysis of each of the services' procurement titles shows that the requests grew primarily in a few important areas. In 2007, over 60 percent of the growth in the wartime procurement requests was focused on just four procurement titles, which funded combat vehicles and other equipment for the Army and aircraft for the Air Force and Navy. About 60 percent of the growth in the procurement requests for 2008 was focused on procuring MRAPs with another 30 percent focused on other procurement for the Army, which was largely devoted to tactical vehicles and communications equipment.

By 2008, the DOD's wartime procurement request grew to 66 percent of the base procurement request, and for the only time during this period Congress refused to appropriate the full amount requested. There were more subtle changes from the request to the appropriation as Congress shifted funding between many different investment accounts. Table 3.6 highlights changes that Congress made within different investment accounts throughout this period. Boxes highlighted in green indicate areas where Congress appropriated over \$100 million more than

requested while those highlighted in blue are accounts where Congress appropriated over \$100 million less than requested.

Table 3.6
Difference Between Investment Requests and Appropriations by Service
(2011 \$ Millions)

Service	Sub Account	2004	2005	2006	2007	2008	2009
DW	MRAP	NA	NA	NA	3,178	1,944	1,902
	DW - Proc	-19	116	0	-273	48	35
	DW - RDT&E	-6	55	3	-146	-563	-174
AF	Aircraft Proc	15	9	353	402	3,339	2,276
	Ammo Proc	0	0	0	-95	105	-26
	Missile Proc	0	0	-86	-48	68	-8
	Other Proc	-1	-162	25	-143	-2,154	-52
	RDT&E	0	44	361	-35	-1,220	-264
Army	Aircraft Proc	0	0	0	-8	-237	419
	Ammo Proc	0	185	0	0	-15	-110
	Missile Proc	-7	18	0	-51	-83	-65
	Other Proc	242	1,870	-1,046	-1,149	-4,921	-1,318
	W&TCV Proc	63	195	690	-104	-413	309
	RDT&E	0	13	-375	-17	-21	-214
Navy	Aircraft Proc	34	87	394	380	-309	37
	Ammo Proc	0	40	0	0	0	0
	Other Proc	0	-8	0	-134	-338	-70
	Weapons Proc	0	-6	0	-8	-1	-72
	MC Proc	0	507	0	-1,126	-258	-192
	RDT&E	0	28	-16	-171	-409	-206

Sources and notes: Presidential requests for appropriations, DOD justification documents and Public Laws. W&TCV is Weapons and Tracked Combat Vehicles while MC is Marine Corps. The title other procurement is used to purchase things like vehicles, communications, materials, and spare parts that are generally not covered in the other titles. DW is used to represent Defense Wide appropriations.

In 2008, Congress focused reductions from the request on three investment accounts associated with Other Procurement in both the Army and Air Force along with Air Force research and development. Though it often received less than requested, the DOD requested and received more wartime funding for the Army Other Procurement title than any other procurement title from 2005 through 2009. Even though the total wartime investment appropriations were less than requested in 2008, Congress

appropriated \$3.3 billion more than requested for Air Force aircraft and \$1.9 billion more for MRAPs. Every year from 2004 to 2009, Congress appropriated more for Air Force aircraft and MRAPs than requested. These shifts in appropriations were common throughout the period and indicate Congressional emphasis on aircraft and force protection through wartime appropriations.

Overall, Congress typically acted in a manner consistent with the prediction of Hypothesis 5 through emphasizing investment spending. The only time Congress refused to provide the DOD with the total amount requested was in response to rapid growth in funding requests, but Congress still added some funds to programs it typically favors.

SUPPLEMENTALS WERE USED TO PASS ADDITIONAL LEGISLATION

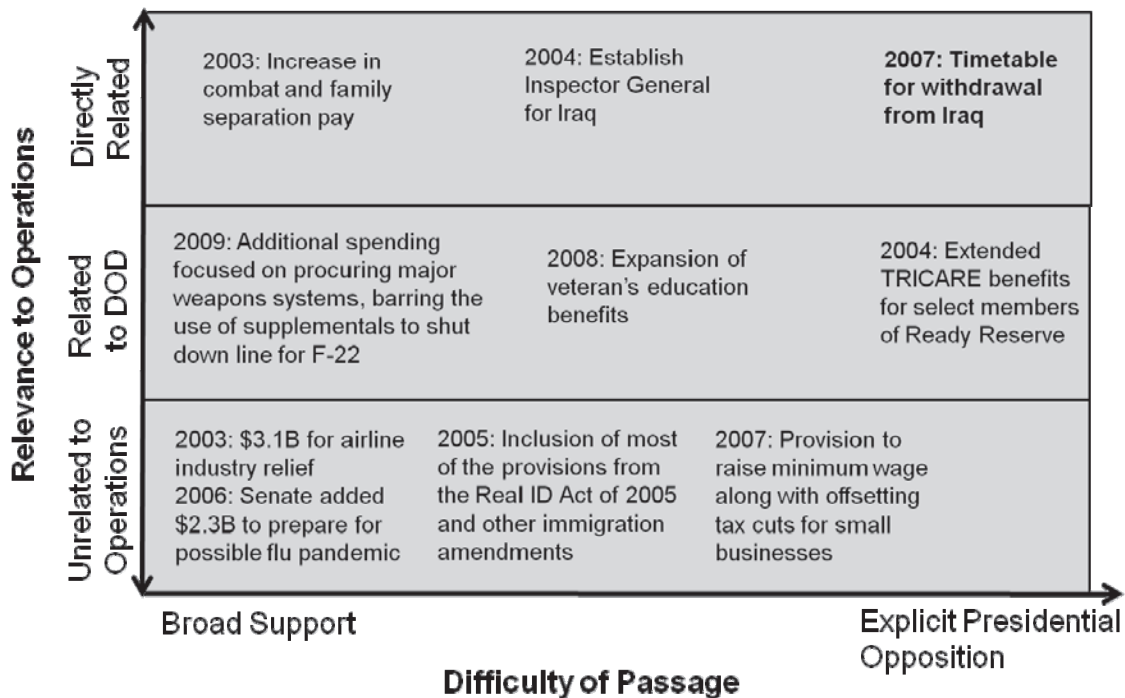
Hypothesis 6 predicts that supplemental appropriations bills should serve as a vehicle for introducing substantive legislation and additional appropriations that may be unrelated to wartime efforts. Others have described the Congressional use of supplemental appropriations bills to earmark funds for specific uses.⁷¹ However, the prediction of this hypothesis goes beyond earmarks; instead it anticipates that the urgent and important nature of wartime supplemental appropriations exacerbates this problem because the president is unlikely to veto a supplemental unless it constrains his strategy for executing the war. The analysis of additional legislation and appropriations added to the supplementals examines variation across two dimensions, relevance to operations and difficulty of passage. Figure 3.2 highlights how several provisions added to supplementals by Congress vary across these dimensions.

The purpose of Congressional changes and additions to supplemental appropriations bills ranged widely, including provisions that directly related to operations, such as incremental payments during deployments, as well as items that were clearly not related to operations, such as

⁷¹ Schick, 2007, 259; and Schatz, Thomas, "Pork Goes to War," *New York Times*, March 30, 2007.

immigration and minimum wage policy. Supplemental appropriations bills provided Congress with an instrument to influence war policy, the defense program, and other politically important issues. Congressional additions often led to future supplemental requests in a given area or followed from the previous year's requests. For example, in 2002 the administration requested and received additional funding for the airline industry, which was reeling from the 2001 terrorist attacks, and Congress continued funding the airline industry the next year, appropriating \$3.1 billion in further aid.

Figure 3.2
Congressional Additions to Supplemental Appropriations



Not only did supplemental appropriations provide a mechanism for adding provisions, they allowed passage of some contentious legislation that faced a veto threat from the president, struggled to pass alone or as a part of other legislation, or stalled in the Senate. One of the most controversial policy provisions introduced was an amendment to the 2004 supplemental that expanded the opportunity for members of the

reserve forces to receive TRICARE healthcare benefits if they did not have other health insurance. A similar amendment was originally introduced as part of the 2004 NDAA, but the president threatened a veto if the NDAA included it.⁷² Interviewees indicated that some members of Congress and senior leaders in the military's Reserve Components wanted to expand healthcare benefits for reservists as an additional recruitment incentive. However, members of the administration felt that this would not be an efficient personnel policy and wanted to focus on recruiting and retention tools like cash bonuses. Nevertheless, Senators Daschle and Graham introduced the amendment as part of the 2004 supplemental and the president did not veto it.

Congress included other provisions in supplemental appropriations bills that struggled to pass either alone or as part of other legislation. The 2008 wartime supplemental appropriations bill included a provision that enhanced education benefits, based largely on the Post-9/11 Veterans Educational Assistance Act of 2008, which had "broad bipartisan support, with 56 co-sponsors in the Senate" and "261 cosponsors" in the House for a similar bill.⁷³ However, the bill had been criticized as too costly, with final estimated costs at "\$63.8 billion from FY2008 through FY2018," and as having the potential for negative impact on service member retention.⁷⁴ One interviewee explained that the costs of the bill would have likely precluded passage if it had been included in the authorization act. Nevertheless, the president was unwilling to veto the supplemental appropriations bill with the education benefits attached.

Other provisions attached to wartime supplemental appropriations bills also faced political opposition to passage. Daggett (2007)

⁷² Daggett, Stephen et al., *FY2004 Supplemental Appropriations for Iraq, Afghanistan, and the Global War on Terrorism: Military Operations and Reconstruction Assistance*, CRS Report RL32090, Washington, DC: Congressional Research Service, November 13, 2003, 12.

⁷³ Daggett, Stephen, et.al. *FY2008 Spring Supplemental Appropriations and FY2009 Bridge Appropriations for Military Operations, International Affairs, and Other Purposes*, CRS Report RL34451, Washington, DC: Congressional Research Service, July 15, 2008, 41.

⁷⁴ Ibid., 42-43.

explained that "supplemental appropriations bills often include policy measures that are attached in order to bypass procedural hurdles, particularly in the Senate, that may be delaying progress through the regular legislative process."⁷⁵ Several individuals interviewed for this analysis noted that while Congress may delay the passage of wartime appropriations, few are going to vote against providing the requisite resources to execute operations. Therefore, these bills become an instrument to pass some difficult legislation proposed by members of both political parties. For example, many of the elements of the Real ID Act of 2005, which had passed only in the House, were later added to the wartime supplemental appropriations bill for 2005. In 2007, Congress added policy provisions to the wartime supplemental that increased the minimum wage with some offsetting tax cuts for small businesses. Thus, both members of Congress and the president may accept some provisions that they view unfavorably in order to pass wartime appropriations.

The examples above highlight that Congress added many different provisions to supplemental appropriations bills that would not likely pass by themselves or as parts of other bills. These provisions were difficult to pass because they were expensive, lacked support to move through all of the legislative procedural challenges, or the president strongly opposed them. The president used his veto power only once during this period, when a supplemental appropriations bill passed through Congress included a timetable for withdrawal from Iraq. In that situation, the bill would have greatly constrained the president's ability to execute the strategy he had selected, making the uncertainty about what might be included in a subsequent bill more desirable than what was offered. The examples of the president's willingness to use the veto only when it limited the execution of his plans while accepting expanding TRICARE for reservists even though he threatened to veto the NDAA for the same reason appears to follow the model predictions that the president's veto power is weakened when seeking wartime supplemental appropriations.

⁷⁵ Daggett et. al., 2007, 80.

CONCLUSIONS

The federal government used supplemental appropriations as the primary instrument for funding military operations from 2001 through 2009. The size and scope of these supplemental appropriations are unprecedented, as the source of funding for protracted wars in the past moved to the base budget "as soon as even a limited and partial projection of costs could be made."⁷⁶ Applied to wartime funding, the supplemental appropriations process weakened the normal checks among the various participants in the government. The president accepted changes and additional legislation included in the supplemental appropriations bills while Congress accepted reduced oversight of appropriations and activities. The supplemental appropriations process allowed these outcomes because it takes place outside the federal government's normal budgetary process.

From 2001 through 2009, the president submitted requests for supplemental appropriations during the ongoing fiscal year in each year except 2008. In 2008, an initial wartime funding request was included as an amendment to the annual budget submission for that year in February 2007; this request was updated in August and October 2007. The resulting 2008 wartime supplemental appropriations bill passed in June 2008. Overall, the supplemental appropriations process provided the opportunity for the DOD to revisit its annual budget during the year of execution.⁷⁷ The ability to revisit previous budgetary decisions and requests was used to provide the annual resources needed to pay for varying deployment levels in two major theaters of operations while developing and acquiring some new equipment specifically suited for unique theater needs.

⁷⁶ Daggett, Stephen, 2006, 2.

⁷⁷ Several respondents interviewed in the course of this study held very different views on whether the ability to reconsider defense budgetary decisions was appropriate. On one hand, this opportunity affords the DOD a chance to redress things that may be going poorly during the course of the year while on the other it creates an opportunity to expand defense spending with less scrutiny than the normal budget faces.

As the supplementals provided an opportunity to reconsider previous budgetary decisions, their use over an extended period of time reduced the resource tradeoffs that the DOD and Congress typically face due to the augmentation and reimbursement of base programs in supplemental appropriations bills. Acquisition programs funded using supplementals provided a way for the DOD to field new equipment, some of it to meet unique theater specific needs, without trading this funding against plans for force development and modernization. Furthermore, Congress used supplementals to provide additional resources for otherwise unfunded priorities that the DOD had not included in its annual budget. This pushed potentially difficult fiscal decisions into the future; one interview respondent exclaimed this further "aggravates the degree of fiscal irresponsibility that we have continued to see for a long time."

The inclusion of both war and base items in the supplemental appropriations confounded the nation's overall defense program with the costs of the war, which can have negative and potentially lasting consequences. One outcome from the extended use of supplementals was that the total appropriations for recent military operations were higher than necessary for the chosen wartime strategy. Furthermore, the outcomes from the supplemental appropriations process potentially expand current and future claims on the annual defense budget. The next three chapters examine the influence wartime appropriations have on the base defense program.

4. HOW SUPPLEMENTAL APPROPRIATIONS IMPACTED BASE PERSONNEL POLICY

Discussions of military and foreign policy often mention the high costs of recent military operations in Iraq and Afghanistan. However, these discussions rarely mention the longer term implications for the defense program and the DOD's annual budget resulting from these operations and the way the U.S. government paid for them. The enduring costs of military operations are important because the DOD budget typically contracts in post-conflict environments and will likely do so again when U.S. forces withdraw from Iraq and Afghanistan in large numbers. The previous chapter described how the DOD and Congress used supplemental appropriations to initiate some new programs and policies. This chapter examines how changes to personnel policy in supplemental appropriations impact the annual defense budget.

This chapter details three cases where new personnel policy was introduced in supplemental appropriations bills. The three cases analyzed under the military personnel title are the overall growth of the Army and Marine Corps, the increase of payments and allowances for deployed service members, and the expansion of life insurance and related survivor benefits. These personnel policy changes emerged in vastly different ways with a variety of future implications. Two of the provisions examined in this chapter focus on increases in benefits for military personnel. These changes will be long lived as the DOD and Congress would not likely reduce these benefits in the future due to concerns about recruiting and retention and because military personnel and retirees likely view those benefits as permanent entitlements.

EXPANSION OF THE ARMY AND MARINE CORPS

During the conduct of recent operations, the end strength of the Army and Marine Corps increased incrementally over several years. From 2002 to 2005 both the Army and Marine Corps grew by 2,400 service members each, but the pace of growth began to pick up in 2006. Since 2004, the DOD included funding for additional personnel in its wartime appropriations requests. Table 4.1 highlights the annual end strength

projections from the president's budget, submitted in February of the previous year, along with the number of additional personnel included in the requests for wartime funds.

Table 4.1
Requested Active Duty End Strength by Appropriations Source

Year	Army		Marine Corps	
	Base	Wartime	Base	Wartime
2003	480,000	0	172,600	0
2004	480,000	19,500	175,000	2,500
2005	482,400	10,500	175,000	5,000
2006	482,400	23,000	175,000	5,500
2007	482,400	39,500	175,000	11,500
2008	525,400	41,900	184,000	9,500
2009	532,400	15,000	189,000	8,100
2010	547,400	19,000	202,100	0
2011	569,400	22,000	202,100	0

Sources: President's Budget Submission and DOD and Presidential Requests for Supplemental/OCO Funding; Over Strength are estimates of how many additional personnel DOD supported through supplemental appropriations except 2011 where 22,000 is included in OCO request. 2008 estimate adjusted to reflect amended supplemental request in October 2007.

The DOD began requesting supplemental appropriations to pay for additional personnel above the normal strength level in 2004 with a request for \$2.5 billion for "military personnel on active duty above the normal strength levels and affected by military stop loss programs."⁷⁸ Interviewees revealed that these requests were initially included only in supplementals in order to ensure that they would not become permanent. This also ensured that their longer-term costs would not have to be recognized in the out-years of successive Future Years Defense Programs. DOD leadership concluded that while the Army and Marine Corps needed additional end strength while operations persisted,

⁷⁸ U.S. Department of Defense, *FY2004 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Noble Eagle*, Washington, DC: Department of Defense, September 2003, 11.

the services did not need them beyond these operations. Thus, they determined that it was appropriate to leave the growth in end strength that was necessary for current operations out of the annual budget.

However, from 2006 through 2011, the Army's permanent force structure grew by 65,000 soldiers while the Marine Corps added 27,100 marines. Several respondents mentioned that the impetus for the recognition of permanent growth in the Army and Marine Corps came from within the services themselves as well as Congress. Thus, the resulting permanent growth in end strength in the base defense program was an unexpected and undesired policy change from the perspective of some in the OSD.

While it is difficult to attribute specific portions of the growth in the Army and Marine Corps to supplemental appropriations, these policy changes were first introduced through the supplementals, and over time became accepted as part of the annual budget. These changes are also very expensive and influence multiple titles in the base defense budget. The growth in Army personnel increases the annual budget by about \$5.9 billion in the military personnel title and \$1.6 billion in the O&M title. Meanwhile these changes increase the Marine Corps personnel budget by about \$2.4 billion and O&M by \$.7 billion.⁷⁹

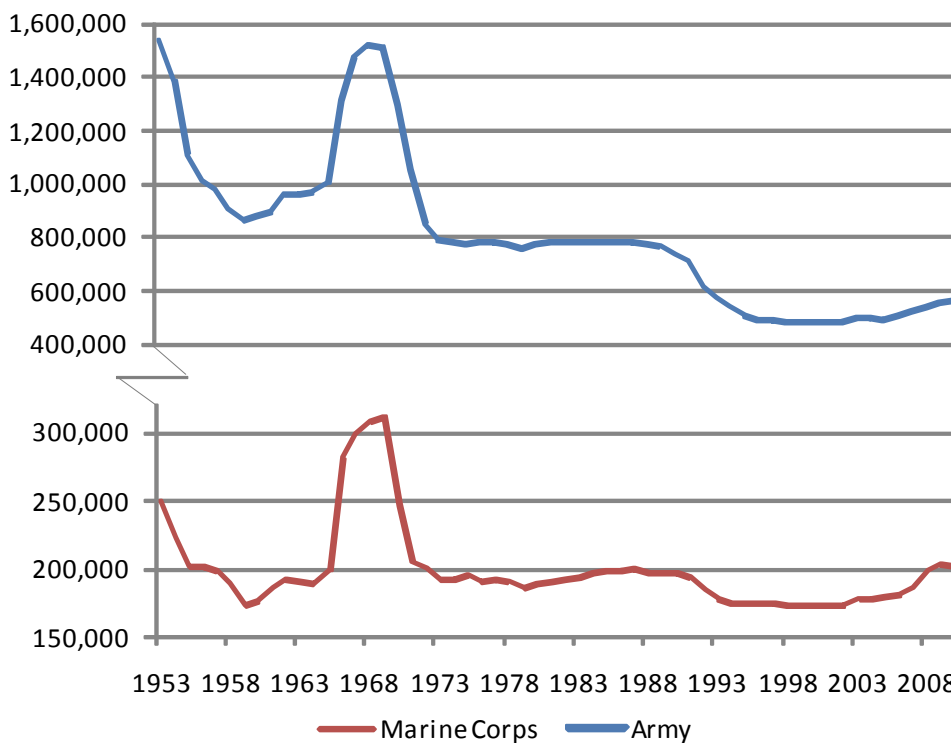
Increasing the end strength in the Army and Marine Corps is an expensive policy change, but is not one that is likely going to be difficult to adjust in the future. Total end strength for the Army and Marine Corps fluctuates annually due to base defense plans as well as recruiting and retention issues. Figure 4.1 highlights how end strength changed for the Army and Marine Corps since 1953.

The figure shows three periods where the total end strength decreased significantly corresponding to the end of the Korean and Vietnam Wars as well as the end of the Cold War in the 1990s. The growth in the Army and Marine Corps for recent operations was not extremely large and potential reductions in the force size as deployment demands

⁷⁹ These costs are in constant 2011 dollars. These estimates were developed using data from the Army Military-Civilian Cost System.

decrease may not be as large, relative to total force size, as past contractions. Secretary of Defense Robert Gates (2011) explained that the DOD is planning to “begin reducing Army active duty end strength by 27,000 and the Marine Corps by somewhere between 15,000 and 20,000” in 2015 based on the expectation that deployments to Afghanistan will be much smaller by 2014.⁸⁰

Figure 4.1
Army and Marine Corps End Strength



Source: Data collected on Military Personnel Statistics from the DOD Statistical Information Analysis Division

The overall growth in the Army and Marine Corps since 2003 was a result of increasing deployment needs during OEF and OIF. Recognizing that increasing overall end strength is very expensive, the DOD introduced growth in the supplemental appropriations requests to ensure

⁸⁰ Gates, Robert M., *Speech: Opening Summary -- Senate Armed Services Committee (Budget Request)*, February 17, 2011, Accessed April 4, 2011 at: <http://www.defense.gov/speeches/speech.aspx?speechid=1537>.

that this growth would not be seen as permanent. However, this policy also had implications for the federal government's deficit projections. Except for 2008, from 2002 through 2009 supplemental appropriations were requested after the beginning of the fiscal year, allowing the administration to leave this portion of the defense budget out of its annual deficit projections. In this case, the DOD's careful planning led to charges that the administration was hiding war costs and reducing congressional oversight of the overall defense program.⁸¹

In conclusion, the growth in end strength for the Army and Marine Corps was an expensive policy change largely introduced through supplemental appropriations requests. While not expected to be viewed as a permanent policy change, the growth eventually migrated into the base budget. This case represents a policy change that was intended to be temporary but resulted in something more permanent. However, based on historical end strength fluctuations, it appears likely that over time this policy will shift based on the dynamic demands for military forces.

INCREMENTAL DEPLOYMENT PAYS AND ALLOWANCES

When service members deploy, they receive additional income from special payments and allowances related to the hardships of military deployments. In April 2003, during the Senate debate on the supplemental appropriations bill Senators Ted Stevens and Richard Durbin introduced an amendment to increase these payments for deployed service members. Introducing the amendment, Senator Durbin noted that "there is no amount of money that we can give these men and women, nor their families, to compensate them for what they are giving to our country."⁸² The Senate agreed to the amendment, which increased the rate of IDP from \$150 to \$225 per month and the FSA from \$100 to \$250 per month retroactive to the beginning of the fiscal year and lasting through the end of 2003, by

⁸¹ Jones and McCaffery, 309 - 311.

⁸² Durbin, Richard, "Supplemental Appropriations Act to Support Department of Defense Operations In Iraq For Fiscal Year 2003," *Congressional Record 108th Congress (2003-2004)*, April 2, 2003, Accessed April 4, 2011 at: <http://www.thomas.gov/cgi-in/query/D?r108:3:./temp/~r1086eiELD:>

unanimous consent. The amendment was attached to the final supplemental appropriations bill signed by the president on April 16, 2003.⁸³ This policy change was expected to cost about \$650 million before expiring at the end of 2003.⁸⁴

The following September, the DOD submitted a request for supplemental appropriations for 2004 that included the extension of these additional payments while potentially expanding the pool of service members eligible for the full benefit. The DOD's proposal noted that the increase in IDP and FSA would expire at the end of the year and requested that this benefit be extended and altered so that all deployed service members would receive the full increase in payments. The requested change noted that the DOD planned to "begin paying an additional \$225 per month" in Hardship Duty Pay (HDP) instead of the increases in IDP and FSA because "special pays should be normalized for all in combat, regardless of marital or dependency status."⁸⁵ Changing the additional \$225 per month benefit to HDP would increase the number of service members deployed to combat areas eligible for the pay increase, but "troops not actually deployed 'in a combat zone' would receive less."⁸⁶ Congress rejected changes proposed by the DOD and simply extended the benefits for another year in the 2004 supplemental appropriations bill.

Congress addressed these benefits again in the 2005 NDAA, where they permanently codified increases to IDP and FSA.⁸⁷ These benefits

⁸³ U.S. Congress, *Making Emergency Wartime Supplemental Appropriations for the Fiscal Year 2003, and for Other Purposes*, P.L. 108-11, Sec. 1316, 2003.

⁸⁴ Belasco, Amy and Larry Nowels, *Supplemental Appropriations FY2003: Iraq Conflict, Afghanistan, Global War on Terrorism, and Homeland Security*, CRS Report RL31829, Washington, DC: Congressional Research Service, May 5, 2003, 4.

⁸⁵ U.S. Department of Defense, *FY2004 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Noble Eagle*, Washington, DC: Department of Defense, September 2003, 10. Emphasis in original document.

⁸⁶ Daggett et al., 2003, 36.

⁸⁷ U.S. Congress, *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005*, P.L. 108-375, Sec. 623, "Permanent Increases

changes increased the overall costs of deploying service members during recent operations. Table 4.2 highlights how the costs of deploying service members increased since 2003 as well as the overall estimated costs from increasing incremental deployment pays and allowances. The total costs vary each year based on the estimated number of deployed service members per month.

Table 4.2
Annual Costs of Increases in IDP and FSA (All Current Dollars)

Monthly Incremental Deployment Costs				Before Policy (2003)		After Policy (2003)	
With Dependents		Officer	517		742 (+44%)		
		Enlisted	604		829 (+37%)		
Without Dependents		Officer	417		492 (+18%)		
		Enlisted	504		579 (+15%)		
Total Costs (\$ millions)							
2003	2004	2005	2006	2007	2008	2009	2010
330	507	477	476	505	522	519	502

Sources: Estimates calculated from pay data collected from Defense Finance and Accounting Service Military Pay Tables; Data on deployments through November 2008 - Belasco, Amy, *Troop Levels in the Afghan and Iraq Wars, FY2001-FY2012: Cost and Other Potential Issues*, CRS Report R40682, Washington D.C.: Congressional Research Service, July 2, 2009; Data on deployments since September 2008 DOD, Statistical Information and Analysis Division, "Military Personnel Reports," Publish Quarterly, December 2008 - September 2010.

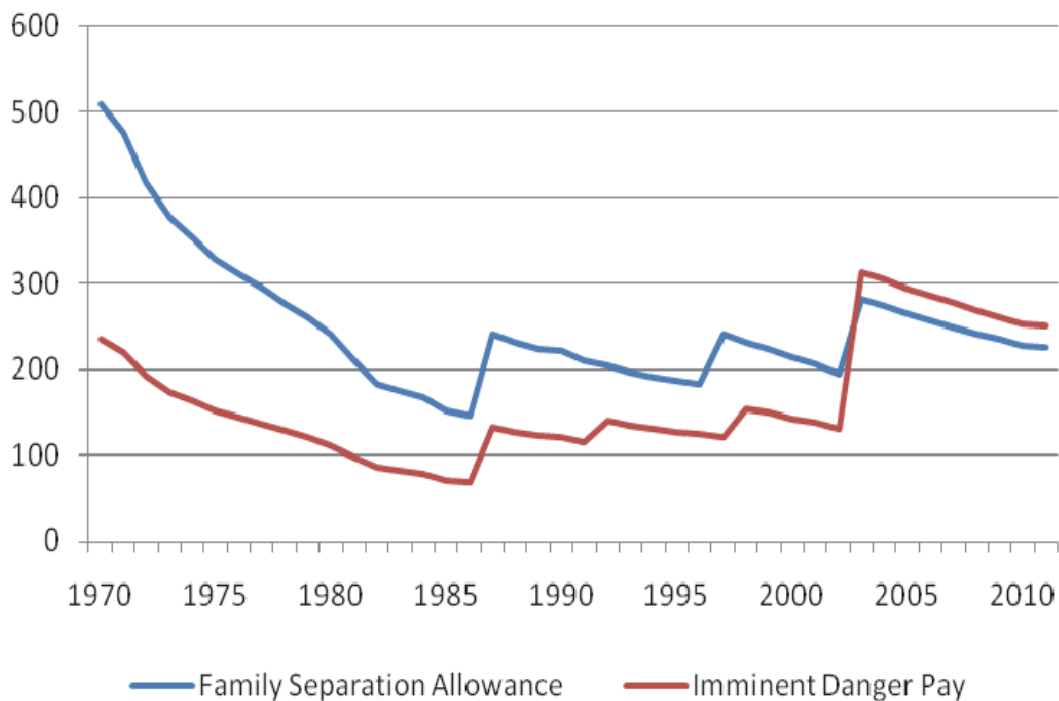
There are several important implications of the increases in IDP and FSA in 2003. This was an unrequested policy change initiated by Congress to highlight their support for deployed service members. Though introduced as a temporary measure in a supplemental appropriations bill, it migrated into the NDAA within a couple of years. When the DOD sought to change the policy, expanding incremental payments for some while potentially reducing those payments for others, Congress refused. This

in Authorized Amounts for Imminent Danger Special Pay and Family Separation Allowance," 2005.

indicates the potential difficulty in altering a policy that may reduce payments for some service members.

This policy is also long lived since the increases in IDP and FSA were made permanent. However, it only affects service members during deployments so the costs do not necessarily accrue annually in the base budget. Furthermore, unless the policy is periodically updated inflation will moderate its future effects. Historically, Congress and the DOD rarely update the rates of these payments and allowances; since 1958 IDP, formerly called Hostile Fire Pay, was updated just three times while FSA was updated four times. Figure 4.2 displays the payment rates for IDP and FSA controlling for inflation.

Figure 4.2
Monthly Rates for IDP and FSA since 1970 (2011 \$)



Source: Data collected from Defense Finance and Accounting System Military Pay Tables from 1970 - 2010.

Figure 4.2 highlights how the value of these payments erodes over time when not updated. Hostile Fire Pay remained \$65 per month from 1958 until 1986, during which time the value of this benefit greatly

diminished. Controlling for inflation the average value of IDP since 1970 was about \$251 per month while FSA was about \$161 per month. Since 2003, the real value of IDP and FSA has declined by about 19 percent. If Congress wishes to maintain the value of these deployment benefits, then it should regularly adjust these benefits or index them to some measure of inflation.

LIFE INSURANCE, DEATH GRATUITIES, AND TRAUMATIC INJURY COVERAGE

In 2005, the wartime supplemental appropriations bill included several provisions that expanded some military death and injury benefits. The DOD's request for supplemental appropriations that year included provisions to increase the maximum amount of life insurance available under the SGLI program from \$250,000 to \$400,000 and raise the death gratuity provided to survivors of service members killed while serving during operations from \$12,420 to \$100,000.⁸⁸ Congress provided both of these changes while adding three other provisions that gave service members traumatic injury coverage of up to \$100,000, extended the time the DOD provides service members' survivors housing allowance from six to twelve months, and granted funds to allow family members to travel to visit hospitalized service members.⁸⁹

The introduction of these changes to personnel benefits by both the DOD and Congress resulted from concerns that survivors of military service members needed better financial protection. Senator Jeff Sessions led much of this effort in Congress after "a soldier from

⁸⁸ SGLI provides service members with term life insurance in increments of \$50,000 for a monthly premium. As of November 30, 2010 SGLI premiums are \$3.25 per increment per month. The monthly cost of the \$400,000 maximum coverage is \$26.00. U.S. Department of Veterans Affairs, "Service Members' and Veterans' Group Life Insurance," November 30, 2010, Accessed August 3, 2011 at: <http://www.insurance.va.gov/sglisite/sgli/sgliFaq.htm#10>

⁸⁹ U.S. Congress, *Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Tsunami Relief, 2005*, P.L. 109-13, Sec. 1012, 1013, 1026, and 1032, May 11, 2005.

Alabama who had turned down SGLI was among the first killed in Iraq.”⁹⁰ The 2004 NDAA directed the DOD to conduct a study to “assess the adequacy” of all death and survivor benefits.⁹¹ This requirement resulted in reports by the GAO and the SAG Corporation. Both of these studies reached similar conclusions.

The GAO assessed the extent to which military survivor benefits differ from other government employees as well as how government agencies enhance those benefits for individuals serving in “high-risk occupations.”⁹² The GAO (2004) noted that the types of benefits are comparable; further, survivors of military service members almost always receive more lump sum payments, often receive more recurring payments, and generally receive more types of nonmonetary benefits than other government employees.⁹³ However, government employees in high-risk occupations often receive supplemental benefits that are “generally higher than those for survivors of service members” in the military.⁹⁴ The SAG Corporation found that the “benefits provided to survivors of members who die on active duty to be adequate, substantial, and comprehensive” and recommended adding \$50,000 of life insurance coverage at no cost to service members.⁹⁵

In a briefing to Congress, Under Secretary of Defense (Personnel and Readiness) David Chu (2005) noted that the DOD agreed with the findings of the SAG and GAO reports. He also stated that the DOD supported the “principle that the surviving family of a member killed in combat should receive about \$500,000” with “\$150,000 of insurance funded

⁹⁰ Philpott, Tom, “Military Update: Benefits Could Increase for Survivors of Troops Killed in Iraq, Afghanistan,” *Stars and Stripes*, January 16, 2005.

⁹¹ U.S. Congress, *National Defense Authorization Act for Fiscal Year 2004*, P.L. 108-136, Sec. 647, 2003.

⁹² U.S. Government Accountability Office, *Military Personnel: Survivor Benefits for Servicemembers and Federal, State, and City Government Employees*, GAO-04-814, Washington, DC: GAO, July 2004, 2.

⁹³ Ibid., 4.

⁹⁴ Ibid., 5.

⁹⁵ Mackin, Patrick, Richard Parodi, and Mark Dye, *Review of Military Death Benefits Final Report*, Annandale, VA: SAG Corporation, April 20, 2004, 46.

by the government when the member is serving in an operation.”⁹⁶ The DOD’s request for wartime supplemental appropriations submitted that month then included a request for \$400 million to pay for these provisions along with a request that “an incremental survivor benefit totaling \$238,000 (\$150,000 SGLI and \$88,000 death gratuities) would be paid retroactively for all deaths that occurred” during military operations since 2001.⁹⁷

President Bush signed the wartime supplemental appropriations bill in May 2005 enacting these changes but increases in SGLI and the death gratuity were only effective through the end of the fiscal year. In September 2005, Congress passed a bill that permanently increased SGLI to \$400,000 and required spousal notification if a married service member opted out of SGLI.⁹⁸ Subsequently, the 2006 NDAA permanently increased the death gratuity to \$100,000.⁹⁹

The introduction of these policy changes in supplemental appropriations may appear out of place since many months of analytic and political effort went into their formation, and supplemental appropriations typically provide resources to meet unforeseen challenges that arise during the year. Interviewees for this study noted that the DOD introduced these policy changes first in the supplemental in February 2005 to ensure they would be quickly enacted. Supplemental appropriations were requested in February and passed four months later in May. If these policies had been requested as part of the annual budget and introduced first in the NDAA for 2006, they would not have taken effect until about 12 months later. Thus, using the supplemental

⁹⁶ Chu, David S.C., Prepared Statement Before the Senate Armed Services Committee, *Caring for the Severely Wounded and the Families of Deceased Military Personnel*, February 1, 2005.

⁹⁷ U.S. Department of Defense, *FY2005 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Unified Assistance*, Washington, DC: Department of Defense, February 2005, 3-4.

⁹⁸ U.S. Congress, *Servicemembers’ Group Life Insurance Enhancement Act of 2005*, P.L. 109-80, September 30, 2005.

⁹⁹ U.S. Congress, *National Defense Authorization Act for Fiscal Year 2006*, P.L. 109-163, Sec. 664, January 6, 2006,

appropriations bill to introduce this legislation provided a convenient instrument for the DOD to provide these benefits sooner than going through the normal authorization process.

The costs of these new benefits quickly migrated into the base DOD budget as they became permanent policy within a year of their introduction. From 2005 to 2008, the cost of survivor benefits in the annual DOD budget rose by about \$62 per active duty service member per year or about 230 percent in real terms.¹⁰⁰ For a total force with about 1.41 million active duty service members, this raises the total military personnel cost by about \$87 million per year. In addition, wartime budgets included large appropriations to cover the costs of paying some of these additional benefits. Since 2005, wartime spending included about \$5.3 billion for survivor benefits.

Finally, like the incremental deployment benefits described above, survivor benefits are not indexed to inflation and the DOD and Congress have not addressed the overall value of survivor benefits since they were increased in 2005. From 2005 to 2010, the real value of these benefits diminished by about 14 percent. One of the recommendations from the SAG Corporation's report on survivor benefits in 2004 was that these benefits should be indexed using "the annual average increase in Basic Pay."¹⁰¹ If the DOD and Congress wish to ensure that these benefits have a stable value, then they should follow this recommendation or index these benefits to another measure of inflation.

CONCLUSIONS

The cases presented in this chapter describe how personnel policy changes were introduced in supplemental appropriations along with their lasting consequences. The personnel policy changes included in these cases carried a wide range of costs when made permanent. One presented additional costs only when forces are deployed while another introduced

¹⁰⁰ Budget cost estimates in this section are based on data collected from annual DOD Military Personnel Programs (M-1) budget submissions.

¹⁰¹ Mackin et al., v.

billions of dollars of additional costs in the annual budget across multiple budgetary titles. Several important conclusions emerge from examining the longer term implications for the base defense budget from the use of supplemental appropriations to fund protracted operations.

The first conclusion is that each of the policies described had strong political backing. Congress introduced increases in incremental deployment pay and allowances, expanded on the DOD's proposed survivor benefits, and pressured the DOD to recognize permanent increases in end strength for the Army and Marine Corps. The statements made by those introducing the increases in deployment payments and the unanimous vote in the Senate for their passage shows evidence of the political importance of increasing service members' benefits in a time of war. However, these benefits did not receive attention every year, and the value of some of these benefits has diminished since they were not indexed to inflation.

Another important result is that wartime budgets were used to introduce large costs into the annual defense program. While the DOD may manage a reduction in end strength following military operations, the growth of the Army and Marine Corps introduced new claims in the annual program that may require trades in other areas. Adams (2007) explained that, should the forces of the Army and Marine Corps not decline, "there will need to be bill payers to pay for the ground forces," which "could well be the other services, with particular harsh consequences for their long-term investments in new platforms and technologies."¹⁰² Thus, the additional costs from the expansion of the Army and Marine Corps may compete with new and important military capabilities within the overall defense program in the future.

Congress quickly made the personnel policy changes permanent, especially those related to military benefits, by including them in subsequent authorization bills or by passing additional legislation. Thus, the longer term effects of personnel policy changes introduced in

¹⁰² Adams, Gordon, "Budgeting for Iraq and the GWOT," Testimony before the Committee on the Budget, United States Senate, February 7, 2007.

supplementals were quickly realized in the annual defense budget. Once passed, there is little support for seeing the benefits reduced due to time restrictions. Benefits changes prove to be very long lived though the overall impact may diminish over time if they are not indexed to inflation.

That these policy changes were quickly made permanent may indicate that some of these changes would likely have taken place anyway but were included in the supplemental to speed their passage. Interviewees suggested that supplemental appropriations bills provided a convenient vehicle for ensuring quick passage of personnel policy changes. In this way, the DOD viewed its supplemental request not simply as a means of paying for current military operations but as an opportunity to revisit budgetary issues during the course of the year.

Finally, the personnel policy changes introduced in supplemental appropriations were not always requested or anticipated by the DOD leadership. This was true for the increase of incremental deployment pays and allowances as well as the growth in end strength, which the DOD included in its supplemental requests with the intention that the change would not become permanent. The supplemental appropriations process thus served as an opportunity for both the DOD and Congress to introduce new personnel policy measures.

5. WARTIME BUDGETS INFLUENCE OPERATION AND MAINTENANCE SPENDING

About 60 percent of the resources provided through wartime appropriations were directed to the O&M title. The DOD used O&M resources to fund many different defense activities related to overseas military operations including the costs of deploying personnel and equipment, operating and maintaining equipment overseas and contracting services. In the annual budget, this title covers costs for training, operating, and maintaining military forces, and it is also used to fund other activities including the Defense Health Program, drug interdiction, and environmental restoration. There are two cases discussed in this chapter; the first examines the expansion of health benefits provided to service members in the Reserve Components while the other describes how some O&M costs will likely transfer from wartime budgets into the annual budget.

TRICARE RESERVE SELECT

In September 2003, the president signed a supplemental appropriations bill for military operations that also included a policy provision expanding the healthcare benefits that certain service members in the Reserve Components were eligible to receive. A healthcare provision similar to the one passed in the supplemental appropriations bill was simultaneously being considered in the NDAA. These expanded benefits were very contentious as President Bush threatened to veto the NDAA if it included a provision, already passed by the Senate that "offered health insurance to non-active duty reservists and their families through the DOD TRICARE program."¹⁰³

The supplemental appropriations bill included an amendment proposed by Senator Tom Daschle that allowed service members in the Reserve Components to enroll in TRICARE if unemployed or not eligible for healthcare benefits from an employer through September 30, 2004.¹⁰⁴ This

¹⁰³ Daggett et al., 2003, 12.

¹⁰⁴ U.S. Congress, P.L. 108-106, Sec. 1115, November 6, 2004.

provision led to the expanded healthcare benefits for reservists that became the TRICARE Reserve Select (TRS) program. Not long after the introduction of this program in the 2004 supplemental appropriations bill, the NDAA for 2004, signed in November 2003, extended the time frame for the benefits through December 31, 2004. Subsequent NDAA's continued to extend this program until the NDAA for 2007 made this provision permanent. TRS remains available for unemployed or otherwise uninsured reservists, but unlike other plans in the TRICARE system, TRS enrollees must pay 28 percent of the costs of coverage while the DOD pays the remaining share.

Similarly to the increase in survivor benefits, the expansion of reserve healthcare benefits quickly migrated from supplementals into the DOD base program. However, in this case the Congress took advantage of the urgency to pass war funding to introduce a program the administration did not want. When initially introducing an amendment to offer healthcare to reservists, Senators Graham and Clinton noted that it would "make joining the National Guard or the military reserves more attractive."¹⁰⁵ Hosek (2008) explained that members of Congress also expected that offering healthcare to reservists would ensure that these service members had access to good health coverage and improve "medical readiness of deploying reservists" in addition to enhancing recruiting and retention.¹⁰⁶

Interviews with officials in the executive branch revealed some of the reasons why the administration opposed offering TRICARE benefits to reservists. They felt that this new policy was inefficient, since younger people highly discount the value of benefits like health insurance. Thus, they believed that cash bonuses would provide better recruiting and retention tools. Additionally, many did not believe that

¹⁰⁵ Congressional Quarterly, *2005 CQ Almanac*, "Defense: Bush Signs Defense Authorization with Detainee Provision," Washington, DC: Congressional Quarterly Press, 2005, 6-3 - 6-9.

¹⁰⁶ Hosek, Susan D., "TRICARE Reserve Select: Would Extending Eligibility to All Reservists be Cost Effective?," In Winkler, John D. and Barbara A. Bicksler, *The New Guard and Reserve*, San Ramon, CA: Falcon Books, 2008, 198.

offering ongoing health insurance to reservists would improve medical readiness because there was little empirical evidence supporting these claims. Instead the administration preferred to offer healthcare benefits for a period of time leading up to deployment in order to enhance medical readiness. Finally, the administration also did not want to expand social programs and noted that this plan introduced a new program of government subsidized healthcare.

Offering new healthcare benefits to reservists carried the potential for significant new costs. The CBO (2003) initially estimated that offering healthcare benefits to all reservists, as originally proposed, would cost "\$466 million in 2004 and almost \$7.3 billion over the 2004 - 2008 period."¹⁰⁷ Congressional Quarterly noted that the 2004 cost of the benefits initially passed in the supplemental appropriations bill were expected to be "about \$400 million and affect about one-fifth of the National Guard and reserve members."¹⁰⁸

However, these estimates vastly overstated the actual cost of the program as fewer reservists signed up for TRS than initially expected. In December 2007, the GAO issued a report about the costs of the TRS program during 2005 and 2006. The GAO noted that:

While the department projected that its total costs would amount to about \$70 million in fiscal year 2005 and about \$442 million in fiscal year 2006, DOD's reported costs in those years were about \$5 million and about \$40 million respectively.¹⁰⁹

The GAO report explained that the DOD projected to have 23,951 reservists enroll for individual coverage and 90,235 for family coverage in 2007, but as of June 2007 only 3,487 individuals and 8,047 families

¹⁰⁷ Congressional Budget Office, *Cost Estimate: S.1050 National Defense Authorization Act for Fiscal Year 2004, As Passed by the Senate on May 22, 2003*, Washington, DC: Congressional Budget Office, June 2, 2003, 13.

¹⁰⁸ Congressional Quarterly, 2003, 2-83 - 2-86.

¹⁰⁹ U.S. Government Accountability Office, *Military Health: Cost Data Indicate That TRICARE Reserve Select Premiums Exceeded the Costs of Providing Program Benefits*, GAO-08-104, Washington, DC: Government Accountability Office, December 2007, 5.

were actually enrolled.¹¹⁰ At the time of the report, the DOD projected that enrollments would stabilize by about 2010 with about 107,000 enrolled and program costs reaching \$874 million by 2013.¹¹¹

TRS enrollment numbers increased every year from 2005 through 2010; Table 5.1 highlights the overall enrollment numbers. During this time the DOD also adjusted the premiums twice. When the program began in 2005 premiums for individuals were \$75 per month, while families paid \$233.¹¹² In 2007, the rates were adjusted to \$81 for individuals and \$253 for families, and in 2009 the rates decreased to \$47.51 for individuals and \$180.17 for families.¹¹³ The costs of TRS for the DOD also increased over this period. By 2011, the TRS funding baseline reached \$201M and was expected to grow by \$137M in 2012.¹¹⁴

Table 5.1
TRICARE Reserve Select Annual Enrollment

	2005	2006	2007	2008	2009	2010
Individual	1,376	3,706	3,576	11,695	17,862	23,949
Family	3,352	8,115	8,364	18,547	28,735	38,679
Total Lives Covered	13,800	33,934	35,074	79,348	120,769	160,995
Change in Total Plans		150%	1%	153%	54%	34%

Sources: U.S. Department of Defense, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year Report to Congress*, Washington D.C.: Department of Defense, FY2006, 2007, 2008, 2009, 2010, and 2011.

¹¹⁰ Ibid., 19.

¹¹¹ Ibid., 21.

¹¹² U.S. Department of Defense, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2006 Report to Congress*, Washington D.C.: Department of Defense, 2006, 9.

¹¹³ U.S. Department of Defense, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2008 Report to Congress*, Washington D.C.: Department of Defense, 2008, 9 and U.S. Department of Defense, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2010 Report to Congress*, Washington D.C.: Department of Defense, 2010, 11.

¹¹⁴ U.S. Department of Defense, *Defense Health Program: Fiscal Year (FY) 2012 Budget Estimates, Volume I: Justification of Estimates*, Washington, DC: Department of Defense, January 2011, 37.

The case of expanding health coverage provided to some members of the Reserve Components in some ways resembles the military personnel cases in the previous chapter. A supplemental appropriations bill was used to expand the provision of benefits focused on individual service members. Subsequent legislation also addressed the new benefit, first extending the time frame for TRS and eventually making it permanent. Additionally, the expanded benefits quickly moved to the annual DOD budget, increasing overall operating costs for the DOD.

However, this case is also unique. While there was bipartisan support within Congress for introducing new healthcare benefits for service members in the reserve components, there was strong opposition from the executive branch based on the potential costs of the program as well as concern that it was an inefficient recruiting and retention tool that would not significantly impact medical readiness. Hosek (2008) noted that through 2007 "the number of uninsured reservists has not significantly changed."¹¹⁵ In this case, the urgency of the supplemental appropriations process helped to overcome the expressed opposition to this policy from the administration.

Furthermore, the overall costs of the policy were uncertain and initially overestimated, but they grew over time and will continue to grow as both the numbers of enrollments and healthcare costs increase. Early on in the program, enrollment was far below projections so the costs were very low. However, reduced premiums helped increase enrollment and the costs of TRS increased. Other program changes may further increase enrollment rates; some members in Congress have expressed interest in expanding eligibility for TRS to all selected reservists.¹¹⁶ Such a policy change could induce migration from civilian employer health plans to TRS.

RESOURCE MIGRATIONS

Military operations always introduce new demands for O&M spending that are directly related to the conduct of those operations. As

¹¹⁵ Hosek, 218.

¹¹⁶ Ibid., 198.

described above, the federal government provided resources to cover these costs outside of the DOD's annual budget. However, some of the costs generated by recent operations may have tails that extend beyond the course of these operations with costs shifting into the annual budget. There are two primary ways that this may happen. First, the source of payments for some activities moved from the DOD's annual budget into the wartime budgets and will return as claims on the annual budget after operations conclude. Second, some new activities were introduced in the supplementals that the DOD and the military services may wish to continue beyond the operations.

Respondents interviewed for this analysis described the potential long term costs stemming from the conduct of the wars and the way the government financed them. One interviewee noted that the services sought to create "headroom" within their annual budgets by moving the costs of some activities into the wartime budgets. Another explained that the potential for this funding migration is the largest risk of using supplemental appropriations. This interviewee also noted that the DOD became reliant on supplemental appropriations "offloading" the costs of some annual activities into this additional funding, and mentioned they are now struggling to move items back into the base budget. Finally, another explained that one of the challenges from using supplemental appropriations for an extended period of time is that over time the services lose the understanding of the total O&M resources they need to conduct annual operations in peacetime. Interviewees also revealed that some potential sources for these cost migrations are depot maintenance, theater specific training, and base support activities.

Interview responses provided a starting place for an analysis of annual O&M requests from 2000 - 2011 and wartime O&M requests from 2004 - 2011 to further identify the potential areas where annual O&M costs may grow after operations in Iraq and Afghanistan conclude.¹¹⁷ Analysis

¹¹⁷ The range of years for this analysis was selected based on the availability of appropriate data. Examining annual O&M budgets from 2000 ensures that there are three years of annual budget data submitted before the attacks of 9/11. This serves as a basis for considering how

of the base and wartime budgets is necessary in order to identify activities where the resources for certain activities moved from the base into the wartime budgets.¹¹⁸ Activities where the DOD shifted funding from the base into the wartime budget would experience decline in the base budget when they were introduced and grew in the wartime budgets.

From 2000 through 2011, the annual O&M requests, adjusted for inflation, for the military services grew by about 49 percent. During this time the Marine Corps experienced the largest relative O&M increase, about 79 percent, the Army and Air Force's annual O&M budgets each grew by about 48 percent, and the Navy's O&M budget grew by 40 percent but remains larger than any of the other services. Such extensive growth in the annual operating budgets of the services may mask potential movements in funding from the base to the wartime budgets. Thus, the analysis considered activities where funding decreased in real terms or as a portion of the overall budget.

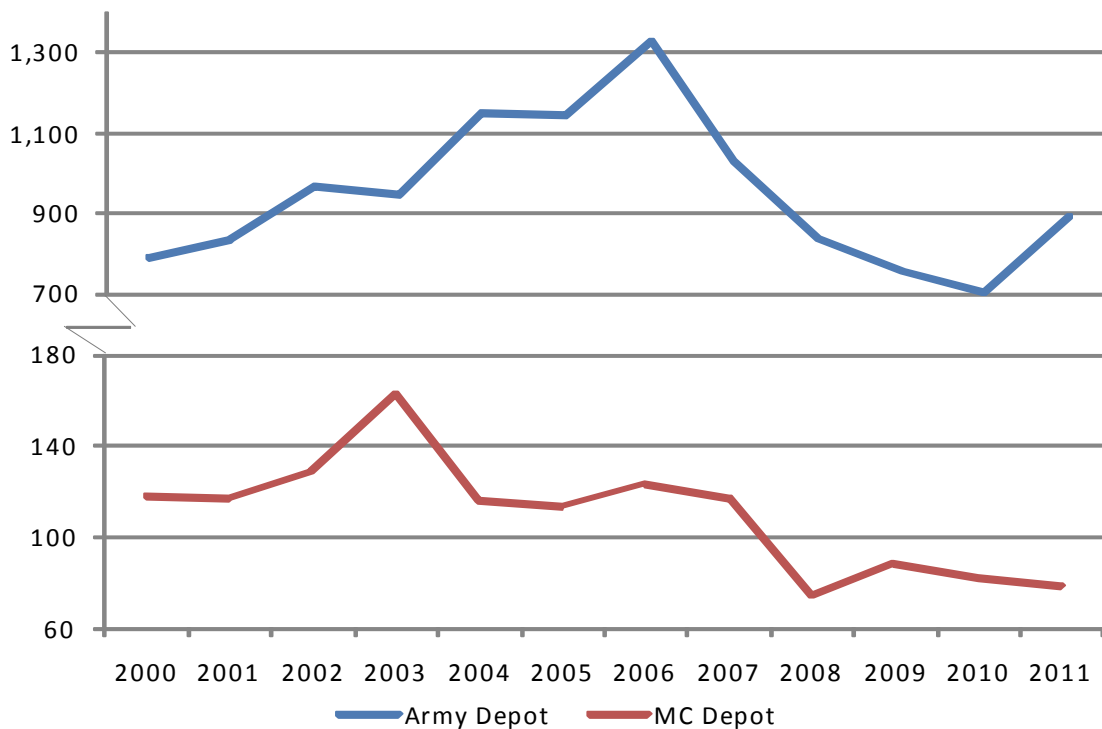
Interviews revealed that the depot maintenance budget stood out as a likely area where costs shifted from the base into the wartime budgets. Each of the services conducts depot level maintenance on major equipment, and each requested funding for it in their wartime requests. Evidence for migration of funding from the base into the wartime funding is greatest in the Army and Marine Corps, which received the largest relative amounts of additional maintenance funding in their wartime budgets. Figure 5.1 shows changes in the annual Army and Marine Corps depot maintenance budgets.

the DOD increased or reduced funding for certain activities. The supplemental requests for O&M resources from 2001 through 2005 were not very well detailed. However, there is some data on depot maintenance in the requests in 2004 and 2005, while subsequent requests provided more detail.

¹¹⁸ This analysis focused on the annual O&M Programs (O-1) data released by the DOD near the time of the President's budget submission. This analysis considered data for each of the services Budget Activity Titles, Activity Group Titles, and Sub-Activity Group (SAG) Titles. Individual services' budgets were used to collect additional information on items within specific SAG titles.

Over this period, both the Army and Marine Corps increased, and then decreased the amounts provided to their respective depot maintenance programs. In 2011, the Army once again increased the amount it budgeted for depot maintenance, but it remained 33 percent below its peak in 2006. In 2011 the Marine Corps' annual budget for depot maintenance was 33 percent less than in 2000, and less than half of what it budgeted for depot maintenance at its peak in 2003.

Figure 5.1
Army and MC Annual Depot Maintenance Requests (2011 \$ Millions)



Sources: Calculated from data collected in the DOD's annual Operation and Maintenance (O-1) requests.

The reduced requests for depot maintenance funding in the annual budgets came at a time when the Army and Marine Corps were heavily engaged in military operations and were including significant amounts of maintenance funding in their wartime funding requests. Table 5.2 highlights the services' wartime maintenance requests, comparing them to their annual requests for depot maintenance. In 2007 the Army introduced the reset program, which focused on replacing equipment lost or

destroyed in theater, repairing equipment at home station or at depots, and "recapitalizing systems" to as-new or upgraded condition.¹¹⁹ After 2006, the Army requested wartime maintenance funding for the reset program instead of the usual SAG for depot maintenance.

Table 5.2
Annual and Wartime Maintenance Requests (2011 \$ Millions)

Year	Army		Marine Corps	
	Base	War	Base	War
2000	788	0	118	0
2001	836	0	117	0
2002	966	0	128	0
2003	948	0	162	0
2004	1,151	1,222	116	71
2005	1,146	2,301	113	119
2006	1,330	5,070	123	401
2007	1,029	9,034	117	478
2008	835	8,132	74	509
2009	756	8,086	89	557
2010	702	7,979	82	663
2011	890	7,840	79	523

Sources and notes: DOD's annual O&M (O-1) requests and DOD's Requests for Supplemental Appropriations. 2005 includes only funding for depot maintenance. For the Army 2006 - 2011 includes all funding requested for the reset program, which became a separate SAG in 2007.

Wartime requests for depot maintenance and the reset program were significantly more than annual depot maintenance requests. This allowed the Army and Marine Corps to rapidly increase their depot maintenance activities. In 2008, the Army reported that depot maintenance "output levels have nearly doubled since 2003 levels and have not been this high

¹¹⁹ Congressional Budget Office, 2007, xiv-xv.

since the Vietnam War."¹²⁰ Analysis of the workload provided by depot maintenance facilities indicated that "the Army and Marine Corps increased their demands for depot work by a combined 144 percent" from 2001 to 2008.¹²¹ Some depot maintenance activities also moved overseas and focused on stocks of equipment that remained in theater during operations.¹²²

The reduced amounts requested in the annual budget along with large wartime funding requests indicate the migration of depot maintenance funding into the wartime budget. There are also some indications that this shift went beyond what was necessary for the repair of equipment used in military operations overseas. One interviewee, who worked in legislative branch, explained from 2005 to 2008, Congress began transitioning depot maintenance funding from the annual budget to supplementals. Another from the executive branch indicated that wartime depot maintenance requests were limited by the Comptroller based on how much the services could actually spend in ramping up their depot maintenance programs. Furthermore, the CBO (2007) reported that "a significant portion of the funds the Army says it requires for its reset program supports activities that, although beneficial to the Army, do not directly relate to replacing lost equipment or repairing worn or damaged systems."¹²³ As one interviewee noted, the Army's vehicle fleets are in better condition after years of war than they were prior to these operations.

Given the migration of funds from the annual budget into the wartime budget for depot maintenance, additional maintenance costs will likely shift back into the annual budget as overseas operations conclude and the services operate their equipment during peacetime training operations instead of in combat. Also, based on the high levels of

¹²⁰ U.S. Department of the Army, Deputy Chief of Staff - G-4, *Army Depot Maintenance Enterprise: Strategic Plan 2008 - 2025*, Washington, DC: Department of the Army, April 2008, 9.

¹²¹ Avdellas, Nicholas et al., *Future Capability of DOD Maintenance Depots*, Report LG901M2, McLean, VA: LMI, February 2011, 2-4.

¹²² Ibid., 2-5

¹²³ CBO, 2007, 33.

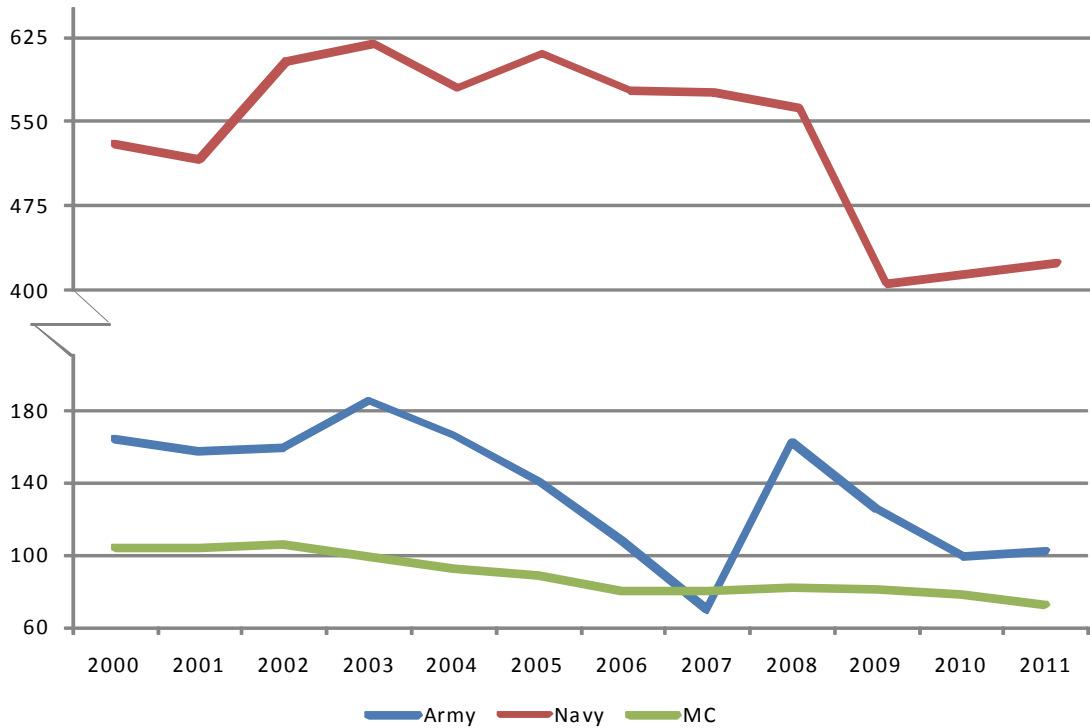
funding needed to repair equipment during operations, these additional costs may be substantial initially. The Army reported that it would need additional funding for reset for two years after operations in Iraq and Afghanistan end.¹²⁴ However, longer term depot maintenance spending should eventually be more in line with experiences prior to recent operations.¹²⁵ If depot maintenance costs in the Army and Marine Corps consumed the same portion of the base budget that they did from 2000 - 2002, this would add about \$285 to \$410 million to the annual Army budget and \$120 to \$130 million to the Marine Corps budget. The Air Force may also experience \$340 to \$490 million in additional depot maintenance cost as the wars conclude, but these potential shifts represent a smaller fraction of its overall depot maintenance program.

Other future O&M cost increases are associated with shifts from the annual budget to the wartime budget for activities that recent military operations curtailed in the annual budget. Prepositioned equipment used during operations provides the prime example of this type of activity. The Army, Marine Corps, and Navy maintain prepositioned equipment stocks. These services do not need to use their annual budget to maintain prepositioned equipment when it is being used during operations since the department would request wartime funding for the use and maintenance of this equipment. This essentially reduces the current costs of prepositioned forces; however, the need to replenish and maintain this equipment at the end of operations will increase future claims on the annual budget. The amounts budgeted for prepositioned forces in the Army, Navy and Marine Corps decreased in real terms from 2000 through 2011. Figure 5.2 highlights the decline in spending on prepositioning of military forces since 2000.

¹²⁴ Ibid., ix.

¹²⁵ The services are often able to adjust these spending requirements by foregoing maintenance during periods with reduced budgets. Thus, the additional migration of costs forecasted in this section may take time to appear as claims on the annual budget.

Figure 5.2
Costs of Prepositioned Equipment (2011 \$ Millions)



Sources: Calculated from data collected in the DOD's annual O&M (O-1) requests.

The Army's funding for prepositioned equipment decreased the most over this period. The Army's 2011 O&M budget documents explain that of the five Brigade Combat Team (BCT) sets of equipment that are the focal point of this program, only one is complete; other sets are not complete due to recent operational requirements, but the Army expects to replenish these by 2015.¹²⁶ This would introduce an additional \$60 to 80 million to the annual O&M budget, assuming that maintaining the full set of prepositioned equipment will cost between the average and maximum costs during the prewar period.¹²⁷ The Navy and Marine Corps also face

¹²⁶ U.S. Department of the Army, *Fiscal Year 2011 Budget Estimates: Volume I: Operation and Maintenance, Army*, Washington, DC: Department of the Army, February 2010, 209.

¹²⁷ Replenishing these stocks of equipment may also introduce new claims on the annual procurement budget. However, there is not

potential increasing costs for prepositioned equipment. The Navy's prepositioned fleet has not substantially changed over this time and the department faces the potential for an additional \$125 to 200 million in annual O&M expenses for its prepositioned fleets. Marine Corps prepositioning costs will potentially increase by \$30 to 35 million annually. Analysis of the annual 2000 to 2011 budgets revealed some other areas where the costs declined in the base budget, in real terms or relative to the overall budget, and where the wartime budgets also increased.¹²⁸ Table 5.3 highlights these areas along with the expected ranges of future annual costs that will need to be included in the base budgets.¹²⁹

Other activities were introduced in supplemental appropriations bills that will likely migrate into the base budget. Interviewees suggested that programs the military services initiated to support families have become very popular, and the services may wish to continue these programs. One respondent specifically mentioned the success of the Yellow Ribbon Program, which "provides Reserve Component members and families with information, services, referral and proactive outreach opportunities through the entire deployment cycle."¹³⁰ The DOD also used its wartime budgets to fund some child care services, counseling and intervention and general family assistance.

sufficient data describing which types and how much prepositioned equipment the Army used during operations to estimate procurement costs.

¹²⁸ In some cases, a real decline was not likely accompanied by a shift based on the costs of the war. For example, during this period the U.S. Army Reserve reduced its requests for service wide activities, based largely on changes in its account for manpower management. This is not an area where the service requested additional wartime funding, and the change likely does not relate to shifting budgets.

¹²⁹ Army logistics operations are included since these costs grew by only 6 percent while the size of the Army expanded by more than 13 percent, with the overall O&M budget growing by 49 percent. Air Force mobilization is included for the same reason as it grew by 18 percent while the overall budget grew by about 43 percent.

¹³⁰ U.S. Department of Defense, *Fiscal Year 2009 Global War on Terror Bridge Request*, Washington, DC: Department of Defense, May 2008, 9.

Table 5.3
Future O&M Costs by Service

Service	Activity	Change in Annual Budget	Future Costs (2011 \$M)
Army	Mobilization	- 42%	200 - 230
Army	Logistics Operations	6%	Up to 700
Navy	Mobilization	-28%	195 - 265
Navy	Logistics Operations	-32%	550 - 900
MC	Prepositioned Equipment	-26%	30 - 35
MC	Service Wide Transportation	-18%	10 - 55
AF	Mobilization	18%	Up to 1,000
AF	Logistics Operations	-4%	Up to 330

Sources and Notes: Calculated from data collected in the DOD's annual O&M (O-1) requests. Mobilization estimates for the Army and Navy include prepositioned equipment. Change in annual budget was calculated based on the average prewar requests from 2000 - 2002.

The DOD provided about \$500 million for new programs in its 2010 OCO budget and reduced it to \$350 million in 2011 as the military services began shifting this funding into their annual budgets. The conclusion of overseas operations would further reduce the amounts needed to continue these programs, so the potential for migrating costs would likely fall short of the \$500 million needed for the program in 2010. One interviewee also indicated that the DOD would expect the services to take on program costs when wartime funding declined.

CONCLUSIONS

The cases described in this chapter highlight several ways that military operations funded primarily outside annual appropriations may lead to future annual O&M budgetary claims even though the base budgets expanded during this time. The two major categories explored in this chapter were the expansion of benefits covered under the Defense Health Program and the potential for costs shifting from wartime into annual budgets in the future.

The expansion of healthcare benefits for reserve members followed a path similar to the expansion of other personnel benefits within the military personnel title. The benefits were introduced in a supplemental appropriations bill for the sake of convenience and reliability of

passage; subsequently the benefits were made permanent in authorizing legislation. Thus, the costs quickly migrated from supplemental appropriations into the annual budget. However, unlike some personnel benefits that are not indexed to inflation, the expansion of healthcare coverage introduces both new and increasing O&M costs to the base budget. These costs will rise based on both expanding enrollment along with growth in the underlying costs of health care. While TRS has remained relatively small thus far, it has the potential to expand.

The other major category described in this chapter focused on the potential of costs shifting from wartime budgets into the base budget. This can happen when costs either first move from the base to the wartime budget or new programs introduced as part of the war become permanent. Migration of costs from the wartime budget into the base are important since these expenses may not be expected in future plans. Much of these heretofore unrealized costs are associated with equipment maintenance, which may further increase as equipment ages.¹³¹ Estimates presented in this section highlight the potential to increase each of the service's annual budgets by:

- Army: \$1.34 billion
- Navy: \$1.17 billion
- Marine Corps: \$220 million
- Air Force: \$1.82 billion

These potential costs represent new claims that are 3 to 5 percent of the services' 2011 O&M budget requests. Additionally, there may be other areas where costs may transfer in the future but are masked by annual growth since 2000. Yet this begs the questions: in what ways are identifying the influence of wartime policies on the base defense budget that important and how will these expected claims on the base budget challenge the department?

There are several reasons to expect that currently unrealized claims on the annual budget will be problematic. First of all, several

¹³¹ Williams, Cindy, "The U.S. Defense Budget," Testimony before the Committee on the Budget, United States Senate, February 23, 2010.

interviewees noted that as the base budget expanded and the wartime budgets were developed, decision makers faced very few tradeoff decisions. The absence of normal constraints and tradeoffs may potentially lead to reduced awareness of base operating costs as well as how to determine the requisite O&M budget for long term defense plans. One interviewee highlighted this potential challenge questioning whether the department began "programming via supplementals or programming via the programming process." As new budgetary claims begin to emerge, the department will begin facing additional decisions on how to scale back other programs to keep total spending within its overall budget constraint. Further, the reduction in institutional experience in programming under constraints may emerge as a major challenge if the DOD faces a severely constricted budget in the future. Some interviewees suggested that the introduction of these future trades presented the greatest risks of using supplemental appropriations over an extended period of time.

Historically, the annual defense budget is cyclical, with periods of growth followed by contraction. Recently, the annual budget declined through the 1990s, grew throughout the 2000s as U.S. military forces conducted operations in Iraq and Afghanistan, and many expect the defense budget to decline soon. Ippolito (2005) described the interdependencies of the overall federal budget, noting that other fiscal demands will constrain the defense budget over time, and that "defense plans that assume steady increases in real spending levels are fiscally unrealistic and politically naïve."¹³²

There are currently several federal budget proposals that include cuts to annual defense budget. The National Commission on Fiscal Responsibility and Reform (2010) included defense cuts explaining that "every federal agency will need to do its part to live within tough spending caps," and went on to recommend "trimming redundant or

¹³² Ippolito, Dennis S., "Budget Policy, Deficits, and Defense: A Fiscal Framework for Defense Planning," Carlisle, PA: Strategic Studies Institute, June 2005, 33.

ineffective weapons from the Defense Department's inventory."¹³³ As of March 2011, the DOD expected about 1.5 percent real growth in its annual budget from 2012 to 2016.¹³⁴ Since then, the president indicated that he expects to cut \$400 billion in defense spending by 2023.¹³⁵

New claims on the defense budget during a time when it is expected to decline will create additional challenges for planners and decision makers within the DOD. Essentially, the new claims introduce additional tradeoffs that decision makers must face. For example, if a service expects its budget to decline by \$1 billion but cost migrations occur to create additional claims of \$1 billion, the service would experience \$2 billion of tradeoffs. The potential for new claims shifting back into the annual budget will come at the least opportune time for the military services.

¹³³ National Commission on Fiscal Responsibility and Reform, *The Moment of Truth*, Washington, DC: White House, December 2010, 24-25.

¹³⁴ Calculated from data collected in U.S. Department of Defense, *National Defense Budget Estimates for FY2012*, Washington, DC: Department of Defense, March 2011, 80.

¹³⁵ Hodge, Nathan, "Military Chiefs to Work on Cutting \$400 Billion," *Wall Street Journal*, June 17, 2011.

6. WARTIME ACQUISITION IMPACTS FORCE STRUCTURES AND OPERATING COSTS

Military forces operating overseas in Iraq and Afghanistan faced different types of challenges than those expected when these units were designed. The new threats and difficult operating environments during protracted operations necessitated the acquisition of additional and often nonstandard equipment. About 25 percent of the funding for recent military operations was directed towards developing and acquiring new equipment. The types of equipment acquired using this funding span from personal protection equipment like body armor to new vehicles and even aircraft. This chapter identifies how equipment purchased for military operations using wartime appropriations impacts the force structures of the military services as well as their operating budgets. The cases presented in this chapter include the impact of armoring the TWV fleet along with the acquisition of advanced tactical radios.

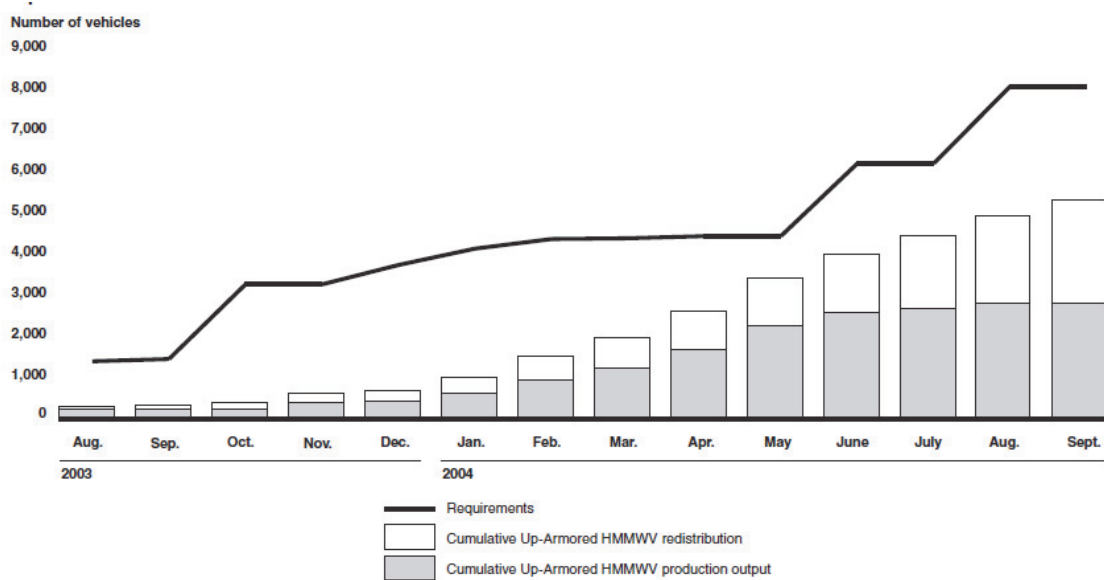
VEHICLE ARMORING

The TWV fleet used by ground forces during OEF and OIF changed dramatically during the course of these operations. The introduction and success of improvised explosive devices (IEDs) used by enemy forces prompted many of these changes. During the course of operations, U.S. forces worked to improve the armored protection provided by the TWV fleet through a cycle of adding armor to existing vehicles and acquiring new vehicles that offered greater protection. This section provides an overview of these vehicle changes, focusing on the light TWV fleet, and highlights the role of wartime appropriations in the vehicle evolution process. It also examines recent changes in force designs along with the potential for additional design changes in the future, estimating the potential costs of these actions in the annual budget.

After the introduction of IEDs in Iraq in the summer of 2003, U.S. military forces quickly began responding by adding armor to the existing light skinned High Mobility Multipurpose Wheeled Vehicle (HMMWV) fleet as well as acquiring up-armored HMMWVs (UAHs) to enhance the protection these vehicles provided to crew members. UAHs improved protection over

existing HMMWVs through "ballistic-resistant windows and steel-plate armor on the doors and underside to protect against rifle rounds and explosive blasts."¹³⁶ Figure 6.1 highlights how the requirements for UAHs grew during early stages of operations in Iraq, and how the DOD began fulfilling these requirements through 2004.

Figure 6.1
Up-Armored HMMWV Requirements, Production Output, and Redistribution
from August 2003 through September 2004



Source: GAO analysis of Army data.

Source: U.S. Government Accountability Office, *Defense Logistics: Actions Needed to Improve the Availability of Critical Items during Current and Future Operations*, GAO-05-275, Washington, DC: GAO, April 2005, 121.

In September 2003, the DOD submitted a request for supplemental appropriations over the next year that included \$177 million for 747 UAHs for the Army. This was the first wartime request for resources to acquire UAHs during recent military operations. From 2004 through 2011, the DOD requested a total of about \$8 billion for the procurement of

¹³⁶ U.S. Government Accountability Office, *Defense Logistics: Actions Needed to Improve the Availability of Critical Items during Current and Future Operations*, GAO-05-275, Washington, DC: GAO, April 2005, 117-118.

HMMWVs. The Army received about 86 percent of this funding, which was used to procure over 35,000 new UAHs during this period. In addition to fielding UAHs, the DOD also applied additional armoring kits to existing vehicles as weaknesses were identified.

The employment of UAHs in Iraq and Afghanistan along with the growing importance of force protection eventually led to their inclusion in the basic force structure of the Army. Army documents explained the need to "allow armor-capable models of HMMWV armament carriers to substitute for any unarmored HMMWV armament carriers or command and control variants" to provide armored protection capabilities in the Army's force structure.¹³⁷ This eventually led to an official change in the basic force design between 2008 and 2010 when UAHs replaced basic HMMWV models in the force design of the Army's BCTs.¹³⁸

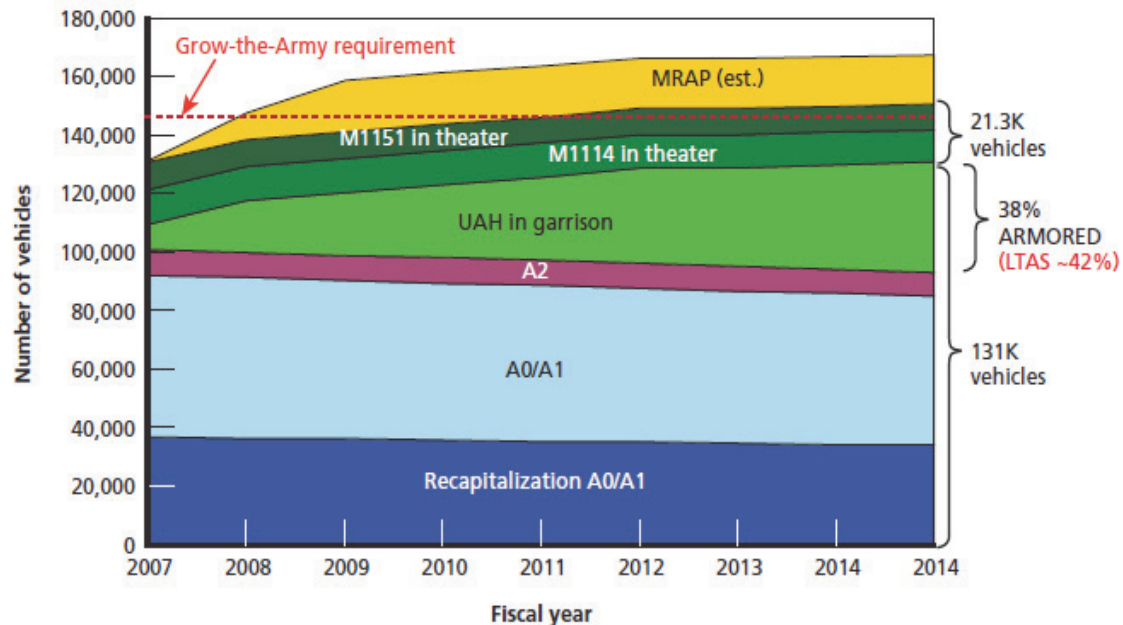
The procurement of large numbers of UAHs using supplemental appropriations followed by their substitution into the basic Army force structure and annual budget highlights another potential way that military operations and wartime budgets may influence annual costs. Figure 6.2 shows how the light TWV fleet changed and is expected to change in the future. The Army used wartime funds to cover much of the investment in new UAHs, reducing the amount of funding needed in the annual budget to change the force design of BCTs. This potentially made the force design change possible. However, UAHs cost more to acquire and operate than basic HMMWVs, and the substitution of UAHs into the force design introduces new costs associated with operating, maintaining, and replacing them. Calculations using data collected from the Army Operating and Support Management Information System (OSMIS) database indicate that UAHs cost about \$600 more per year to operate than other

¹³⁷ U.S. Army, Deputy Chief of Staff - G-8, *The Army Tactical Wheeled Vehicle Investment Strategy*, Washington, DC" U.S. Army, October 2009, 5-6.

¹³⁸ This change is identified by examining changes in FKSM 71-8 from April 2008 to May 2010; U.S. Army, *Armor/Cavalry Reference Data: Brigade Combat Teams*, FKSM 71-8, Fort Knox: U.S. Army Armor Center, April 2008 and U.S. Army, *Armor/Cavalry Reference Data: Brigade Combat Teams*, FKSM 71-8, Fort Knox: U.S. Army Armor Center, May 2010.

HMMWVs. Thus, the substitution of UAHs for HMMWVs into the force structure of BCTs increases the annual operating costs for active component BCTs by about \$12 million per year.¹³⁹

Figure 6.2
Army Light Tactical Wheeled Vehicle Fleet Through 2014



Source: Wong, Carolyn et al., *Army Tactical Wheeled Vehicles: Current Fleet Profiles and Potential Strategy Implications*, Santa Monica, CA: RAND Corporation, TR-890-A, 2011, 72. 1 percent per year noncombat attrition rate included.

Even though the military services, particularly the Army and Marine Corps, greatly improved the survivability of their TWV fleets in Iraq and Afghanistan with the fielding of UAHs, their TWV fleets remained vulnerable to enemy weapons and tactics. Enemy forces found weaknesses in UAHs whose "wide, flat underside has been particularly vulnerable to the upward explosive force exerted by a buried IED."¹⁴⁰ Thus, the DOD

¹³⁹ Calculated using force structure data collected from Johnson et al., *A Review of the Army's Modular Force Structure*, TR-927-1-OSD, Santa Monica, CA: RAND Corporation, 2011, 32 and FKSM 71-8, May 2010.

¹⁴⁰ Krepinevich, Andrew F. and Dakota L. Wood, *Of IEDs and MRAPs: Force Protection in Complex Irregular Operations*, Washington D.C.: Center for Strategic and Budgetary Assessments, 2007, 6.

sought to further improve the protection of vehicle occupants by acquiring the MRAP family of vehicles.

Mine resistant vehicles were first introduced in combat during the Rhodesian Bush War in the mid-1970s when Rhodesian forces, struggling with "guerilla laid landmines," opted to armor vehicles instead of trying to protect vast lines of control.¹⁴¹ The MRAP family of vehicles differs from UAHs and other TWV models in several important ways. MRAPs have a V-shaped hull designed to deflect the blast of a mine or IED "away from the passengers and crew aboard the vehicle" while also providing additional "stand-off distance from any buried mine encountered."¹⁴² This feature contrasts with other TWVs, which typically feature flat underbellies that are much more vulnerable to the effects of mines.

As early as 2002, some Marine Corps officers began advocating for the introduction of a new class of vehicles (they called the Mine-Resistant, Ambush-Protected vehicle) as an off the shelf solution for armoring vehicles until the DOD could develop and field the Joint Light Tactical Vehicle (JLTV).¹⁴³ In 2005, a Marine Corps commander in western Iraq requested new "armored tactical vehicles to increase crew protection and mobility of Marines operating in hazardous fire areas against IEDs, rocket-propelled grenades, and small arms fire."¹⁴⁴ The Marine Corps "placed an order for the first 144 vehicles to respond to the urgent requirement" in November 2006.¹⁴⁵ After the initial order in 2006, further requests for vehicles with additional protection eventually led to the decision in February 2007 to begin acquisition of MRAPs for all of the services deployed to Iraq and Afghanistan. At this

¹⁴¹ Sinclair, Wayne A., "Answering the Landmine," *Marine Corps Gazette*, Volume 80, Number 7, July 1996, 37-40.

¹⁴² Ibid., 38.

¹⁴³ Gayl, Franz, *Mine Resistant Ambush Protected Vehicle (MRAP): Ground Combat Element Advocate Science and Technology Advisor Case Study*, January 22, 2008, 5-10.

¹⁴⁴ U.S. Government Accountability, *Defense Acquisitions: Rapid Acquisition of MRAP Vehicles*, GAO-10-155T, Washington, DC: GAO, October 8, 2009, 1-2.

¹⁴⁵ Ibid., 2.

time, the Joint Requirements Oversight Council validated a requirement of 6,738 MRAPs.¹⁴⁶ In May 2007, Secretary of Defense Robert Gates published a memorandum declaring that "the MRAP program should be considered the highest priority for the DOD acquisition program."¹⁴⁷ This began a very large, rapid acquisition program whose goal was to provide MRAPs to deployed forces as quickly as possible. Eventually, the DOD also acquired additional armoring kits for MRAPs to further reduce vulnerabilities to certain enemy weapons.

As the program began, the DOD planned to acquire three distinct types of MRAPs, categorized by their size and mission types. Over time, the DOD procured a fourth type, the MRAP All Terrain Vehicle (M-ATV), which provided better mobility suited for the difficult terrain in Afghanistan. Table 6.1 highlights the general characteristics of each type of MRAP.

Table 6.1
MRAPs Variants

Category	Features	Mission Sets
Category I	Carry up to 7 personnel; weighs 7 - 15 tons	Mounted patrols in urban combat environment
Category II	Carry up to 10 personnel; weighs 15 - 25 tons	Convoy escort, transport, medical, explosive ordnance disposal, combat engineer
Category III	Carry up to 13 personnel; weighs about 25 tons	Route clearance operations
M-ATV	Carry up to 4 personnel; weighs about 13 tons	Mounted patrols, convoy security, combat service support

Sources: Sullivan, Michael J., *Defense Acquisitions: Rapid Acquisitions of MRAP Vehicles*, GAO-10-155T, Washington D.C.: GAO, 2009 and Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, August 24, 2010.

¹⁴⁶ Strickland, James, *Briefing: MRAP Vehicles - Rapid Acquisition to Organic Maintenance Support*, 2010 DOD Maintenance Symposium.

¹⁴⁷ Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington, DC: Congressional Research Service, August 21, 2007, 2.

The MRAP program began rapidly after being declared the top priority for defense acquisition. Secretary Gates (2008) touted the success of the MRAP program, explaining that "the last time American industry moved from concept to full-rate military production in less than a year was World War II."¹⁴⁸ The requirements for MRAP vehicles in Iraq and Afghanistan grew rapidly as the program began in 2006. From March 2006 through January 2010, requirements for MRAPs grew from zero to over 27,000 vehicles spread across each of the military services and the special operations community.¹⁴⁹ Once fielded, the MRAP family of vehicles dramatically increased the protection of vehicle occupants deployed to Iraq and Afghanistan. These vehicles may be credited as one of the reasons U.S. casualties in Iraq steadily decreased after 2007.

The DOD began requesting significant amounts of funding for the MRAP program in March 2007, amending its request for emergency supplemental appropriations by adding a total of \$500 million to procure MRAPs for the Army and Marine Corps. That same month, Congress began pressing the Army and Marine Corps to request more funding for the program. Lamb et al. (2009) criticized the requirements process used by the DOD for delays in acquiring these vehicles, stating that three years after initial requests for MRAPs for deployed forces, the services finally requested more funding when Congress stated it "was willing to do so over and above the Pentagon's normal budget and its war fighting supplemental."¹⁵⁰

After 2007, funding requests for MRAPs quickly increased; the department requested \$14.9 billion in 2008, \$2.7 billion in 2009, and \$5.5 billion in 2010 for MRAPs. The MRAP program received approximately \$44.6 billion through 2011, shown in Table 6.2.

¹⁴⁸ Gates, Robert M., *Speech: Space and Naval Warfare Center MRAP Facility*, January 18, 2008. Accessed January 21, 2011 at: <http://www.defense.gov/speeches/speech.aspx?speechid=1209>.

¹⁴⁹ U.S. Department of Defense, *Fiscal Year 2012 Budget Estimates: Mine Resistant Ambush Protected (MRAP) Fund*, Washington, DC: Department of Defense, February 2011.

¹⁵⁰ Lamb, Christopher J., Matthew J. Schmidt, and Berit G. Fitzimmons, *MRAPs, Irregular Warfare, and Pentagon Reform*, Washington, DC: National Defense University Press, June 2009, 15.

Table 6.2
MRAP Program Funding 2006 Through 2011 (Current \$, Billions)

	2006	2007	2008	2009	2010	2011
Wartime Appropriations	.17	3.75	16.83	6.44	7.40	3.15
Reprogramming	0	1.64	0	0	3.90	0
Total	.17	5.39	16.83	6.44	11.30	3.15

Sources: Appropriations Bills: P.L. 110-28, P.L. 110-92, P.L. 110-116, P.L. 111-32, and P.L. 111-118; DOD Budget Justification Documents for FY2008, FY2009, and FY2010; and Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington D.C.: Congressional Research Service, August 24, 2010.

Budgeting actions by the DOD highlight the importance placed on this program after Secretary Gates began to emphasize it. On separate occasions, the DOD reprogrammed money to increase the funding for MRAPs, expanding the MRAP program in 2007 by reprogramming additional funding for MRAPs and doing so again in 2010.

Congress also showed special interest in the MRAP program, allocating more than the DOD requested for MRAPs each year from 2007 through 2010. Not only did Congress allocate more funding than the DOD requested, members of Congress also criticized the Army and Marine Corps for not acting fast enough in acquiring MRAPs.¹⁵¹ To this end, Senator Biden submitted an amendment to the NDAA for 2008 that would have authorized \$23.6 billion for MRAPs, nearly \$10 billion more than requested, while also requiring the Secretary of Defense to submit monthly reports highlighting progress on acquiring MRAPs and the DOD's efforts to protect service members from explosively formed penetrators.¹⁵² Though the amendment failed to pass into law, Biden

¹⁵¹ Ibid., 14-15.

¹⁵² GovTrack.us, "S.Amend. 3075: To Provide Funds for Improvised Explosive Device Protection for Military Vehicles," Accessed on January 24, 2011 at: <http://www.govtrack.us/congress/amendment.xpd?session=110&amdt=s3075>

declared, "I'm willing to waste money and equipment if it means we don't waste lives and limbs."¹⁵³

As the DOD began to prioritize fielding MRAPs, industry jumped at the chance to begin fulfilling the rapidly growing requirements for them. By August 2007, the Marine Corps had placed initial orders for MRAPs from seven different companies.¹⁵⁴ Not all of the models ordered at this time were fielded as some did not perform well during testing, and most MRAP Category I through Category III vehicles were eventually produced by five separate vendors.

Several aspects of the way that the DOD managed the MRAP program distinguish it as a unique acquisition program. The DOD began the MRAP program using a "concurrent approach to producing, testing, and fielding" which led to a "high degree of overlap between testing and fielding."¹⁵⁵ The MRAP program also "relied heavily on commercially available products."¹⁵⁶ The program essentially skipped most stages of the normal acquisition process as the DOD ordered many vehicles even before it began testing them and increased these orders before completing vehicle testing.¹⁵⁷ In addition, the vehicle program hardly pressed the edge of the technology envelope. These factors allowed the DOD to rapidly field MRAPs after the decision was made to acquire them.

The Secretary of Defense also approved the MRAP program as a DX program, distinguishing it as, "of the highest national defense urgency based on military objectives."¹⁵⁸ This designation placed special priority on MRAPs over other programs that did not have this rating and allowed contractors "access to more critical materials than otherwise

¹⁵³ Vanden Brook, Tom, "Autumn Will be Crucial Time for MRAP Project," *U.S.A Today*, July 19, 2007, Accessed January 24, 2011 at: http://www.usatoday.com/news/military/2007-07-19-autumn-mrap_N.htm.

¹⁵⁴ Feickert, 2007, 3.

¹⁵⁵ U.S. Government Accountability Office, *Defense Acquisitions: Rapid Acquisition of Mine Resistant Ambush Protected Vehicles*, GAO-08-884R, Washington, DC: GAO, July 15, 2008, 2.

¹⁵⁶ _____, GAO-10-155T, 3.

¹⁵⁷ _____, GAO-08-884R, 5.

¹⁵⁸ U.S. Department of Defense, Undersecretary of Defense for Acquisition, Technology, and Logistics, *Department of Defense Priorities and Allocations Manual*, DOD 4400.1-M, February 2002, 40.

would have been available.”¹⁵⁹ Finally, the “DOD recognized that no single vendor could provide all of the vehicles needed to meet requirements quickly enough” so contracts were opened with multiple MRAP vendors.¹⁶⁰ Each of these factors, along with the ample funding provided for the program via supplemental appropriations, allowed vendors to quickly meet the DOD’s requirements for fielding MRAPs; by July 2009 vendors had produced 16,204 MRAPs with 13,848 fielded in Iraq and Afghanistan.¹⁶¹ In 2008, the DOD expanded the MRAP program to include the M-ATV model after recognizing the need to have a lighter weight MRAP with better mobility for use in Afghanistan.¹⁶² The DOD awarded the contract for making the M-ATV to a single vendor, Oshkosh, with plans to acquire about 8,100 M-ATVs.¹⁶³

While it is typical for many vendors to compete during major procurement programs, the large number of MRAP variants ordered and fielded from different manufacturers is unusual. The Deputy Program Manager for the MRAP program noted that challenges occur due to “the significant differences between the many MRAP variants – differences brought about by the urgency with which the vehicles were fielded.”¹⁶⁴ He went on to say that this urgency resulted in “32 variants and 125 configurations of” MRAPs.¹⁶⁵ The conditions under which the DOD pursued the MRAP program led it to acquire a large and varied fleet including different vehicles from a number of vendors. Table 6.3 provides an estimate of the MRAP fleet fielded by each of the military services for operations in Iraq and Afghanistan.

¹⁵⁹ GAO-10-155T, 7.

¹⁶⁰ GAO-08-884R., 5.

¹⁶¹ GAO-10-155T, 6.

¹⁶² Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington, DC: Congressional Research Service, April 27, 2009, 2.

¹⁶³ U.S. Government Accountability Office, *Defense Acquisitions: Issues to be Considered as DOD Modernizes Its Fleet of Tactical Wheeled Vehicles*, GAO-11-83, November 2010, 5.

¹⁶⁴ Burt, Andrew, “MRAP Acquisition Model Not Replicable, Deputy Program Manager Says,” *InsideDefense.com*, January 31, 2011.

¹⁶⁵ Ibid.

Table 6.3
Estimated MRAP Fleet by Service

Vendor	Vehicle	Category	Army	MC	Navy	AF	SOCOM	Total
Navistar	MaxxPro	I	1,700	300	0	400	0	2,400
	MaxxPro Plus	I	2,200	0	0	0	0	2,200
	MaxxPro Dash	I	1,800	0	0	0	0	1,800
Force Protection	Cougar	I	0	1,500	550	150	0	2,200
		II	300	350	0	0	0	650
	Buffalo	III	200	40	0	0	0	250
BAE/GDLS-C	RG31	I	1,200	100	0	0	0	1,300
		II	600	0	0	0	0	600
BAE/Armor Holdings	Caiman	I	2,500	0	0	0	400	2,900
BAE	RG33	I	1,100	0	0	0	300	1,400
		II	800	0	0	0	0	800
Oshkosh	M-ATV	M-ATV	5,000	2,000	100	300	700	8,100
Total			17,200	4,490	650	850	1,400	24,590

Sources: Multiple sources were used to develop the estimates displayed in this chart including documents from Congressional Research Service, Government Accountability Office, Jane's Defense Weekly, Defense Industry Daily, and vendor websites.

There are many lasting implications, related to future defense budgets and force structure development, from the recent acquisition of the MRAP family of vehicles for use in Iraq and Afghanistan. These implications largely derive from the rapid manner in which the MRAP fleet was developed using multiple vendors and the way the DOD and Congress resourced the program.

The large variation in vehicle producers and models introduces several potential long term training and maintenance challenges. First, different models and variants may operate differently, requiring some training time when transitioning between separate vendors' models. While the transition training time is likely short, it would inhibit quick substitutions during combat operations. Furthermore, different MRAPs may introduce unique model-specific maintenance issues that a more

standardized fleet would not have. Finally, a diverse fleet may also introduce new challenges and costs in the acquisition of spare parts. The Army, recognizing challenges from such a diverse fleet, decided to divest of "the early version of BAE Systems' RG-33 and the Cougar" because these MRAPs do not perform as well as other variants or there are not very many in the inventory.¹⁶⁶ Even after the decision to divest of these vehicles, the Army still has at least seven different variants of Category I and II MRAPs produced by four different vendors.

Other long term challenges arise from the manner in which the DOD and Congress funded the MRAP program. The DOD included the MRAP program only in its requests for wartime appropriations for a number of reasons. MRAPs were needed to fill a specific capability gap recognized in the vehicle fleet during ongoing operations. Further, the inclusion of MRAPs in the DOD's wartime budget meets the requirements for a wartime request outlined by OMB in 2009 and 2010 as "specialized, theater-specific equipment."¹⁶⁷ The development of JLTV for the future would allow the DOD to fill these capability gaps and to address the limitations of the MRAP family of vehicles. Including MRAPs in wartime budgets allowed the DOD to pursue this program without making tradeoffs against the capabilities it was developing through its annual budget.

Funding the program through the use of wartime appropriations allowed the services to acquire large numbers of MRAPs without making a formal commitment to long-term MRAP retention plans. Thus, the services did not have to describe their plans to incorporate MRAPs into their force structures or the future costs of sustaining these fleets.¹⁶⁸ In a speech in April 2009, Secretary of Defense Gates explained that the Army's, "current [Future Combat System] vehicle program, developed nine years ago, does not include a role for our recent \$25 billion investment

¹⁶⁶ Bertuca, Tony, "Army Wants to Divest 1,500 MRAPs; Two Variants," *InsideDefense.com*, January 27, 2011.

¹⁶⁷ U.S. Executive Office of the President, Office of Management and Budget, "Criteria for War/Overseas Contingency Operations Funding Requests," July 2010.

¹⁶⁸ GAO-10-155T, 8.

in the MRAP vehicles being used to good effect in today's conflicts."¹⁶⁹ Decisions on how the services will integrate these vehicles into their future structures now loom on the near horizon. Some worry that as current operations draw to an end "many [MRAPs] will be left behind, and others likely to be declared excess defense articles and given away to other friendly forces;" thus, our recent investments will be "sacrificed in order to save some operations and maintenance costs."¹⁷⁰

The military services currently face options regarding how many MRAPs they will choose to incorporate into current force designs, store for future contingencies, or divest. The future annual operating costs related to MRAPs vary based on how the services decide to manage their fleets. Incorporating MRAPs into force structures will cost about \$9,000 per year for each vehicle while storing them would cost about \$1,800 per year.¹⁷¹ Thus, the services' annual O&M costs related to MRAPs may be as high as \$135 million for the Army, \$38 million for the Marine Corps, \$13 million for DOD and \$6 to 8 million for the Navy and Air Force.

The next chapter of this dissertation describes a detailed analysis of MRAP retention options for the Army. It highlights how MRAPs may fit into the Army's force structure in the future and makes specific MRAP fleet management recommendations.

TACTICAL RADIOS

The acquisition of tactical radios during recent military operations provides another example of how the use of separate wartime appropriations over a long period of time has the potential to influence the annual budget. In this case however, the procurement of some radios

¹⁶⁹ Gates, Robert M., *Speech: Defense Budget Recommendation Statement*, April 6, 2009, Accessed February 11, 2011 at: <http://www.defense.gov/speeches/speech.aspx?speechid=1341>.

¹⁷⁰ Lamb et.al., 33.

¹⁷¹ These estimates are based on data collected from the OSMIS database. Since MRAPs have been used almost exclusively during combat operations thus far, there is little data covering the potential peacetime usage and operating costs. Thus, these estimates are based on usage rates for other TWVs and adjust the operating costs based on contingency and training data for other TWVs.

may provide an opportunity to hedge risks of current development programs with the potential for reducing some future acquisition costs.

The Army and Marine Corps began requesting supplemental appropriations for tactical radios in 2005. From 2005 through 2011, they requested about \$22 billion in wartime funding for communications equipment. Much of these requests focused on procuring standard equipment needed for force design changes in the Army and Marine Corps, providing military organizations with additional communications equipment, and filling shortages in deploying organizations. For example, the Army requested \$5.8 billion in supplemental appropriations to procure additional standard Single Channel Ground and Airborne Radio Systems (SINCGARS) from 2005 through 2008.

The Army and Marine Corps also acquired other more advanced handheld and manpack radios for tactical units operating in Iraq and Afghanistan. The investment in advanced radios also comes at a time when the DOD is working on the Joint Tactical Radio System (JTRS) Program. The JTRS Program is an ongoing research and development program that expects to provide multiple radios for use across each of the military services. The ground radio programs of JTRS are nearing completion. According to the GAO, production decisions for JTRS handheld and manpack radios should take place in 2011.¹⁷²

In 2006, the services requested funding to acquire Multiband Inter/Intra Team Radios (MBITR) from Thales Communications.¹⁷³ Handheld MBITR radios offered interoperability with numerous waveforms that the Army uses, including SINCGARS, along with the ability to transmit data.¹⁷⁴ Eventually, Thales Communications also developed the JTRS

¹⁷² U.S. Government Accountability Office, *Defense Acquisitions: Assessment of Selected Weapon Programs*, GAO-11-233SP, Washington, DC: GAO, March 2011, 95-96.

¹⁷³ The Thales and Harris radios described in detail in this section are software defined radios. Signal handling by software defined radios is digitized, providing them with the potential means to communicate on multiple waveforms along with transmitting voice and data signals.

¹⁷⁴ Thales Communications Inc., "AN/PRC-148 MBITR," Accessed May 4, 2011 at: <https://secure.thalescomminc.com/datasheets/Thales%20MBITR.pdf>

Enhanced MBITR (JEM), which improved upon its earlier design and received approval for having JTRS Software Communications Architecture (SCA). Other advanced handheld radios were purchased from Harris Corporation. The Falcon III AN/PRC-152, another handheld tactical radio, also received approval for JTRS SCA compliance. Harris claims that its PRC-152 radios are "installed in the majority of MRAP vehicles deployed to Afghanistan."¹⁷⁵

The Harris Corporation also produces the Falcon III AN/PRC-117G manpack radio. This radio is also JTRS SCA compliant and provides wideband networking that "enables applications such as streaming video, simultaneous voice and data feeds, collaborative chat, and connectivity to secure networks such as SIPRNet, providing war fighters and field commanders with critical real-time information through a man-portable radio."¹⁷⁶ Further, the PRC-117G offers mission modules allowing additional "functionality such as a second wideband channel, high-frequency communications, [Intelligence, Surveillance and Reconnaissance] (ISR) and jamming."¹⁷⁷ The Army is working to field about 2,000 PRC-117G radios in Afghanistan.¹⁷⁸

The DOD procured these advanced handheld and manpack radios to meet specific operational needs throughout recent operations. The radios provided deployed units with greater communications capabilities than legacy radio systems. The JEM and Falcon III radios provide many of the

¹⁷⁵ Harris Corporation, "Harris Corporation Receives \$24.5 Million Order from U.S. Army and U.S. Department of Defense for Falcon III Handheld and Vehicular Tactical Radio Systems," Accessed May 3, 2011 at: http://www.rfcomm.harris.com/news/view_pressrelease.asp?act=lookup&pr_id=3136

¹⁷⁶ Harris Corporation, "AN/PRC-117G Wideband Networking in Action," Accessed May 4, 2011 at: <http://www.rfcomm.harris.com/capabilities/tactical-radios-networking/an-prc-117g/an-prc-117g-wideband-networking-in-action.asp>

¹⁷⁷ Child, Jeff, "Tech Recon: Tactical Radios Make Progress on All Fronts," *COTS Journal: The Journal of Military Electronics and Computing*, Vol. 12, No. 11, November 2010, 22- 24.

¹⁷⁸ Heininger, Claire, "Diverse Radio Fleet, Dedicated Field Support Enhance Soldier Communications," May 3, 2011, Accessed May 4, 2011 at: <http://www.army.mil/-news/2011/05/03/55876-diverse-radio-fleet-dedicated-field-support-enhance-soldier-communications/>

capabilities that the JTRS Program expects to deliver in its Handheld, Manpack, and Small Form Fit (HMS) family of radios. Furthermore, the radios highlighted above received certification for JTRS SCA compliance. The development and fielding of these radios during recent operations represent real advances in tactical communications for the Army and Marine Corps.

The Harris Corporation is also "leveraging the JTRS Enterprise Business Model which allows radio developers access to JTRS software capabilities for integration into their products without government contracts and funding."¹⁷⁹ Using this business model, Harris' PRC-117G and ITT's Soldier-Rifleman Radio demonstrated interoperability of the Soldier Radio Waveform (SRW), which is the "first time that independently developed tactical radios have interoperated using open-standard wideband JTRS technology."¹⁸⁰ Thus, Harris is attempting to enter into competition to provide JTRS radios for the military services. Other producers voiced concerns that even though Harris and ITT demonstrated this exchange, they may face difficulties being certified by the National Security Agency, and they may have struggle to incorporate these radios within a larger network using SRW.¹⁸¹

While none of these radios acquired during operations were designed to meet the exact specifications of the ongoing JTRS development programs, they do provide some of the capabilities the services expect the JTRS program to deliver. Additionally, these radios have already been fielded and used during military operations. The development and fielding of these radios to meet current operational needs represent incremental steps towards the capabilities expected from development

¹⁷⁹ Joint Program Executive Office, Joint Tactical Radio System, "News Release: JTRS SRW Network Manager Successfully Completes FQT," February 2, 2011.

¹⁸⁰ Harris Corporation, "News Release: Harris Corporation and ITT Corporation Team to Accelerate Availability of Soldier Radio Waveform," October 22, 2010.

¹⁸¹ Bertuca, Tony, "GD Not Worried As Harris Announces Integration Of Key Radio Waveform," *Inside the Army*, December 27, 2010.

programs. Thus, they provide a potential hedge against the possibility that the JTRS program fails to provide the expected capabilities or is scaled back.

Furthermore, the military services already have an inventory of these advanced radios, and some are interoperable with other JTRS radios. They may provide the capabilities needed by some nodes within the future network. Already, "statements from Army leaders and program officials have also signalled an increased comfort with integrating commercial solutions with programs of record."¹⁸² The services should consider whether and how to integrate these radios into their current force design plans. This could allow the services to cope with plans to "buy far fewer radios - in particular the more expensive handheld and manpack - than initially planned."¹⁸³

CONCLUSIONS

During recent military operations, the DOD and military services procured new equipment to meet immediate needs. However, the equipment acquired may provide capabilities the services desire beyond these operations. The cases examined in this chapter highlight how wartime investments impact force structures, introduce new O&M costs, and may provide alternatives for future force development. In each of these cases, the equipment procured requires that the military services make choices regarding whether to integrate, store, or divest of these new systems.

Wartime procurement of UAHs focused on improving the protection of vehicle crew members. Over time, TWV armored protection became a priority for force planners as well and they substituted UAHs into Army brigades' force designs. The integration of these vehicles, which are more expensive to operate, increases the base O&M costs for Army brigades. Some other items purchased during operations, like unmanned aerial systems, sensors, and some additional communications

¹⁸² Bertuca, Tony, "Enterprise Business Model Praised As JTRS Waveform Completes Test," *Inside the Army*, February 7, 2011.

¹⁸³ GAO-11-233SP, 96.

capabilities, were also incorporated into the basic design of some units. Wartime procurement appropriations helped to purchase these items by defraying costs from the annual budget; however when items are added to force designs or a substitution is made with more expensive items, they introduce additional O&M costs into the base budget. There are some other types of equipment, like MRAPs, acquired to meet operational needs during recent operations that do not have a clear place in current force designs. The military services should consider both the additional capabilities and operating costs of this equipment as they approach decisions on how to manage these inventories.

Some items acquired during recent operations provide new capabilities in areas with ongoing programs. Tactical radios provide one clear example, with the equipment procured adding important new capabilities; however the JTRS program is expected to provide even greater improvements. In cases like these, the equipment acquired provides a hedge against setbacks in development programs and may also allow the services to manage reduced acquisition numbers in the future.

7. ARMY MRAP RETENTION

During the course of operations in Iraq and Afghanistan, the Army procured over 17,000 MRAP vehicles to enhance service members' protection against the effects of IEDs. While the MRAP family of vehicles provided a desired capability during recent operations, they are not currently a part of the Army's force design. Thus, the Army must determine how to manage this fleet of non-standard equipment as operations conclude.

The Army recognizes the need to develop an MRAP retention plan, explaining that it is making "plans for their long-term integration into the force."¹⁸⁴ In February 2010, the Chief of Staff of the Army explained that the Army "will incorporate packaged sets of MRAPs into BCTs and other formations as part of the [Army Force Generation] cycle (ARFORGEN)."¹⁸⁵ In June 2010, the Army indicated that it is, "considering a plan to allocate over 9,000" MRAPs to "Army Pre-Positioned Stocks (APS) and [Continental United States] (CONUS) storage facilities" while integrating "approximately 6,000 vehicles in Modification Table of Organization and Equipment (MTOE) units, training, sustainment, and war reserve stocks."¹⁸⁶ Feickert (2010) reported that a separate Army briefing explained that:

5,750 [MRAPs] will be assigned to infantry brigade combat teams, 1,700 to heavy brigade combat teams, and about 165 to Stryker brigades. Support units will be assigned about 5,350 vehicles, about 1,000 MRAPs will be used for home station and institutional

¹⁸⁴ U.S. Department of the Army, Deputy Chief of Staff G-8, 2009, 4.

¹⁸⁵ Casey, George W., "BCT Modernization: Versatile Capabilities for an Uncertain Future," February 19, 2010, Accessed February 11, 2011 at: http://www.bctmod.army.mil/news/pdf/Army_Brigade_Combat_Team_Modernization_Versatile_Capabilities_for_an_Uncertain_Future.pdf

¹⁸⁶ U.S. Department of the Army, *Army Truck Program (Tactical Wheeled Vehicle Acquisition Strategy) Report to the Congress*, Washington D.C: Department of the Army, June 2010, 23. MTOE, as used above, refers to operational organizations in the Army. MTOE may also refer to the basic set of equipment assigned to operational Army units.

training, and approximately 1,000 MRAPs will be assigned to war reserve stocks and be used to replace damaged or destroyed MRAPs.¹⁸⁷

These Army documents, published at similar times, indicate that there are many different ways the Army may choose to manage its MRAP fleet. As it weighs these plans, the Army should consider the enduring operational utility of its MRAP vehicles, various roles MRAPs may fill in Army force structures, and how different options for MRAPs may affect future annual budgets. This chapter examines the potential roles that MRAPs may play in the Army's force structure, details several options for managing the MRAP fleet, and recommends that the Army retain a significant number of MRAPs.

IDENTIFYING POTENTIAL ROLES FOR MRAPs

The DOD acquired MRAPs to meet very specific protection requirements for units conducting Irregular Warfare (IW) operations in unique theaters, and their integration into the Army's wheeled vehicle fleets may greatly affect the capabilities of tactical organizations. MRAPs may serve to augment current and future fleets, or the Army may substitute them for other vehicles. As the program began in 2007, the Army viewed MRAPs simply as an "augmentation to the Theater HMMWV fleet" since they were not likely capable of completing "all the mission requirements currently executed by up-armored HMMWVs."¹⁸⁸ By 2009, this view changed as the Army explained that MRAPs, "have been fielded, in large part, to replace UAHs" in Iraq and Afghanistan.¹⁸⁹

This section explores some of the roles that MRAPs may be able to fill in future vehicle fleets, essentially asking the question: Can an MRAP be anything more than an MRAP? This exploration highlights the capabilities and limitations provided by the MRAP family of vehicles

¹⁸⁷ Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington D.C.: Congressional Research Service, August 24, 2010, 2.

¹⁸⁸ U.S. Department of the Army, *2007 Army Modernization Plan*, March 5, 2007. 132

¹⁸⁹ U.S. Department of the Army, *Army Tactical Wheeled Investment Strategy*, October 2009, 6.

based on a comparative analysis of MRAPs and some other light and medium TWVs across several areas of vehicle operations.

Discussions of operational criteria often focus on the "iron triangle" of vehicle requirements, specifically, "performance (recently emphasizing power), protection, and payload."¹⁹⁰ I used these criteria, including several additional measures of performance, to compare MRAPs with other TWVs. During the course of operations, the Army procured a large number of MRAP models and variants from several different producers. Table 7.1 highlights the MRAP models considered in this analysis.

Table 7.1
Army MRAP Models

Vendor	Vehicle	Estimated Number
Navistar	MaxxPro	1,700
	MaxxPro Plus	2,200
	MaxxPro Dash	1,800
Force Protection	Cougar	300
BAE/GDLS-C	RG31	1,800
BAE/Armor Holdings	Caiman	2,500
BAE	RG33	1,900
Oshkosh	M-ATV	5,000
Total		17,200

Sources: Multiple sources were used to develop the estimates displayed in this table, including documents from the Congressional Research Service, Government Accountability Office, Jane's Defense Weekly, Defense Industrial Daily, and vendor websites.

The different vehicle models and variants fielded provide varying levels of performance capabilities that must be considered when examining the roles MRAPs may fill. Table 7.2 highlights some of the performance characteristics of a few of the MRAP variants considered in

¹⁹⁰ Kelly, Terrence K. et al., *The U.S. Combat and Tactical Wheeled Vehicle Fleets - Issues and Suggestions for Congress*, MG-1093-OSD, Santa Monica, CA: RAND Corporation, 2011, 15.

this comparative analysis. Appendix C details the data for all of the vehicles used to conduct this analysis.

Table 7.2
MRAP Performance Characteristics

	M-ATV	MaxxPro Plus	Caiman 4x4
Gross Vehicle Weight (pounds)	27,500	53,000	37,000
Dimensions L/W/H (inches)	246/98/105	254/102/120	304/97/111
Ground Clearance (inches)	13.6	11	14
Turning Radius (feet)	54	62	62
Payload (pounds)	4,000	8,470	5,400
Seating	5	7-9	10

Sources: Oshkosh and Navistar vehicle specification documents, Military Periscope, "Cougar Mine-Resistant Vehicle," and U.S. Department of the Army, *Fielding and Use of the Mine Resistant Ambush Protected Vehicles at Army Installations in the United States*, Washington D.C.: Department of the Army, June 2009.

Performance and Payload

Vehicle performance consists of many different factors including a vehicle's ability to fill a desired role, mobility across different environments and levels of effort required for maintaining and sustaining the vehicle. This analysis includes payload along with performance since payload is a large factor in satisfying several different vehicle roles. Vehicles do not necessarily need to meet the requirements of many different roles; the U.S. Army fields multiple variants of HMMWVs because one variant is not able to fill all of the different roles required. However, it is necessary to consider which types of roles different versions of MRAPs may meet in order to understand where they may fit in the services' TWV fleets.

In examining the types of roles that MRAPs may fill, I compared them to several different wheeled vehicles the Army uses to equip BCTs, including most variants of UAHs along with two cargo variants in the Family of Medium Tactical Vehicles (FMTVs). The FMTV cargo vehicles included in this analysis are the Light Medium Tactical Vehicle (LMTV), a 4x4 cargo truck capable of carrying 5,000 pounds, and the Medium

Tactical Vehicle (MTV), a 6x6 cargo truck with a payload capacity of 10,000 pounds. Different variants of UAHs perform general purpose, command and control, weapons carrier, infantry transport, and logistics roles; FMTV variants are included for their logistics roles.

While none of the roles identified above have specific vehicle performance requirements for this comparison, the performance characteristics of the vehicles that carry out those roles allows for a comparison with the different MRAP models. For example, BCTs use the M1165 UAH for command and control or general purpose roles; the vehicle accommodates up to a four person crew and a payload of 2,200 to 4,800 pounds, depending on whether it is equipped with armoring kits. It also allows for the addition of a gun mount. UAH weapons carriers provide the ability for units to conduct mounted combat operations and require the ability to mount machine guns or missile launchers. All vehicles in the MRAP family have the capabilities to perform command and control, general purpose, or weapons carrier roles, with the exception that there is not an anti-tank MRAP variant equipped with a missile launcher.¹⁹¹ In order to be an infantry transporter, a vehicle should be able to carry a team of about five personnel in addition to the crew. The M-ATV and Category I Cougar cannot meet this role while other MRAP models can. Finally, vehicles that perform logistics roles provide a range of payloads that are generally over 5,000 pounds, while the MTV can carry up to 10,000 pounds. Several MRAPs have the potential to operate as logistics vehicles; the MaxxPro Plus, RG-33, and Caiman can carry payloads of at least 5,000 pounds, while the MaxxPro Dash and one of the Cougar models have payloads of 10,000 pounds or greater.

Even though a vehicle may have certain features, such as crew capacity or payload, that allow it to perform a certain role, it may not do so very well. Thus, this analysis also considers other MRAP performance characteristics. The first is the ability to operate in areas with austere infrastructure, defined as places with poorly built

¹⁹¹ Kranc, Ryan T., "MRAP Future Discussion Paper," *Small Wars Journal*, February 11, 2011, accessed March 8, 2011 at: <http://smallwarsjournal.com/blog/journal/docs-temp/676-kranc.pdf>

or narrow roads and bridges. The size and weight of a vehicle may severely restrict its mobility in these types of environments. As U.S. forces began introducing MRAPs in Afghanistan, they recognized that the size and weight of many models often prohibited their use during operations, and "as many as 5,000 MRAPs shipped to Afghanistan are reportedly not being used."¹⁹² The limitations of these MRAPs led to the acquisition of M-ATVs and Navistar's MaxxPro Dash, designed as a smaller and lighter version of the vendor's other models, for operations in Afghanistan.¹⁹³

MRAPs are heavier than most other TWVs and have a very high center of gravity, leading to high rates of rollovers and "falls due to ledges, slopes, or ground collapsing" from underneath the vehicles.¹⁹⁴ The average weight of the Category I MRAPs included in this analysis is about 41,000 pounds, three times more than the heaviest UAH variant, while Category II MRAPs can weigh up to 69,000 pounds. In addition to being very heavy, MRAPs are generally at least two feet taller than UAHs; this along with the V-shaped hull lead to their high center of gravity. One report indicates that rollover and tip-over accidents accounted for "42 percent of the 189 non-combat related MRAP accidents" which were "responsible for injuring 105 military personnel and killing eight."¹⁹⁵

Other size dimensions also limit the mobility of MRAPs in areas with austere infrastructure. MRAPs are 6 to 12 inches wider than most UAH models, and are also at least two feet longer than UAHs. This leads to a much wider turning radius than the UAHs; the M-ATV and MaxxPro Dash have the shortest turning radius among MRAPs, 54 feet, but it is still twice as wide as an UAH. These factors limit the mobility provided by

¹⁹² Feickert, August 24, 2010, 4.

¹⁹³ Navistar International Corporation, "Navistar Defense Begins Producing MaxxPro Dash; To Reach Full Production by Mid-October," October 2, 2008, Accessed 3 February 2011 at: <http://ir.navistar.com/releasedetail.cfm?releaseid=338284>

¹⁹⁴ Inside the Navy, "MRAP Rollover and Tipping Problem Bigger than Previous Data Suggests," *Inside the Navy*, November 1, 2010.

¹⁹⁵ Ibid.

MRAPs relative to UAHs, especially in areas with narrow roads and passageways or where sharp turns are required. MRAPs generally have less ground clearance than other TWVs but perform comparably to UAHs on other measures of off road performance. To deal with MRAPs' general mobility challenges, the Marine Corps chose to add a new suspension to some of their Cougar MRAPs, enhancing their "mobility and maneuverability for better performance in the rough terrain" in Afghanistan.¹⁹⁶

While many MRAP models have the general characteristics needed to fill the many different TWV roles in BCTs, they have very limited mobility relative to other TWVs, especially UAHs. Only the M-ATV, MaxxPro Dash and Cougar variants are able to operate in more austere environments like those found in Afghanistan, but the size and weight of the Cougar models limit their utility in some situations. The Army should consider the limited flexibility of many MRAP vehicles while developing longer term plans for their MRAP fleets. The MRAP family of vehicles will introduce new capability limitations if they are integrated directly into Army's TWV fleets and used across the spectrum of operations.

The ease of maintenance and sustainability also factor into a vehicle's overall performance. This analysis considered performance characteristics like operational availability, reliability and logistics effort required to support a vehicle's operation. While the operational availability for specific MRAP models was not available, the Army reported that units have been able to maintain "an average operational readiness rate of over 90 percent during a time of extremely high operational tempo."¹⁹⁷ This is much higher than the 80 percent readiness rate reported as the requirement for the M-ATV, and puts the MRAP

¹⁹⁶ Military Persiscope.com, "Cougar Mine-Resistant Vehicle," February 1, 2010. Accessed January 27, 2011 at: <http://www.militarypersiscope.com/weapons/gcv/apc/w0006423.html>

¹⁹⁷ U.S. Department of the Army, "Informational Paper: Mine Resistant Ambush Protected Vehicles," *Army Posture Statement 2010*, 2010, Accessed January 27, 2011 at: [https://secureweb2.hqda.pentagon.mil/vdas_armyposturestatement/2010/information_papers/Mine_Resistant_Ambush_Protected_Vehicles_\(MRAP\).asp](https://secureweb2.hqda.pentagon.mil/vdas_armyposturestatement/2010/information_papers/Mine_Resistant_Ambush_Protected_Vehicles_(MRAP).asp)

fleet's overall availability on par with UAHs.¹⁹⁸ However, this level of operational availability comes at a high price. The cost of maintaining MRAPs is about \$4.02 per mile during deployment, which is about 3.7 times greater than other TWVs; MRAPs' maintenance costs are more comparable to Stryker vehicles, which cost about \$4.27 per mile during deployments.¹⁹⁹

While vehicle reliability and operational availability are very important, another important consideration is the logistics support required to operate a given vehicle. Krepinevich and Wood (2007) explained that introducing MRAPs into Iraq and Afghanistan had the potential to increase logistics requirements such that MRAPs would, "further enlarge and complicate the force protection problem" they were intended to solve due to higher logistics demands.²⁰⁰ MRAPs consume roughly 3.5 times more fuel per mile than UAHs. The fuel consumption for MRAPs is slightly higher than MTVs, but they consume far less fuel per mile than tracked vehicles. Thus, replacing UAHs with MRAPs may greatly increase unit requirements for fuel, potentially increasing the amount of logistics assets needed to support an MRAP equipped organization.

Power generation is the final performance aspect considered. The need for power generation in a military vehicle has greatly increased in recent years due to the, "advent of tactical networks, computer-based battle command systems, and expectations of battle command on the move."²⁰¹ In this regard, the MRAP family of vehicles meets or exceeds the current generation of vehicles while falling far short of the capability requirements established for the development of the JLTV.

Protection

The measure of protection used for this analysis is simply how well a vehicle protects the crew and passengers from the effects of enemy

¹⁹⁸ GAO-10-155T, 14.

¹⁹⁹ The maintenance costs described in this section were estimated using the Army's OSMIS Relational Database. They include the costs of consumables and repairable items for each vehicle per mile used.

²⁰⁰ Krepinevich and Wood, 45.

²⁰¹ Kelly et.al., 109.

weapons. MRAPs provide higher levels of protection than other TWVs currently in service. Relative to UAHs, the V-shaped hull of an MRAP ensures far more underbody protection, while the armor on its sides provides better protection from IEDs. The DOD currently expects the JLTV family of vehicles to provide better protection than UAHs but not to reach the same levels of protection as MRAPs from underbelly IEDs or explosively formed projectiles.²⁰²

While the MRAP family of vehicles offers greater protection than other TWVs in the current and future fleets, this protection is unnecessary in many operating environments where TWVs are or will be used in the future. In permissive environments, crew members and passengers do not need the additional armored protection provided by MRAPs. It is only in non-permissive environments (like those in Iraq and Afghanistan where enemy forces are likely to use IEDs or ambushes) that the armored protection provided by MRAPs emerges as very important.

MRAP Vehicle Evaluation

Evaluating the capabilities and limitations of the many MRAP vehicles is necessary for considering different options the military services have for this fleet. The M-ATV and MaxxPro Dash stand out as providing more flexibility than other MRAP models due to their ability to operate in more austere environments and the Dash's ability to transport personnel and cargo. Other MRAPs that have acceptable capacity to carry personnel or supplies are far less able to operate in austere environments, limiting the general ability of U.S. forces to use them. Overall, the MRAP family of vehicles costs more to operate and maintain and is more difficult to sustain than UAHs and FMTVs.

The MRAP family was specifically designed to provide additional protection for vehicle occupants. However, assessing the overall level of protection that vehicles need to provide is complex. As noted above, the protection a TWV provides is vital in some circumstances but much less important in others. However, U.S. forces generally do not get to

²⁰² GAO-10-155T, 14.

choose the theaters or the circumstances of their operations. Thus, choices of how to equip forces must account for these uncertainties. The next section continues this discussion, examining several different options for retaining MRAPs in light of their capabilities and limitations.

MRAPs IN FUTURE ARMY FLEETS

As military operations in Iraq and subsequently Afghanistan approach an end, the military services face the challenging issue of developing a management policy for the MRAP fleet purchased for these operations. The DOD and the military services developed the MRAP family very rapidly to meet urgent operational needs based on niche challenges in diverse theaters, using wartime appropriations to resource the program. Now, the services must determine their approach for retaining these vehicles.

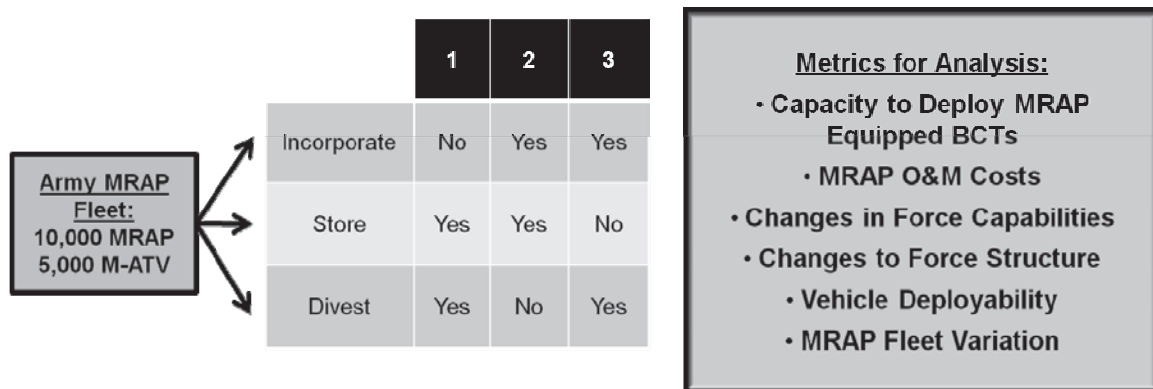
Decisions regarding how to manage equipment acquired during operations in a post-conflict situation are not a new challenge. Spending to acquire new equipment was significant during prior conflicts that lasted multiple years. However, the MRAP family of vehicles presents a unique challenge in that it provides the services with a new non-standard capability that U.S. forces needed during recent operations, but the requirement for MRAPs in future operations is uncertain. The uncertainties about the need for MRAPs during future operations along with their operational limitations make identifying an ideal place in the current force structures difficult. Additionally, the large variety of MRAP types further confounds this issue. This section explores how the Army may manage its MRAP fleet, presenting and comparing three options, highlighted in Figure 7.1.²⁰³ The following section examines MRAP options discussed in recent Army documents.

The different options include decisions about whether to incorporate MRAPs in the force structure, store them in permanent

²⁰³ This section does not consider Category III MRAPs used by engineer units for route clearance and explosive ordnance disposal because they do not compose a large portion of the fleet.

storage facilities for use in future operations, or divest of the platforms. The discussion of each option includes estimates of how many vehicles BCTs and some support elements require during operations. The three options include: one that seeks to minimize future costs; one that integrates MRAPs into the permanent force structure of BCTs; and one that incorporates full BCT sets of MRAPs using ARFORGEN to equip units for their most likely mission type. These options were selected as representative of the full range of viable options.

Figure 7.1
MRAP Retention Options



To evaluate the relative merits of each option, this analysis compares them across several different performance metrics. First, it examines how each option affects the Army's capacity for deploying MRAP equipped BCTs. The analysis then estimates the future O&M costs to the Army's base budget and how an option may change the capabilities and force structure of a BCT. Finally, the study considers the percentage of MRAPs available for deployment as well as the overall MRAP fleet variation within the Army.

Option 1: Minimize Future Cost Impacts of the MRAP Fleet

Integrating MRAPs into the Army's force structure will introduce additional O&M costs that the Army should seek to minimize consistent with operational priorities. To do this, Option 1 does not incorporate MRAPs into the Army force structure, stores a limited number of MRAPs in APS for use during future contingency operations, and divests of the

rest of the fleet. This approach assumes that, while important for recent operations, the capabilities provided by MRAPs are not generally needed during expected operations in the future. Thus, the MRAPs that have the broadest utility are retained, but stored rather than issued to units in order to minimize O&M costs.

There are two MRAP variants that appear to present the greatest future utility for the Army under these circumstances. The M-ATV provides the most flexibility for application in a variety of theaters and fills several of the TWV roles identified above. Also, with about 5,000 vehicles on hand, the Army has more M-ATVs than any of the other MRAP variants. Additionally, the Army would retain the MaxxPro Dash under this option since it is also able to operate in austere environments and has greater ability to carry passengers and cargo than the M-ATV. It serves as a complement to the M-ATV because it is better suited for infantry transport and logistics purposes. The Army currently has about 1,800 MaxxPro Dashes on hand so in total, Option 1 retains about 6,800 MRAPs in storage.

While the goal for this option is to minimize the impact of MRAPs on future budgets, not to equip a specific force for a future contingency, the question remains about what type of force could be equipped with the 6,800 MRAPs retained under this option. This question is analyzed with a set of rules that allocates MRAPs to combat and support forces based on the structures of Infantry Brigade Combat Teams (IBCTs) and Heavy Brigade Combat Teams (HBCTs), described in greater detail in Appendix D.²⁰⁴ These rules allocate vehicles based on the number of combat arms personnel and the amounts and types of TWVs

²⁰⁴ This approach to estimating the size of forces that an MRAP fleet could equip is necessary for several reasons. As discussed in the previous chapter, the DOD acquired MRAPs to enhance the protection provided by its TWV fleet; while officials mentioned replacing HMMWVs with MRAPs in combat theaters at various times, there was not an explicit MRAP model identified as a one for one replacement of a particular vehicle type. Additionally units operating in Iraq and Afghanistan used more TWVs than generally allocated in a unit's MTOE order to enhance their mobility; thus, simply allocating the number of vehicles in their current MTOEs would not provide sufficient capability.

assigned to BCTs. The rules also augment supporting elements in IBCTs and HBCTs with MRAPs useful for convoy security and logistics operations. The 6,800 MRAPs retained under this option provide enough vehicles to equip a deployed force of about 7 to 9 BCTs; roughly the size of the Army's forces in Afghanistan in 2010 or about half of the Army's forces in Iraq at the height of the surge. Retaining 6,800 MRAPs in storage would add about \$12 million (2011) to the Army's annual O&M budget.²⁰⁵

Option 1 allows the Army to retain the MRAP's important protection capability at a relatively small cost. However, there are risks associated with this option. 6,800 MRAPs would not allow the Army to equip a force as large as those deployed throughout operations to Iraq and Afghanistan should such scenarios reoccur. Moreover, future deployments may be even larger. On the other hand, 7 to 9 BCTs still represents a robust force and is larger than the forces the Army deployed during stability operations during the 1990s.²⁰⁶

This option may also introduce training risks since keeping the MRAP fleet only in storage would reduce familiarity with the equipment, potentially leading to safety and maintenance problems when equipping units during future deployments. The Army can mitigate this risk by making some of the vehicles available for training. For example, the 2011 Army Budget requests funds to sustain 185 MRAPs at Combat Training Centers (CTCs) to allow for training in "the contemporary operating environment faced by soldiers."²⁰⁷

This option also represents a different method for maintaining a capability than the Army typically uses, which seeks to integrate new capabilities throughout the applicable parts of the force structure. APS

²⁰⁵ Appendix E describes the approach and data used to calculate future O&M costs.

²⁰⁶ According to data collected from the DOD Statistical Information Analysis Division, the force deployed to the Balkans peaked during 1996 with about 26,000 service members. This is about the size of three to four modular BCTs with supporting forces.

²⁰⁷ U.S. Department of the Army, *Fiscal 2011 Budget Estimates Volume 1: Operation and Maintenance Army*, February 2010, 81 - 86.

are equipment sets in storage that are usually used to more rapidly deploy a force that is already trained using similar systems; for example, an HBCT using APS equipment receives an equipment set that is nearly equivalent to what it has at its home station.²⁰⁸

Option 2: Permanently Allocate Some MRAPs to Brigades

Option 2 integrates substantial numbers of MRAPs into the Army's current force structure, but also stores some MRAPs for future contingencies. The Army retains about 15,000 MRAPs under this option. It is similar to an option discussed by Feickert (2010), who reported that an Army briefing described plans that would allocate about 7,400 MRAPs to BCTs and another 5,400 to support units.²⁰⁹ This option has several advantages over Option 1. Permanent MRAP presence in the force structure provides organizations with more opportunity to train using MRAPs. Additionally, including MRAPs as part of the basic force structure ensures that MRAPs will be deployed during future operations. This has the potential to reduce service members' vulnerability to some threats in future operations. Finally, including MRAPs in the force structure also requires the establishment of a permanent line of replacement parts, which would be immediately available during contingencies, but would also result in higher overall operating costs. On the other hand, providing BCTs with MRAPs in their MTOEs also reduces the proportion of MRAPs available for deployment since some will be assigned to units who are in earlier phases of the ARFORGEN cycle.²¹⁰

When incorporating MRAPs into the force structures of BCTs, the Army would need to consider whether to substitute MRAPs for other

²⁰⁸ Maintaining a capability in storage is not without precedent. The Army currently maintains some equipment and supplies in APS that are useful for very specific missions. Under this option, MRAPs would become a tailored set of equipment for use during IW operations.

²⁰⁹ Feickert, August 24, 2010, 2.

²¹⁰ ARFORGEN is a rotational readiness cycle the Army currently uses to ensure a consistent supply of forces that are prepared to deploy.

vehicles or simply augment current force structures. This section considers the implications of both of these methods.

Option 2a - Allocate MRAPs to MTOEs as Substitutes

In allocating vehicles to the MTOEs of BCTs, the Army may choose to substitute them for other vehicles. If the Army chooses this option, then it faces some issues regarding how well MRAPs substitute for vehicles that are currently in the fleet. Aside from the M-ATV and MaxxPro Dash, the Army's MRAPs have reduced utility in the most austere environments, and substituting MRAPs for UAHs or FMTVs may reduce BCTs' overall mobility, especially in areas with poorly developed infrastructure. Thus, it is necessary to consider the limitations that MRAPs may introduce to the fleet when considering this option.

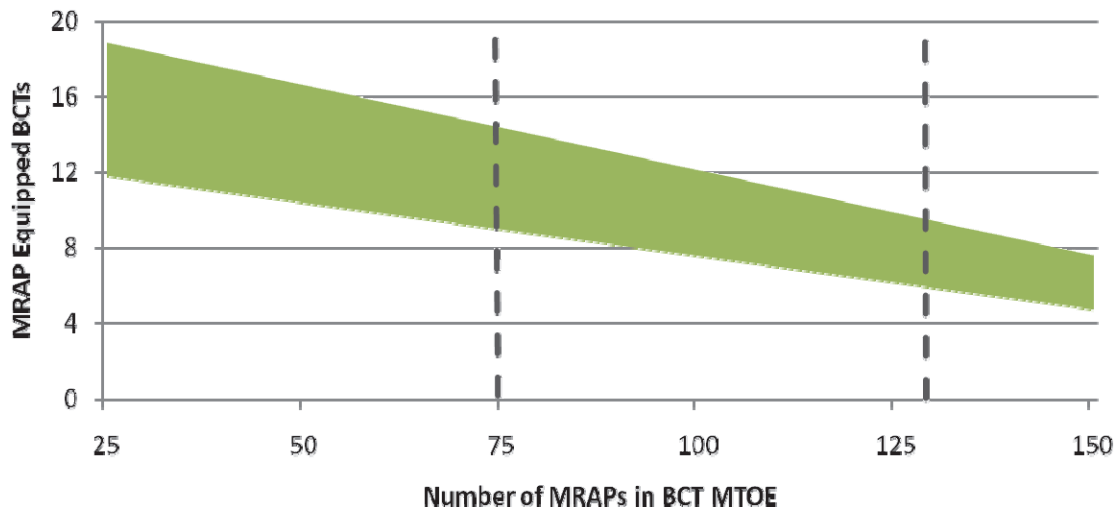
The Army may choose to target specific vehicles for allocation in BCTs' MTOEs. For example, Army leadership may choose to replace UAH Armament Carriers with M-ATVs. Armament carriers are often used by reconnaissance or heavy weapons organizations within a BCT. They typically carry a crew of about five personnel and need to be able to traverse difficult terrain. M-ATVs are able to fill roles similar to armament carriers as they have similar crew sizes and capabilities. It is also unlikely that other MRAP variants are versatile enough to substitute for these vehicles. M-ATVs have some advantages over UAHs in this role as they are more heavily armored, carry larger payloads and can generate more power. These characteristics improve the crews' protection, potentially allow them to operate without resupply for longer periods of time, and enhance their ability to communicate. However, M-ATVs are also over two feet taller, four feet longer, and slightly wider than a UAH. An M-ATV's turning radius is also twice as long, limiting the places they can go on the battlefield and making it more difficult to conceal their position, thus potentially increasing their vulnerability to attack. If Army leaders decided to substitute all of the UAH Armament Carriers in BCTs with M-ATVs they would need to allocate about 75 M-ATVs per BCT, taking nearly the entire M-ATV fleet.

Under this option, the total number of vehicles in BCTs' MTOEs remains the same even as they gain the additional armored protection

provided by MRAPs. Since the number of vehicles remains the same, this option does not likely change the current force structure in terms of personnel nor does it introduce major maintenance challenges. However, this option does introduce potential operational limitations that would increase risks in a BCT's ability to conduct operations in areas with austere infrastructure and may inhibit the ability to conduct some tactical tasks.

The analysis of this option allows the number of MRAPs placed in BCT MTOEs to vary and examines how that affects the deployment capacity of MRAP-equipped BCTs and the future costs of the MRAP fleet. Figure 7.2 depicts the Army's capacity to deploy MRAP equipped BCTs based on the number of MRAPs it allocates in a BCT's MTOE. As the Army allocates more MRAPs to the MTOEs of its BCTs, the overall deployment capacity of MRAP-equipped BCTs decreases, since a deploying BCT requires augmentation with additional MRAPs. The numbers of MRAPs in storage remains very important under this option as these vehicles provide the additional TWV capacity that organizations will need during deployment.

Figure 7.2
Capacity for Equipping Deployed BCTs with MRAPs Based on the Number of MRAPs in an Individual BCT's MTOE



The dashed bars in Figure 7.2 represent the potential range for MRAP substitution. As described above, if the Army substitutes M-ATVs

for UAH Weapons Carriers, it would need to add about 75 M-ATVs per BCT MTOE. On the other hand, if the Army adds more than about 130 MRAPs to each BCT's MTOE, then it retains less deployment capacity for MRAP-equipped BCTs than it did for Option 1.

The annual O&M costs for this option vary from about \$46 to 60 million depending on how many MRAPs the Army allocates to MTOEs and how many it stores. This option provides permanent MRAP capability to BCTs at a high cost relative to Option 1 since the Army still needs to retain many more MRAPs in permanent storage in order to maintain a high deployment capacity. In other words, under Option 2a the Army will always have many MRAPs assigned to units that are not immediately available for deployment, making this option less efficient in terms of MRAP availability than Option 1.

Option 2b - Augment BCT MTOEs with MRAPs

When adding MRAPs to BCTs' MTOEs, the alternative to substituting MRAPs for vehicles in the fleet is to augment current BCT fleets with additional MRAPs. Adding MRAPs in this way has different benefits and drawbacks. In Option 2a, an MRAP introduced into the force structure added a new set of capabilities and limitations to the fleet; the example of substituting the M-ATV for UAH Armament Carriers highlighted this issue. By simply adding new vehicles to the fleet, a BCT does not trade its current capabilities but only adds new ones. This presents commanders with some additional flexibility during combat operations, potentially allowing them to select the best variant from among a set of vehicles for a given mission. Considering the M-ATV/UAH Armament Carrier example above, Option 2b would provide a commander with the option to use M-ATVs if additional protection or power were very important or to use UAHs if concealment and mobility were more important.

On the other hand, this option may significantly alter the structure of IBCTs and HBCTs. Since these organizations receive additional vehicles, additional manning, training, and maintenance burdens are introduced. The Army would need to consider assigning additional personnel to BCTs to provide crews for these vehicles; without additional personnel, BCT commanders would need to determine

what part of the organization maintains and operates the additional vehicles. BCTs would also need to identify and train vehicle crews, reducing their availability for other training.

The Army's MRAP-equipped BCT deployment capacity and the efficiency of using MRAPs for this option are exactly the same as they were in Option 2a. However, the costs are higher since all of the original vehicles in the MTOE are retained. The annual O&M costs of Option 2b range from \$62 to 87 million depending on how many vehicles are added to MTOEs.

Option 3: Integrate MRAP Sets into Readiness Cycle

Instead of storing a limited number of MRAPs or allocating some into the permanent force structures of BCTs, the Army may choose to integrate its MRAP fleet into the ARFORGEN cycle as well as its force structure. Under Option 3, the Army would incorporate its MRAP fleet through the development of alternative MRAP equipment sets for BCTs, not store MRAPs in permanent storage facilities, and divest of some MRAPs to limit the fleet variability. The analysis for this option assumes the Army retains its Navistar MaxxPro and Oshkosh M-ATV variants, totaling about 11,000 vehicles, since these are the most numerous and flexible MRAP variants. The Army would distribute these vehicles based on the ARFORGEN cycle to provide units with the MRAPs necessary to complete their expected operational missions.

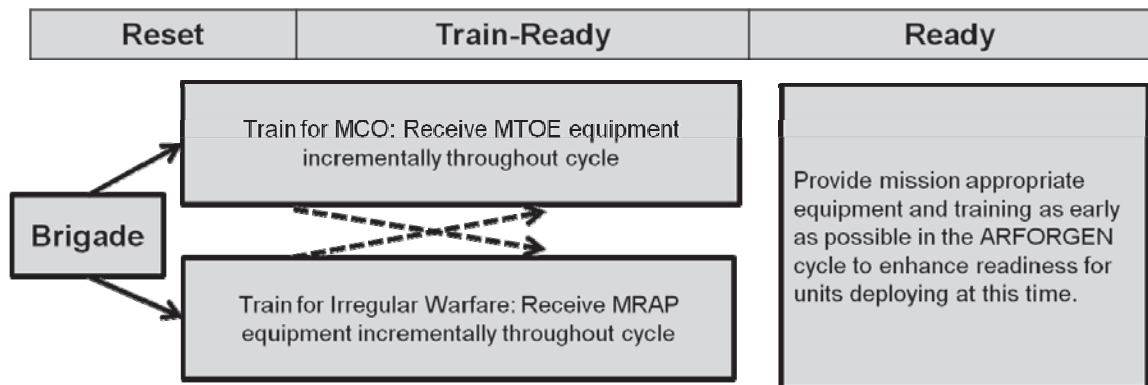
In a report to Congress in February 2010, the Army explained that it is "considering a plan to allocate over 9,000 [MRAP] vehicles in 20 task-organized Brigade Combat Team sets" which it would then place in APS.²¹¹ If the Army chose to follow Option 3, it would use alternate MRAP equipment sets, like those described above, to equip IBCTs and HBCTs along with their supporting forces specifically for expected operations as they rotate through ARFORGEN. This represents a significant change in the way the Army manages equipment and training

²¹¹ U.S. Department of the Army, *Army Truck Program (Tactical Wheeled Vehicle Acquisition Strategy) Report to the Congress*, Washington D.C: Department of the Army, June 2010, 23.

since multiple equipment sets would be available for BCTs. However, the Army may find this type of change desirable since MTOE equipment was not sufficient for the types of operations and threats faced in Iraq and Afghanistan.

The regular MTOE equipment proved sufficient for the initial stages of OIF, but as operations evolved towards IW and enemy organizations developed better weapons and tactics, the vehicles needed for operations changed. Retaining MRAPs, in the way described above, to create alternate fleets (distributed to units based on their position in the ARFORGEN cycle) would allow the Army to address this equipment challenge in a more flexible way. The Army would retain the necessary MTOE equipment for all of its BCTs while being able to deploy a certain percentage of the ARFORGEN Ready Pool in an MRAP-equipped configuration for IW operations. The rationale follows largely from the Army Equipping Strategy, which explains that the Army should equip units for their expected mission, receiving equipment increments as they rotate through the ARFORGEN cycle.²¹² Figure 7.3 highlights the concept for this option.

Figure 7.3
Alternative Equipment Sets for an Army Brigade



²¹² U.S. Department of the Army, *Army Equipping Strategy*, Washington, DC: Department of the Army, 2009, 3.

Under this option, the Army may choose the appropriate equipment set for a unit during the earlier phases of ARFORGEN allowing that unit to train for its expected mission. A brigade would receive its normal MTOE equipment when preparing for major combat operations, or it would receive an MRAP equipment set if preparing for IW operations like those in Iraq and Afghanistan. At any time during ARFORGEN, Army planners could determine whether the expected operations for a unit had changed and alter the equipment sets provided. Unallocated MRAPs would be kept in temporary storage facilities until needed. Thus, this option goes beyond the simple question of MRAP retention and introduces an entirely new equipping scheme that increases operational flexibility for BCTs, providing equipment and allowing them to train specifically for their expected operational tasking. However, it also increases the burdens of managing and equipping units as Army planners must make decisions about how to equip units throughout the ARFORGEN cycle.

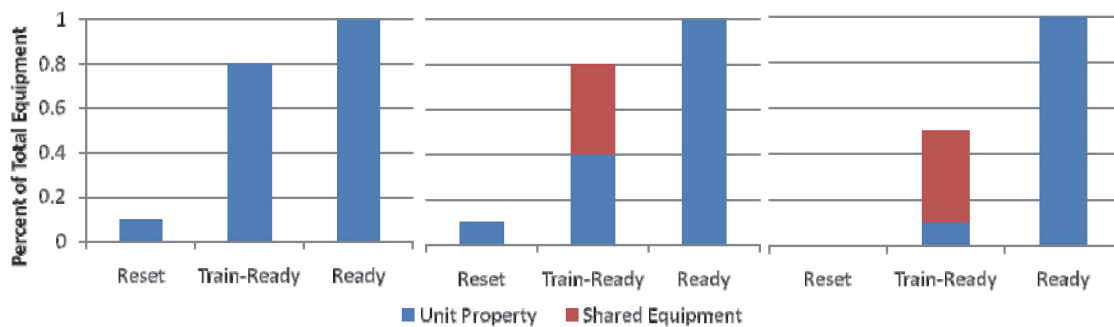
There are multiple ways that the Army may manage its MRAP fleet under this option, by either assigning MRAPs to units throughout the ARFORGEN cycle or utilizing shared training sets. Recently, Lewis et al. (2010) recommended that Combat Support Hospitals (CSHs) utilize shared equipment sets so the Army could "reduce the cost of equipping and maintaining its CSHs at fully modernized levels."²¹³ Option 3 envisions the potential for equipment sharing not to reduce costs but to improve the Army's ability to deploy ready BCTs. However, deployment demands will determine the Army's ability to equip organizations with MRAPs in the early phases of ARFORGEN.

During times when there is a low demand for deploying MRAP-equipped BCTs, the Army could assign more MRAPs to units, while in times when deployment demands are high, the Army would assign very few MRAPs to BCTs, but utilize shared MRAP training sets located at CTCs. The size of these sets may even be reduced to deploy greater numbers of MRAPs. Figure 7.4 highlights the range of fleet management techniques modeled

²¹³ Lewis, Matthew W. et al., *New Equipping Strategies for Combat Support Hospitals*, MG-887-A, Santa Monica, CA: RAND Corporation, 2010, 62.

for this analysis. The graph on the far left represents times when the deployment demand is low and the Army assigns units larger numbers of MRAPs throughout the ARFORGEN cycle. The middle chart depicts the introduction of shared equipment sets when deployment demands rise, and the chart on the far right highlights how the Army would manage its MRAP fleet when demands for deployed units are even higher. These alternative methods for managing the MRAP fleet ensure that most MRAPs are available for use during deployment, but also mean that when deployment demands are highest, Army organizations receive the least amount of training on the types of equipment they will use during deployments.

Figure 7.4
Fleet Management Techniques



The Army's ability to deploy MRAP equipped BCTs varies significantly, ranging from about 5 to 13 BCTs at a time, depending on the fleet management techniques represented in Figure 7.4, which follow from the demands the Army faces. Table 7.3 highlights the demand ranges and other details that result from using the different fleet management techniques described.

The annual O&M costs for this option are \$20 to 82 million, with a wide range of costs based on the number of organizations receiving MRAP equipment sets in the ARFORGEN phase. This option would cost about \$20 million per year if all MRAPs were in temporary storage or up to \$82 million when MRAPs were assigned to units, throughout the entire ARFORGEN cycle, that do not deploy.

Table 7.3
Deployment Demands Driving Fleet Management

No / Low Demand	Moderate Demand	High Demand
5 - 6 BCTs	6 - 8 BCTs	8 - 13 BCTs
MRAPs assigned throughout ARFORGEN	Fewer MRAPs with 2 shared sets at CTCs	Very few MRAPs with 2 limited shared sets
Better familiarity and readiness than other options	Fewer MRAPs assigned provide some familiarity	Limited training opportunities introduce risks

Overall, Option 3 increases the Army's ability to conduct full spectrum operations by allowing Army units the opportunity to receive and train on sets of equipment that are necessary for their expected deployment tasks. It also introduces new management burdens since Army planners must determine the appropriate equipment sets throughout the ARFORGEN cycle.

RECENT ARMY PLANS FOR MRAP RETENTION

During 2010, the Army released several potential plans for MRAP retention, some of which are fairly consistent with the options described above. However, none provided explicit detail about the underlying reasoning behind these plans. In a report to Congress in February 2010, the Army described a possible plan of allocation for MRAPs stating:

The Army is considering a plan to allocate over 9,000 vehicles in 20 task-organized Brigade Combat Team sets stored in Army Pre-Positioned Stocks (APS) and CONUS storage facilities, plus approximately 6,000 vehicles in Modification Tables of Organization and Equipment units, training, sustainment, and war reserve stocks.²¹⁴

The 2010 Army Modernization Strategy outlines a similar plan, explaining that the Army will develop "sets of MRAPs tailored to BCTs and available for their employment while in the available phase of the

²¹⁴ U.S. Department of the Army, *Army Truck Program (Tactical Wheeled Vehicle Acquisition Strategy) Report to the Congress*, Washington D.C: Department of the Army, June 2010, 23.

ARFORGEN cycle" and also mentions that MRAPs will be integrated into "select enabler units."²¹⁵ This section examines two additional options based on these discussions in Army documents.

Army Plans Option A

This option focuses on explicitly examining the implications of the Army's statement to Congress. The Army retains about 15,000 MRAPs, integrating 6,000 into support brigades' MTOEs while storing the remaining 9,000 in APS. Under this option, the current MTOE of BCTs does not change and, like Option 1, they have very little access to MRAPs for training throughout the ARFORGEN cycle. However, since the Army maintains 9,000 MRAPs in APS it is able to equip about 20 BCTs during a deployment.²¹⁶ MRAPs needed by support units are integrated into their MTOEs, so they will not receive additional MRAPs when deploying.

The annual O&M costs for this option are about \$51 to 70 million, and its advantage over Option 1 is that it provides the Army with the capacity to deploy up to 20 BCTs with their supporting units. Integrating MRAPs into support units' MTOEs potentially introduces new mobility limitations while increasing the armored protection provided by their usual fleets. Additionally, this option carries the same training and maintenance challenges for BCTs as described in Option 1, but the proportion of MRAPs deployable on demand is lower than Option 1 because 6,000 MRAPs are integrated into the MTOEs of support units. Since this option retains 15,000 MRAPs in total, the fleet variation remains high.

Army Plans Option B

Instead of simply storing the MRAPs that BCTs may require during a deployment, the Army may instead decide to follow a plan that is more like Option 3. Under Army Plans Option B, the Army would develop sets for BCTs and support units and use the ARFORGEN cycle to equip and train these organizations as needed. However, under this option the Army would

²¹⁵ U.S. Department of the Army, *2010 Army Modernization Strategy*, Washington, DC: Department of the Army, April 2010, 15

²¹⁶ The allocation model described in Appendix B estimates that about 9,500 MRAPs would be needed to equip 20 BCTs.

retain enough MRAPs to have the capacity to deploy 20 MRAP-equipped BCTs with supporting units. In order to maintain a deployment capacity of about 20 MRAP-equipped BCTs, the Army requires at least 16,700 total MRAPs. Thus, the Army would need to reconsider the decision to divest of its RG-33 models in order to retain enough MRAPs for such a high deployment capacity.²¹⁷

The annual O&M costs for this option would be about \$30 to 127 million in the absence of contingency operations. Although it is the highest cost option considered, it carries the fewest risks. It also offers the operational flexibility to train and equip organizations for their expected missions, like Option 3, with expanded capacity for future deployments. Under this option the Army could fully equip all BCTs in the Ready Phase of the ARFORGEN cycle with MRAPs. However, this option requires the most MRAPs of any option leading to extremely high fleet variation or the need to procure additional MRAPs if the Army wishes to reduce the variation in the MRAP fleet.

COMPARING MRAP RETENTION OPTIONS

Each of the options described above has different advantages and disadvantages. Table 7.4 highlights each option's performance across the different metrics considered. Of the options developed for this study, Options 1 and 3 dominate Option 2 in terms of costs, vehicle deployability, and fleet variation. Meanwhile, Option 3 provides much greater operational flexibility than any of the other options since it provides a mechanism for the Army to train and equip forces for either traditional or IW operations. The two options based on discussions of current Army plans have similarities with the other options with the exception that the Army is able to deploy up to 20 MRAP-equipped BCTs with supporting forces. Retaining a higher capacity leads to increased costs and greater fleet variation.

²¹⁷ Bertuca, Tony, "Army Wants to Divest 1,500 MRAPs; Two Variants," *InsideDefense.com*, January 27, 2011.

Table 7.4
Comparison of MRAP Retention Options (2011 \$)

	MRAPs Retained	O&M Costs	Deployment Capacity	Changes in Force Capability	Changes to Force Structure	% Deployable on Demand	Fleet Variation
Option 1	6,800	\$12M	6-9 BCTs	Potential training and maintenance challenges	Unchanged	~100%	Low
Option 2a	15,000	\$46-60M	6-14 BCTs	New capabilities and limitations	Unchanged	60 -77%	High
Option 2b	15,000	\$62-87M	6-14 BCTs	New capabilities and flexibility	Significant change: manning, training, and maintenance	60-77%	High
Option 3	11,000	\$20-82M	Up to 13 BCTs	Ability to tailor training and equipment	Unchanged	Up to 87%	Moderate
Army Plan A	15,000	\$51-70M	20 BCTs	BCTs: Training and maintenance challenges Supt: Capabilities and limitations	Unchanged	~71%	High
Army Plan B	16,700	\$30-127M	20 BCTs	Ability to tailor training and equipment	Unchanged	Up to 87%	Very High

Since no one option clearly dominates across each of the different performance metrics considered, I used a portfolio analysis tool to aid in the analysis of the various courses of action.²¹⁸ Table 7.5 highlights the outcome of applying this tool assuming that each performance metric is weighted equally. In order to assess each of the options, Options 2a and 2b were further divided based on the number of MRAPs inserted into the force structure. Options 2a and 2b - Low insert 75 MRAPs in the BCT MTOEs and Options 2a and 2b - High insert 130 MRAPs

²¹⁸ RAND's Portfolio Analysis Tool (PAT) was used to complete this part of the analysis. PAT is a "tool for comparing investment options according to a number of quantitative and qualitative criteria, including costs, upside potential and downside potential (risk)," providing the means for "weighing various objectives and priorities and assessing options' adequacy in meeting them." PAT provides a means for scoring an option across each performance metric then uses a linear weighted sum to determine an option's overall score. See Davis, Paul K. and Paul Dreyer, *RAND's Portfolio Analysis Tool (PAT): Theory, Methods, and Reference Manual*, TR-756-OSD, Santa Monica, CA: RAND Corporation, 2009.

in BCT MTOEs. They were divided in this way since some of the metrics vary based on the number of MRAPs allocated to BCTs. Army Plan A was also divided into two options depending on whether the Army uses substitution or augments fleets with MRAPs.

Table 7.5
Assessment of MRAP Retention Options

	Deployment Capacity	Force Capability	Force Structure	Deployable on Demand	Fleet Variation	Effectiveness
Option 1	Y	O	G	G	G	0.77
Option 2a - Low	LG	R	G	LG	O	0.51
Option 2a - High	Y	R	G	O	O	0.38
Option 2b - Low	LG	LG	R	LG	O	0.47
Option 2b - High	Y	G	R	O	O	0.35
Option 3	LG	G	G	G	G	0.87
Army Plan A - Substitute	G	R	G	LG	O	0.57
Army Plan A - Augment	G	LG	G	LG	O	0.7
Army Plan B	G	G	G	G	R	0.74

Notes: The letters within each of the boxes simply represent the color of the box: G - Green, LG - Light Green, Y - Yellow, O - Orange, and R-Red. The scores within each box may be as high as one (Green) to as low as zero (Red).

When all of the metrics are weighted equally, Option 3 is the recommended choice. This option performs well across each of the performance metrics, whereas each of the other options has at least one obvious weakness. Option 1 has the second highest effectiveness score, but it performs poorly on force capability and provides a low deployment capacity. Army Plan B does well across all of the metrics except for fleet variation since it requires more MRAP models than the Army is currently planning to retain.

The portfolio analysis tool also allows for sensitivity analysis through reweighting the importance of the performance metrics. This provides the opportunity to consider multiple decision making perspectives. For example, a decision maker may not worry much about the

effects of having an extremely varied fleet and may thus wish to reduce the emphasis on fleet variation. As noted above, when all weights are equal, Option 1 had the second highest effectiveness score. Option 1 only overtakes Option 3 if deployability is reweighted to more than four times higher than the other factors, or if the emphasis on force capability is 1/20 of the other metrics. Since these large changes in valuing these metrics are unlikely, Option 3 is very robust against Option 1. However, Option 3 is somewhat more sensitive to Army Plan B if the valuation for deployment capacity increases or fleet variation decreases. Army Plan B would be on par with Option 3 if the valuation of deployment capacity increases by three times. On the other hand, Army Plan B could also attain the same effectiveness score if the valuation for fleet variation decreases by 1/3. Army Plan B overtakes Option 3 more easily if these valuations change simultaneously.

Sensitivity analysis reveals that Option 3 is fairly insensitive to changes in the weights on the performance metrics. However, Army Plan B is the most likely alternative to overtake Option 3. These two alternatives are very similar in the way that MRAPs are managed, differing only in the number of MRAPs retained. Therefore, I conclude that the Army should pursue Option 3, integrating MRAPs into the force structure and ARFORGEN cycle, but may choose to retain more than the 11,000 included in the analysis of Option 3 to increase its capacity to deploy MRAP equipped BCTs. Army decision makers could also choose to pursue Option 1, determining that it provides a sufficient level of effectiveness at lower cost, should they face greatly constrained budgets or the likelihood of IW operations diminishes in the future.

RETAINING MRAPs FOR THE FUTURE

The *Army Tactical Wheeled Investment Strategy* exclaims that "MRAPs are here to stay."²¹⁹ The DOD developed the MRAP fleet as a way to improve the protection of service members during tumultuous times as

²¹⁹ U.S. Department of the Army, *The Army Tactical Wheeled Vehicle Investment Strategy*, Washington, DC: Department of the Army, October 2009, 4.

U.S. military forces were engaged in conflicts in Iraq and Afghanistan facing unanticipated enemy tactics. Over the course of about three years, a large family of heavily armored vehicles emerged due to generous amounts of money appropriated to the program. Over this same time, the perception of MRAPs changed from simply being an augmentation for existing TWV fleets to largely replacing UAHs during combat operations, and leading to interest in what MRAPs mean for the future. Even after recognizing the longevity of this family of vehicles, questions remain about how they really fit within the Army's future vehicle fleets.

While MRAPs are generally able to fill the roles of existing vehicle fleets, they introduce operational liabilities that may hinder some types of operations. MRAPs' size and weight limit mobility, so substituting MRAPs into the fleet may actually increase vulnerability to attack in some situations, while also increasing sustainment costs. Furthermore, the protection provided by MRAPs will not be needed during every potential operation in the future. However, the Army cannot choose its operations based on the types of equipment it has on hand or prefers to operate. Additionally, these vehicles are quite valuable during IW operations in non-permissive environments. This raises the issue about how many MRAPs the Army should retain and whether this capability should be integrated or kept in storage.

The analysis presented in this chapter highlights several potential options for Army MRAP management and concludes that MRAP capability should be kept and integrated into the force and the ARFORGEN readiness cycle while the threat of IW operations persists and the budget permits. This concept calls for a significant change in the way that the Army equips and trains brigades and introduces new management burdens, but overall it increases operational flexibility by preparing full spectrum organizations for the types of operations the Army expects them to conduct.

The analysis in this chapter estimates that the Army may potentially deploy up to 13 MRAP-equipped BCTs if it retains 11,000 MRAPs and integrates them into the ARFORGEN cycle, though Army leaders may opt for a higher total deployment capacity by retaining more than

11,000 MRAPs. For example a deployment capacity of 20 BCTs would require more than 16,700 MRAPs, increasing the overall costs and fleet variation.

If the probability of conducting IW operations diminishes in the future or the Army budget drastically decreases, the Army may decide not to integrate MRAPs into the force structure and ARFORGEN cycle since MRAPs provide little utility over current vehicles in many environments, are potentially limiting during major combat operations, and cost far more to operate than lighter TWVs. MRAPs should be stored as an element of APS if there are few worries about IW operations and budgetary pressures increase. Storage in APS retains the niche capability provided by MRAPs as a hedge against unforeseen threats during future operations, but does so at a relatively low cost.

8. BUYING MILITARY INTERVENTION IN THE FUTURE

The U.S. government's current plans call for the end of military operations in Iraq and Afghanistan around 2015. However, that does not spell the end of U.S. military intervention for the future. Thus, it is important to consider the budgetary difficulties experienced during recent operations along with potential budget policy options that exist for future military operations. There are many new and lasting budgetary complications introduced from wartime budgetary policy since 2001. This chapter concludes the dissertation outlining these challenges and analyzing alternatives to mitigate these challenges during future contingencies.

The chapter begins by detailing the scope of these challenges, which range from issues related to financing operations within the federal budget to the potential for additional costs moving from wartime budgets into the military services' annual budgets. After highlighting these challenges, the chapter turns to an examination of various budgetary policies that the government could implement to mitigate some of these complications. It concludes with some recommendations for budgeting during future operations along with other policies that may reduce the degree of budgetary complications during protracted military operations.

BUDGETARY CHALLENGES EMERGING DURING RECENT MILITARY OPERATIONS

Several budgetary challenges materialized throughout the period of recent military operations. These difficulties have wide ranging implications across the overall federal government but most distinctly impact the DOD and the military services. This section details these budgetary challenges, highlighting the organizations affected along with their potential impacts. In total, there are seven notable budgetary complications related to recent wartime funding:

1. The administration vastly underestimated the costs of military operations in Iraq.

2. The supplemental appropriations process weakened the normal checks between executive and legislative participants.

3. Supplemental appropriations provided a convenient way to pass additional legislation that was often unrelated to the wars and politically contentious.

4. Participants in the executive and legislative branches used supplementals to introduce defense policy changes outside the normal process of making these changes.

5. Supplemental appropriations became a mechanism for augmenting the DOD's annual budget.

6. Wartime budgets likely lead to cost migrations that will increase the total claims in future annual budgets.

7. The DOD must make decisions on how to manage non-standard equipment as operations conclude.

Wartime Cost Forecasts²²⁰

The first budgetary challenge that emerged during recent operations originated with the administration's discussions about the expected costs prior to the Iraq campaign. Cost estimates from officials within the administration varied from less than \$50 billion to as high as \$200 billion. Lawrence Lindsey delivered the highest estimate in September 2002 noting that a war with Iraq would be relatively inexpensive costing "between 1 percent and 2 percent of U.S. GDP, or about [a] one-time cost of \$100 billion to \$200 billion."²²¹ The administration backed away from this estimate noting that it was too high; in December 2002, the New York Times noted that OMB Director Mitchell Daniels stated that a war

²²⁰ Unless otherwise stated, the cost estimates described in this section focus on the direct budgetary costs paid by the U.S. government during operations. Some discussions of the overall costs of the war also estimate the overall economic costs of military operations, which are higher.

²²¹ Davis, Bob, "Bush Economic Aid Says Cost of Iraq War May Top \$100 Billion," *Wall Street Journal*, September 16, 2002.

with Iraq "could be in the range of \$50 billion to \$60 billion."²²² Later, the White House shied away from delivering any official estimates, stating that "it is impossible to estimate how much a war with Iraq would cost until President Bush orders military action."²²³ Days later, Secretary of Defense Donald Rumsfeld noted in an interview that the OMB estimate was less than \$50 billion.²²⁴

There were some other notable war cost forecasts published in September 2002 from outside the administration. The CBO prepared an estimate of the potential costs of military operations in Iraq during different phases of the operation. The CBO (2002) estimated that deploying forces to theater would cost \$9 to 13 billion, "prosecuting a war would cost" \$6 - 9 billion per month, occupation operations would cost \$1 - 4 billion per month, and redeploying forces back to the U.S. would cost \$5 - 7 billion.²²⁵ The CBO also described a high degree of uncertainty in delivering a cost estimate, explaining that "unknown factors abound in considering how a conflict with Iraq would actually unfold."²²⁶

The Democratic Staff of the House Budget Committee developed a set of estimates that used the 1991 Gulf War as an example, predicting that a potential war with Iraq could cost \$48 to 60 billion with an additional \$27 to 33 billion in interest costs.²²⁷ The Budget Committee's report assumed that "U.S. forces would remain at or near

²²² Bumiller, Elisabeth, "Threats and Responses: The Cost; White House Cuts Estimate of Cost of War with Iraq," *New York Times*, December 30, 2002.

²²³ McQuillan, Laurence, "White House Can't Say How Much a New Iraq War Would Cost," *USA Today*, January 16, 2003.

²²⁴ Hormats, Robert D., *The Price of Liberty: Paying for America's Wars from the Revolution to the War on Terror*, New York: Henry Holt and Company, 2007, 263.

²²⁵ Congressional Budget Office, *Estimated Costs of a Potential Conflict with Iraq*, Washington DC: Congressional Budget Office, September 30, 2002, 1.

²²⁶ Ibid., 6.

²²⁷ House Budget Committee, Democratic Staff, *Assessing the Cost of Military Action Against Iraq: Using Desert Shield/Desert Storm as a Basis for Estimates*, Washington DC: House Budget Committee, September 23, 2002, 2.

full strength in Iraq for two and one-half months after the conflict," noting that the costs would be far higher if large numbers of forces remained in Iraq for a long period of time.²²⁸ A comparison of the CBO and House Budget Committee's analyses yielded similar results, namely "a short and successful war would be around \$50 billion."²²⁹

Finally, Nordhaus (2002) estimated the cost of a war with Iraq, highlighting both the potential budgetary and economic costs. Table 8.1 highlights the results of this analysis.

Table 8.1
Nordhaus Iraq War Cost Estimates (billions of 2002 \$)

Source of Cost	Low (short war)	High (protracted war)
Direct Military Spending	50	140
Follow-on Costs		
Occupation and Peacekeeping	75	500
Reconstruction and Nation-Building	30	105
Humanitarian Assistance	1	10
Impact on Oil Markets	-40	778
Macroeconomic Impact	-17	391
Total	\$99	\$1,924

Source: Reproduced from Nordhaus, William D., "The Economic Consequences of a War with Iraq," in Kaysen, Carl et al. al., *War with Iraq: Costs, Consequences and Alternatives*, Cambridge, MA: American Academy of Arts and Sciences, 2002, 77.

Nordhaus did not limit the analysis by assuming only short war scenarios, but instead developed a range of potential outcomes that included both a short operation and a roughly decade long nation building scenario.²³⁰ Nordhaus estimated that the direct cost of a short war could be about \$156 billion while a longer war would cost about \$755

²²⁸ Ibid., 3-4.

²²⁹ Nordhaus, William D., "The Economic Consequences of a War with Iraq," in Kaysen, Carl et al. al., *War with Iraq: Costs, Consequences and Alternatives*, Cambridge, MA: American Academy of Arts and Sciences, 2002., 62.

²³⁰ Ibid., 66.

billion over ten years, not including the estimated impact on oil markets and macroeconomic impact shown in the table.²³¹

To summarize, cost estimates from administration officials, assuming operations in Iraq would be short and relatively easy, largely agreed with estimates delivered by the CBO and the Democratic Staff of the House Budget Committee. A short war was expected to cost \$50 to \$200 billion. In retrospect, these estimates were far lower than the actual costs of the war in Iraq. The Congressional Research Service (2011) estimates that of the \$1.283 trillion appropriated for military operations since 2001, the Iraq war cost about \$806 billion.²³² Thus, through 2011, the Iraq war cost between 4 and 16 times more than originally predicted. Meanwhile, the pessimistic estimate reported by Nordhaus proved to be far closer to the actual costs over time. It is not unusual for officials to largely underestimate the costs of a war prior to its beginning. Hormats (2007) stated,

The Bush administration, of course, was not unique in underestimating war costs. History demonstrates the difficulty most administrations have in determining the cost and duration of a war at its outset. In virtually every case, military spending has been far greater than originally anticipated. But the administration should have been aware of the oil problem and learned from the mistakes of its predecessors about the unpredictability of early wartime spending projections rather than dismissing those who offered higher cost estimates.²³³

There are several potential reasons why an administration might struggle to provide accurate estimates for pending military operations, as seen prior to operations in Iraq. The first is that there is often a large degree of uncertainty regarding both the duration and the intensity of a potential military campaign. Additionally, an administration that is actively pursuing public support for a desired operation will highlight optimistic estimates. However, the promotion of a belief that costs would be low may lead to some acute problems.

²³¹ Ibid., 77.

²³² Belasco, Amy, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11*, CRS Report RL33110, Washington DC: Congressional Research Service, March 29, 2011, 1.

²³³ Hormats, 265.

The most important challenge that originates from underestimating the costs of potential military operations is that the administration develops insufficient plans for financing the operations. Thus, an administration may not do enough to ensure federal resources are appropriately directed towards the war effort. In the case of recent military operations, Hormats noted that "the American people were assured that the cost would be low, and no reassessment or resource reallocation took place."²³⁴ The administration, assuming costs would be low, did not seek to offset the potential costs of military operations with other reductions in spending or through increasing revenues.²³⁵ Table 8.2 highlights this impact displaying annual revenue, defense spending, DOD wartime appropriations, and the federal deficit from 2001 through 2010.

Table 8.2
Supplemental Impacts on Federal Deficit (Current \$ billions)

<u>Year</u>	<u>Federal Receipts</u>	<u>DOD Outlays</u>	<u>War Funding</u>	<u>Total Outlays</u>	<u>Surplus / Deficit</u>
2001	1,991	290	14	1,863	128
2002	1,853	332	17	2,011	-158 (11%)
2003	1,782	389	62	2,160	-378 (17%)
2004	1,880	437	65	2,293	-413 (16%)
2005	2,154	474	101	2,472	-318 (32%)
2006	2,407	499	116	2,655	-248 (47%)
2007	2,568	529	169	2,729	-161 (>100%)
2008	2,524	595	190	2,983	-459 (42%)
2009	2,105	637	144	3,518	-1,413 (10%)
2010	2,163	667	160	3,456	-1,293 (12%)

Sources: U.S. Executive Office of the President, Office of Management and Budget, *Fiscal Year 2012 Budget of the United States Government*, "Historical Tables," Washington, DC: Government Printing Office, 2011.

²³⁴ Ibid., 253.

²³⁵ Rubin, Irene, "Budgeting During the Bush Administration," *Public Budgeting and Finance*, Vol. 21, No. 3, Fall 2009, 1 - 14.

Table 8.2 indicates the portion of the annual deficit from wartime funding to the DOD. From 2004 through 2008, military operations significantly impacted the annual federal deficit; in 2007, wartime funding actually exceeded the federal deficit. While poor cost estimates prior to the Iraq war may have impacted the deficit for a few years after 2004, the administration made no attempt to offset war costs even as they became more predictable.²³⁶

Supplementals Weakened Checks among Government Participants

One important challenge that emerged during the period when supplemental appropriations were used as the primary mechanism to provide wartime resources is that when used over time, the supplemental appropriations process weakens the normal checks that exist between executive and legislative participants in the budgetary process. This impacted the influence that both branches have over the normal budget in different ways. In the supplemental appropriations process, Congress forfeits some oversight of appropriations and executive activities while the president exerts weakened veto power.

The supplemental appropriations process reduces the normal amount of Congressional oversight in two ways. First, since the president submits a request for supplemental appropriations during the year of execution, the Congressional authorization committees are left out of the process. Further, the time allocated for the passage of supplementals is far shorter than the amount of time devoted to the annual budget submission. From 2001 to 2009, the average time from request to signature of a wartime supplemental appropriations bill was about 72 days; individual bills took between 6 and 134 days to pass. On the other hand, Congress typically has about 8 months to pass the annual defense appropriations bill and often takes much longer. The Iraq Study Group Report (2006) highlighted this erosion in Congressional oversight

²³⁶ A simple regression analysis of the effect of supplemental appropriations on U.S. federal deficits indicated that about 20 percent of the variation in annual deficits since 1970 is explained by defense related supplemental appropriations.

noting that "the result is a spending bill that passes Congress with perfunctory review."²³⁷

Meanwhile, the supplemental appropriations process also reduces the president's ability to veto legislation. Once Congress passes a bill, the president has the opportunity to either sign the bill into law or veto it. During the normal appropriations process, if the president vetoes an appropriations bill or Congress fails to pass one by the start of the fiscal year, a continuing resolution is typically passed to provide government agencies with the resources needed to continue operating. In the supplemental appropriations process, there is no back-up like the continuing resolution to provide resources for military operations. Additionally, there is a high degree of uncertainty regarding the time it would take to pass another bill and what the subsequent bill may include if the president chooses to veto the supplemental passed by Congress. Thus, the president loses some of the leverage the veto provides in the normal appropriations process; this presents Congress with additional power to add other funding or legislation to supplemental appropriations bills. This weakened veto power, in part, leads to the next budgetary challenge identified in recent wartime appropriations bills, the addition of legislation which was often unrelated to the war and politically contentious.

Supplementals Are a Convenient Way to Pass Additional Legislation

From 2003 through 2009, supplemental appropriations provided a convenient mechanism to pass additional legislation. As noted above, the weakening of the normal checks in the legislative process offered an additional opportunity to add items to these bills. Additionally, wartime supplemental appropriations bills were treated with great urgency, essentially ensuring rapid passage through Congress. Figure 3.2 (in Chapter 3) highlighted some items included in wartime supplemental appropriations, indicating their relevance to ongoing operations along

²³⁷ The Iraq Study Group, 2006, 91.

with their potential for passage outside the supplemental appropriations process.

The additional provisions and appropriations added to wartime supplemental appropriations bills had a very broad impact; some directly affected operations but others had nothing to do with ongoing operations or even national security. Additionally, several provisions added to the supplementals were politically contentious. Some were struggling to pass as stand-alone bills or in other legislation due to direct presidential opposition or to high costs, or they were stalled in Senate procedures. The president vetoed only one supplemental appropriations bill, which included a timetable for withdrawal from Iraq. Otherwise, the urgency to pass wartime funding along with the weakened checks ensured that supplementals were a convenient tool to move otherwise troubled legislation.

Defense Policy Changes Were Introduced In Supplementals

Supplemental appropriations bills also proved to be a convenient place for both executive and legislative participants to introduce defense policy changes. Since the supplementals bypassed the authorizing committees, these policy changes circumvented the normal process for changing policy. Congress typically enacted these policy changes for a short period of time initially and made them permanent later. Table 8.3 highlights some of the policy changes introduced in supplemental appropriations bills.

Table 8.3
Policy Changes Introduced in Supplemental Appropriations Bills

Year	Provision	Initiator
2003	Incremental Deployment and Combat Pay	Congress
2004 - 2009	Increase in Army and MC End Strength	DOD
2004	Expansion of TRICARE for Reservists	Congress
2005	Increase in Life Insurance and Death Benefits	DOD
2008	New Education Benefits for Veterans	Congress

Source: Public Laws, DOD Requests, and *Congressional Quarterly Almanacs 2003-2007*.

Most of the defense related policy changes introduced in supplemental appropriations focused on increasing the benefits provided to service members, and as displayed above in Figure 3.2, some of these policy changes were contentious. The president threatened to veto the 2004 NDAA if it included a provision extending health insurance coverage to all members of the Reserve Components; a provision that passed in the supplemental that year offered health insurance coverage to certain members who were not eligible for other health insurance. Interviews with participants in the budgetary process noted that the expansion of education benefits for veterans was unlikely to pass in an authorization bill due to its high costs. In the case of the increases in end strength, interviewees noted that they were originally included in supplementals to ensure that they would be temporary. However, Congress eventually pushed the administration to include these changes in the base defense program. Other policy changes, such as the increases in life insurance and death benefits, were quite popular and were included in supplemental appropriations bills to ensure faster passage.

Overall, the supplemental appropriations provided a convenient and reliable mechanism for introducing defense policy changes for both the executive and legislative branches. These changes also typically moved quickly into the annual program. Miller (2007), describing benefits increases in 2003, noted that "this has been the trend with virtually any temporary increase in benefits - once awarded, never withdrawn," and went on to predict that other war related appropriations would further increase personnel benefits.²³⁸ However, this has not been the case since the transition to requesting wartime appropriations along with the annual budget.

Augmentation of Base Programs in Supplementals

As supplemental appropriations provided a convenient way to introduce defense policy changes, they also provided an opportunity for participants to augment the resources for activities already or normally

²³⁸ Miller, 2007, 85.

included in the annual budget. Congress used the supplemental appropriations bills to enhance personnel related accounts. For example, in a 2007 supplemental, Congress allocated additional resources for housing allowances for the Army and Marine Corps. The DOD also used supplementals to expand programs by requesting funding for programs normally found in its annual budget. Using supplemental appropriations, the DOD augmented its recruiting and retention budgets from 2005 through 2009 and began force design changes in the Army and Marine Corps that required additional resources for procurement. In Congressional testimony, Adams (2007) noted that augmenting base programs in this way did not "meet the reasonable test for a war-related emergency: that the requested funds meet urgent requirements that could not be anticipated in the normal budget cycle."²³⁹

The augmentation of base programs in supplemental appropriations reduced the need for tradeoffs within the annual budget. This allowed the services to pursue additional activities within the base without making trades against their current plans. Essentially, this augmentation confounded wartime costs with annual operating costs and raised the total appropriations available to execute the defense program and military operations.

Future Cost Migrations from War to Base Budgets

Another budgetary challenge that will likely result from recent wartime spending is that some costs will extend beyond the operations themselves, shifting costs from wartime budgets into the base. These cost migrations will primarily affect the O&M title, where costs were transferred earlier from the base into wartime budgets during operations or because DOD and the military services will continue new programs initiated using wartime appropriations. The new programs are primarily personnel support programs like service member and family counseling. In its 2011 and 2012 budget requests, the DOD recognized the potential for some of these moves; the 2012 budget notes a "decision to shift funding

²³⁹ Adams, 2007.

for family support programs that are enduring" into the annual budget.²⁴⁰

Based on analysis of annual and wartime O&M budgets from 2000 through 2011, the potential future costs shifting back into the services' annual budgets will likely appear in activities related to mobilization, logistics, and depot level maintenance. These activities experienced real decreases or very slow growth since 2003, while the services' overall O&M budgets grew by 49 percent in real terms. Future costs in the annual O&M budget associated with these activities may be as high as 3 to 5 percent of the individual services' 2011 base O&M costs. These potential budgetary claims, coming at the conclusion of military operations, will occur as downward pressure on the annual budget mounts. This will lead to more difficult resource tradeoffs within the regular budget among important defense programs.

Non-standard Equipment Retention Decisions

The final challenge arising out of recent wartime budgets is that the DOD must decide how to manage the stock of equipment it acquired during operations in Iraq and Afghanistan. Much of the equipment procured during these operations is not a part of normal force designs, was acquired to meet unique theater specific needs, and may provide only limited utility in future operational theaters. The use of separate wartime budgets allowed the DOD to acquire this equipment without determining long term retention plans. Post conflict, the DOD and military services may decide to integrate this equipment into their force structures, retain it in storage, or divest of it. The decisions made regarding the management of these equipment stocks will impact force structures, budgets, and the capabilities of military forces going forward.

The military services have already begun to make some of these decisions. For example, the Army procured large numbers of UAHs and

²⁴⁰ U.S. Department of Defense, *United States Department of Defense Fiscal Year 2012 Budget Request*, Washington, DC: Department of Defense, 2011, 3-4.

began integrating them into the basic force structures of BCTs by substituting them for the existing, un-armored HMMWV models. Additionally, each of the military services currently faces decisions about how to manage the fleets of MRAP vehicles procured during operations. The Army currently appears to be positioning itself to integrate some MRAPs into support units, store some for future operations, and divest of other MRAP models that performed poorly during operations.²⁴¹

Other equipment procured during recent operations may provide evolutionary advances towards capabilities currently being developed. The Army and Marine Corps acquired some advanced tactical radios during recent operations that provide many of the capabilities currently being developed in the JTRS HMS program. While the radios procured do not yet meet the same standards expected from manpack radios in the JTRS HMS program, at least one manufacturer is seeking to compete as a producer of JTRS capable manpack radios through upgrading a model sold to the Army and Marine Corps for operations in Iraq and Afghanistan.²⁴² These radios, along with other equipment that provides evolutionary advances to existing capabilities, may give the DOD the opportunity to hedge some risks of ongoing development programs or provide alternatives for future acquisition.

The challenges detailed in this section arose or were exacerbated by the manner in which recent military operations were funded. After recognizing the budgetary complications that emerged during military operations in Iraq and Afghanistan, this chapter turns to determining how other approaches to budgeting for protracted conflicts may perform during future military operations. The next section outlines alternative ways the U.S. government may budget for wars in the future, describing the potential challenges generated by each.

²⁴¹ U.S. Department of the Army, *Army Truck Program 2010*, 23, and Bertuca, Tony, "Army Wants to Divest 1,500 MRAPs; Two Variants," *InsideDefense.com*, January 27, 2011.

²⁴² Bertuca, Tony, "GD Not Worried As Harris Announces Integration of Key Radio Waveform," *Inside the Army*, December 27, 2010.

BUDGETING FOR FUTURE PROTRACTED OPERATIONS

This section highlights three different policies for funding extended military conflicts, describing the potential benefits and challenges from each. The baseline option, developed from wartime funding from 2005 to 2008, considers the use of supplemental appropriations as the primary means for wartime funding. The Title IX option, modeled after wartime requests since 2010, focuses on funding operations from an alternative budget title requested at the same time as the annual budget. Finally, the historical option is based on precedents from previous operations where operational funding was incorporated into the annual budget within a few years after operations began.

While the overall policy for wartime funding is different for each of these options, they have one thing in common. Early stages of military operations would still require supplemental appropriations since annual budgets do not include funding for initiating major operations.

Baseline Option

Under the baseline option, the costs of military operations would be funded in supplemental appropriations bills. The previous section outlined the budgetary complications that emerged when the government resourced recent operations in this way. Even though some of the challenges described in the section overlapped the different phases in funding these operations, all of the complications emerged or endured from 2005 to 2008.

While there are several budgetary complications associated with this option, the use of supplemental appropriations as the primary means for funding military operations has some benefits. Since supplemental appropriations for the war usually passed through Congress sometime between May and June, the administration was able to update its wartime request multiple times during the year. This added flexibility to the wartime budgeting process, while also creating an opening for augmenting the annual budget.

Title IX Option

Since 2010, the administration has submitted requests for funding military operations at the same time as the annual budget submission, and Congress has allocated about 90 percent of the wartime funding under Title IX of the annual defense appropriations bill. This wartime budgeting policy eliminates some of the budgetary challenges experienced in the baseline option. Since wartime resources are allocated within the annual defense appropriations bill, the normal checks are restored among participants, there is not an additional opportunity to attach potentially contentious or unrelated legislation to wartime funding, and defense policy changes cannot be inserted into the wartime budget.

While the scope of recent challenges is reduced under this option, some challenges still persist. This option does not assist with forecasting the costs of potential operations. Additionally, there are still opportunities to augment certain annual activities by associating them with the war effort, but these opportunities are reduced since wartime budgets follow the same timeline as annual appropriations. Under this option, post-war cost migrations will still affect the annual defense budget, and equipment retention decisions still linger as operations wind down.

An additional requirement for the administration also emerges under this option. The administration must develop and enforce criteria that outline items and programs that may be included in the wartime budget requests. As noted above, in 2009 the OMB issued this type of guidance to the DOD, highlighting inclusion criteria for the OCO request. Under the baseline option, the administration could develop guidance like this to influence the DOD's budget requests. However, from 2005 through 2008, inclusion criteria were far more informal and requests expanded in 2007 based on guidance from the Deputy Secretary of Defense. The development of this guidance may also be used to reduce post-war cost migrations and clarify equipment retention decisions.

Even as this option reduces some of the budgetary complications relative to the baseline, it does not eliminate the potential need for supplemental appropriations, even during latter stages of military operations. Military operations are dynamic events that require regular

reappraisal of plans and strategy. Adjustments made in the course of operations often require additional funds that were not forecasted in the budget submission, which occurs months before execution under this option. The decision to increase the forces in Afghanistan in 2010 along with their associated costs provides an example of the potential need for supplemental appropriations when operational plans change. This decision, made after the start of the fiscal year in December 2009, prompted a request for about \$33 billion in supplemental appropriations, largely to allow for the increase in forces in Afghanistan. Supplemental appropriations in 2010 amounted to about 20 percent of the total wartime funding that year. Even though supplemental appropriations may be necessary under this option, they will be a smaller portion of the wartime budget.

Historical Option

The final option the government may use to provide resources for military operations is simply to include the funding for operations in the annual appropriations bill. Prior operations provide precedent for this option as "past Administrations have requested, and Congress has provided, funding for ongoing military operations in regular appropriations bills as soon as even a limited and partial projection of costs could be made."²⁴³ Applying this option would further limit the budgetary complications associated with the other options. Since both war and base budgets would be requested together the normal checks among governmental participants would apply, there would not be an additional "must pass" bill where unrelated and contentious legislation could be attached, and defense policy changes would occur in the normal process. Additionally, since all defense funding would be in the same bill, wartime funds could not be used to augment base programs. This does not necessarily mean that the annual DOD budget would not grow; the annual budget generally expands during military operations. However, the

²⁴³ Daggett, 2006, 2.

opportunity to augment programs outside of the base would be removed under this option.

While limiting the budgetary challenges, some potential problems would still remain. This option would not aid in the ability to forecast the costs of potential operations. Additionally, the potential exists for post war cost increases, called cost migrations above, for activities where annual operating costs decrease during military operations. These cost increases would be more limited under this option since all funds derive from the same budget. Like the Title IX option, this option does not prevent the potential need for supplemental appropriations during a conflict.

The historical option also introduces some additional complications that the baseline or Title IX options would not. First, since all funding would come from the same budget, it may become very difficult to distinguish between the annual and wartime costs. Defense budgeting during the Korean War highlights the challenges in distinguishing between war and base costs. From 1951 to 1952 the DOD annual budget grew from \$13 billion to \$55.2 billion, which allowed the department to both prosecute the war in Korea and rapidly expand force structure.²⁴⁴ However, the DOD budget did not clearly distinguish between the general build-up and the wartime operational requirements, leading to tensions between the executive and legislative branches.²⁴⁵ Clearly identifying operational costs is important since resources for military operations are always prioritized. Misunderstanding of wartime costs outside of the DOD could bring about a situation where fewer resources are dedicated to the war than necessary, prompting requests for supplementals or potentially reducing the scope or pace of operations.

The second additional complication that may arise when funding operations within the annual budget is that activities in the base defense program may be traded for operational needs. This could occur either because of a failure to distinguish wartime from annual costs or

²⁴⁴ Ibid., 3.

²⁴⁵ Miller, 33-37.

due to top line constraints placed on the annual budget. Miller (2007) notes that in Vietnam "spending reductions and fiscal constraints even began to dictate military operations," highlighting that budgetary constraints led to reductions in planned B-52 sorties in 1969.²⁴⁶ The annual defense budget allows for the development of forces based on national strategy; trading resources from developing military capability in order to execute operations would permit the consumption of military capability, potentially reducing the DOD's ability to fulfill its necessary future requirements.

Budgeting Option Conclusions

This section outlines the different options the U.S. government may use to budget for military operations. Each option presents different budgetary challenges, summarized in Table 8.4. All three options have the potential for poor cost forecasts and cost migrations. Meanwhile, the Title IX and historical options reduce the budgetary complications presented by the baseline but introduce other challenges.

Table 8.4
Budgeting Option Summary

Challenge	Baseline	Title IX	Historical
Wartime Cost Forecast	✓	✓	✓
Weakened Checks among Participants	✓		
Unrelated and Contentious Provisions	✓		
Base Augmentation	✓	✓	
Defense Policy Changes	✓		
Cost Migrations into Annual Budgets	✓	✓	✓
Equipment Retention	✓	✓	
Budget Criteria Development		✓	
Additional Supplementals Possible		✓	✓
Distinguishing War and Base Costs			✓
Tradeoffs in Base for Operational Needs			✓

²⁴⁶ Ibid., 60.

OTHER POLICY OPTIONS TO INFLUENCE WARTIME BUDGETING

While the previous section described the overall budgeting options for protracted military operations, this section outlines two other policy options that may influence wartime budgeting. The first option is modeled on some past analyses that indicated the DOD may benefit from an annually approved contingency fund to be used during early phases of operations. The second option is to apply budgetary analyses to defense planning scenarios to aid in the understanding of the costs of potential operations. While neither of these options directly focuses on how the DOD budgets during wartime, they may reduce the intensity of some of the budgetary challenges during military operations.

Increased Funding for Overseas Contingency Operations Transfer Fund

Frequent, small military commitments throughout the 1990s led to concerns about appropriate ways to pay for military operations. In 1994, the GAO issued a report to Congress outlining potential options for funding early phases of military commitments. One idea presented was the establishment of a transfer account that would allow the DOD to "respond promptly to emergencies without disrupting other planned activities or operations."²⁴⁷ In 1997 Congress established the Overseas Contingency Operations Transfer Fund (OCOTF) in the DOD's annual budget due to concerns that the lack of resources in the base for operations creates budgetary execution challenges when the DOD is required to deploy forces. Thus, the OCOTF provides the DOD with funding dedicated to meeting the operational requirements early in a contingency "without disrupting approved program execution or force readiness."²⁴⁸

Table 8.5 highlights that since creating the OCOTF, Congress has appropriated very little to the fund. After the creation of the OCOTF,

²⁴⁷ U.S. General Accounting Office, *DOD Budget: Analysis of Options for Funding Contingency Operations*, GAO/NSIAD-94-152BR, Washington, DC: General Accounting Office, 1994, 17.

²⁴⁸ U.S. Department of Defense, "Justification for Component Contingency Operations and the Overseas Contingency Operations Transfer Fund," *Fiscal Year 2011 Budget Estimates*, Washington, DC: Department of Defense, 2010, 1.

administrations began to use it to provide resources for ongoing operations in places like Bosnia, Kosovo, and Southwest Asia before Operation Iraqi Freedom.²⁴⁹ For example, the administration requested about \$2.8 billion in OCOTF appropriations in 2002, but the entire amount was designated for operations in Bosnia and Kosovo.²⁵⁰ Thus, while the OCOTF provided funds for ongoing operations, there was little or no funding available for emerging operations. One option the DOD and Congress may consider to reduce the reliance on supplemental appropriations and allow for more consistent budgetary execution is to dramatically increase funding to the OCOTF.

Table 8.5
Requests and Appropriations to the OCOTF (Current \$ millions)

Year	Request	Appropriation
1997	0	1,140
1998	1,468	1,884
1999	747	439
2000	2,388	1,723
2001	4,101	3,939
2002	2,844	50
2003	53	5
2004	50	5
2005	30	10
2006	20	0
2007	10	0
2008	5	0
2009	9	0
2010	5	5,000
2011	5	0

Sources: Annual DOD Budget Justification Documents and Defense Appropriations Bills.

²⁴⁹ Serafino, Nina M., *Peacekeeping: Issues of U.S. Military Involvement*, Washington, DC: Congressional Research Service, December 13, 2001, 6.

²⁵⁰ U.S. Department of Defense, *Overseas Contingency Operations Transfer Fund, FY2002 Amended Budget Submission*, Washington, DC: Department of Defense, June 2001, 1.

One may argue that appropriating greater amounts to the OCOTF would provide a means of reducing the early reliance on supplemental appropriations while ensuring that the DOD is able to execute its budget according to its original plans. Doing this could also potentially reduce budgetary complications associated with unrelated and contentious provisions, base budget augmentation, and defense policy changes in the early stages of military operations. However, adopting this policy would likely meet resistance while not making a significant impact on budgeting for major operations.

Participants in the budgetary process would likely not favor large increases to the OCOTF for several reasons. First, providing the president with a large amount of available contingency funding would further reduce Congressional oversight during early phases of military operations. Additionally, the OCOTF would require a large amount of funding to make a significant impact during major operations. For example, the president requested \$53.4 billion for initial operations in Iraq through September 2003.²⁵¹ Participants would not likely favor such a dramatic increase to the OCOTF because it would increase projected spending, which would require tradeoffs within the rest of the DOD and federal budgets. Finally, the budgetary complications this alternative may reduce were not severe during early phases of recent operations.

Budgetary Analysis of Defense Planning Scenarios

Another option that the DOD could implement to influence wartime budgeting is to conduct budgetary analysis of accepted defense planning scenarios. The DOD conducts scenario planning to aid in determining the size, composition and capabilities required by military forces. In 2010, the Quadrennial Defense Review (QDR) used "scenario combinations to represent the range of likely and/or significant challenges anticipated in the future" to assess forces and develop plans for their

²⁵¹ U.S. Executive Office of the President, Office of Management and Budget, "Requests for 2003 Supplemental Appropriations," *Fiscal Year 2003 Budget of the United States*, Washington, DC: Government Printing Office, March 25, 2003.

evolution.²⁵² The scenarios mentioned in the QDR include operations involving major combat, counterinsurgency, stability, and civil support efforts.²⁵³ While future operational commitments will not exactly mirror any of the scenarios used, budgetary analysis of individual scenarios would aid in reducing the cost uncertainty underlying possible military operations in the future. This analysis would allow the DOD to describe the potential cost of an operation and could thus improve the accuracy of cost forecasts prior to an operation as well as providing a means for quicker and more accurate funding requests during early stages of an operation.

There is some precedent for this type of activity within the Logistics Civil Augmentation Program (LOGCAP). LOGCAP is an "initiative for peacetime planning for the use of civilian contractors in wartime and other contingencies" designed to provide contracted support to U.S. forces operating overseas.²⁵⁴ The LOGCAP contract anticipates the potential use of services while requiring "contingency planning" for deployment scenarios to specific locations around the world.²⁵⁵ While LOGCAP planning goes beyond the cost development analysis described above, it does provide an example of the DOD conducting cost planning using scenarios.

Budgetary analyses of defense planning scenarios would not play a role in the ongoing development the defense budget through the Planning, Programming, Budgeting and Execution System since this process aids in determining the annual and long term resources needed for developing capabilities. It would instead be applied to inform decision makers about the potential costs of using military capability. This process

²⁵² U.S. Department of Defense, *Quadrennial Defense Review Report*, Washington, DC: Department of Defense, February 2010, 42.

²⁵³ Ibid., 42-45.

²⁵⁴ Clements, Dennis C. and Margaret A. Young, "The History of the Army's Logistic Civilian Augmentation Program: an Analysis of its Oversight from Past to Present," MBA Professional Report, Monterey, CA: Naval Post Graduate School, December 2005, 16.

²⁵⁵ Stollenwerk, Michael, "LOGCAP: Can Battlefield Privatization and Outsourcing Create Tactical Synergy?," Fort Leavenworth, KS: School of Advanced Military Studies, December 1998, 28.

could also be used to examine costs if certain assumptions about the length or intensity of an operation prove to be incorrect. Not only is this activity potentially helpful, it is also feasible since it would be based on approved scenarios and could utilize budgetary tools developed and refined during recent military operations.

The Contingency Operations Support Tool (COST) is the type of budgetary tool that could be applied for this analysis. The DOD used the COST to develop large portions of its wartime budget requests during operations in Iraq and Afghanistan. Miller (2007) described the utility of the COST for the development of budget requests for recent operations noting that the COST's estimates "were much closer to monthly implementation rates" than during previous operations and it is "widely accepted by both the Executive and Legislative branches."²⁵⁶ The GAO (2008) reported on the COST and described several aspects of the COST that would be shortcomings of the tool for this application. Specifically, GAO noted that the COST "does not have the capability to estimate costs such as procurement, reset-related equipment maintenance, and contracted needs and services."²⁵⁷ Thus, if the COST were used for this analysis it would need to be updated to estimate these war related expenses, or additional analyses would need to provide these estimates. Overall, the DOD could apply COST or develop an alternative model to begin conducting analyses on the resources that may be required for potential operations in the future.

CONCLUSIONS

Military operations are fraught with many difficulties that range from the tactical challenges faced on the battlefield to the political difficulties in determining and achieving a desired end state. This chapter highlights the difficulties the government faces when budgeting for military operations and details some policy options that could serve

²⁵⁶ Miller, 70.

²⁵⁷ U.S. Government Accountability Office, *Defense Budget: Independent Review Is Needed to Ensure DOD's Use of Cost Estimating Tool for Contingency Operations Follows Best Practices*, GAO-08-982, Washington, DC: GAO, September 2008, 13.

to reduce the size and scope of these challenges. Since the DOD's annual budget does not and should not include large allocations for the initiation of operations, there remains a need for supplemental appropriations during early phases of any military operation. Beyond this, there are ways to reduce the degree of challenges that appeared during recent operations along with decreasing the overall budgetary uncertainty of potential operations.

Several preventable budgetary complications emerged during the course of operations in Iraq and Afghanistan. An administration prosecuting military operations should mitigate these challenges through the development of operational funding criteria early in an operation while requesting the resources for continuing operations along with the annual budget. Highlighting acceptable wartime costs early in an operation will reduce the potential base augmentation while also limiting the potential for post conflict cost migrations. Meanwhile, requesting wartime funding at the same time as the annual budget eliminates the possibility of some other challenges. These actions will not prevent the administration from flexibly executing its selected strategy as there are still opportunities to request supplemental appropriations should the need arise.

If the administration does not request funding with the annual budget, then Congress could demand this. The 2007 NDAA stated that after 2007 the president should include "a request for the appropriation of funds for such fiscal year for ongoing military operations in Afghanistan and Iraq" at the same time as the annual budget submission.²⁵⁸ The administration complied in 2008, requesting wartime funding at the same time as its annual budget. Alternatively, Congress could require presidential certification of the need for supplemental appropriations after operations persisted into their third year.

Finally, conducting budgetary analysis using approved defense scenarios would reduce some budgetary uncertainties during the early

²⁵⁸ U.S. Congress, *John Warner FY 2007 National Defense Authorization Act*, P.L. 109-364, Sec. 1008, 2006.

stages of an operation. This analysis would be useful in the development of cost forecasts. It would also help in the development of initial wartime budget requests and could serve to further reduce complications like base budget augmentation.

APPENDIX

A. WARTIME REQUESTS AND APPROPRIATIONS

Throughout the dissertation, I examine and describe wartime appropriations. Chapter One outlines three distinct phases in wartime budgets, Chapter Three highlights an analysis of a theoretical model for ongoing wartime supplemental appropriations, and Chapters Four through Six identify how wartime spending impacts the annual budget. The results presented in these chapters relied on data from both wartime funding requests and appropriations. This appendix details a dataset developed for this analysis that allows for the identification of specific program elements in wartime funding. Official requests from the OMB and DOD for wartime appropriations served as the basis for the request section of the data. The resulting appropriations bills and accompanying reports were used for the appropriations section of the data.

Beginning with the Defense Appropriations Act of 2005, a large portion of wartime funds were appropriated under Title IX in the annual defense budget, and were often referred to as bridge funds. Even though this funding does not meet the explicit definition of supplemental appropriations since it was not passed after the annual appropriations bill, I included bridge funds in this data as supplemental appropriations for several reasons. Bridge funds were declared emergency appropriations for ongoing military operations and were designed to provide enough funding to "‘bridge’ the gap between the beginning of the fiscal year and passage of a supplemental."²⁵⁹ They either resulted from an official request for supplemental appropriations or were not requested prior to their passage, leading to similar levels of DOD and Congressional scrutiny. Furthermore, subsequent requests for supplemental appropriations often referred to bridge funds, sometimes updating the request in light of the amount of funding attached to different titles in bridge funds.

²⁵⁹ Belasco, 2010, 45.

The dataset focuses on requests and appropriations to the DOD for military operations, excluding supplemental appropriations provided to the DOD for domestic operations in the aftermath of natural disasters, like Hurricane Katrina. Table A.1 highlights the amounts requested and provided to DOD from 2001 through 2012. Throughout this appendix, the amounts displayed are current year dollars in billions.

Table A.1
DOD Annual Wartime Supplemental Appropriations

Year	Request ²⁶⁰	Appropriations	Difference	% Difference
2001	13.74	13.74	0	0%
2002	21.37	16.87	-4.5	-21%
2003	62.62	62.35	-.27	0%
2004 ²⁶¹	65.52	65.11	-.42	0%
2005	99.45	100.86	1.41	1%
2006	115.93	115.86	-.07	0%
2007	163.31	169.61	6.1	4%
2008	189.43	190.30	.88	0%
2009	140.14	143.57	3.43	2%
2010	163.01	160.46	-2.56	-2%
2011	160.14	157.68	-2.46	-2%
2012	117.73			
Total	1,204.26	1,196.20	-8.06	-1%

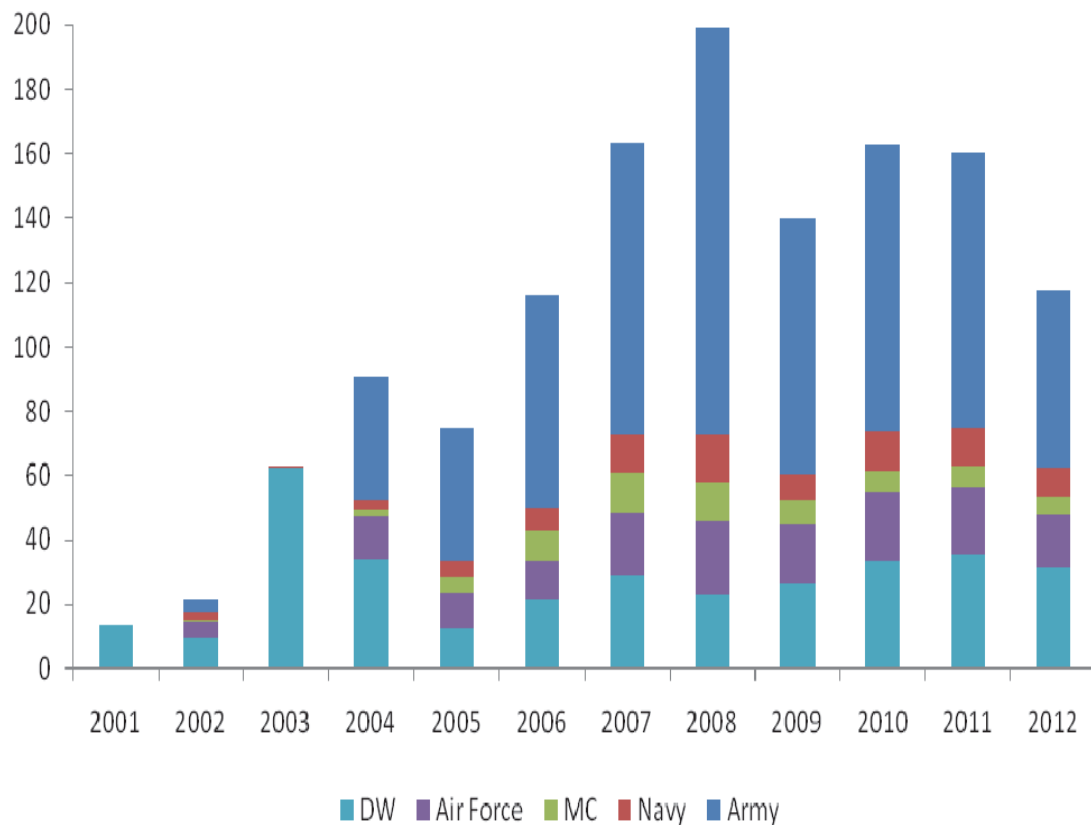
Sources and notes: Presidential requests for appropriations, DOD justification documents, Public Laws. Numbers may not add due to rounding. The total does not include 2012 since appropriations have not been made as of this writing.

²⁶⁰ The total request for each year reflects funding provided in bridge funds. For example, in 2006 Congress added \$50B in emergency funding to the Department of Defense Appropriations Act. While this funding was not requested, the later supplemental request submitted by DOD takes this previous funding into account.

²⁶¹ In 2004, Congress passed \$25 billion of additional wartime funding in Title IX of the 2005 annual appropriations bill. However, at the time, the DOD anticipated a shortfall in wartime funds for 2004 so Congress made this funding available immediately. The DOD used about \$2.2 billion in 2004. Since the appropriations were made for 2005, the entire \$25 billion bridge is included in that year.

While Table A.1 shows aggregate amounts, the dataset allows for analysis of requests and appropriations by each of the different military services as well as by funding title and subtitles. This detail provides the opportunity to identify important trends in wartime funding. Figures A.1 and A.2 highlight the share of wartime funding requested and provided to each of the services since 2001.

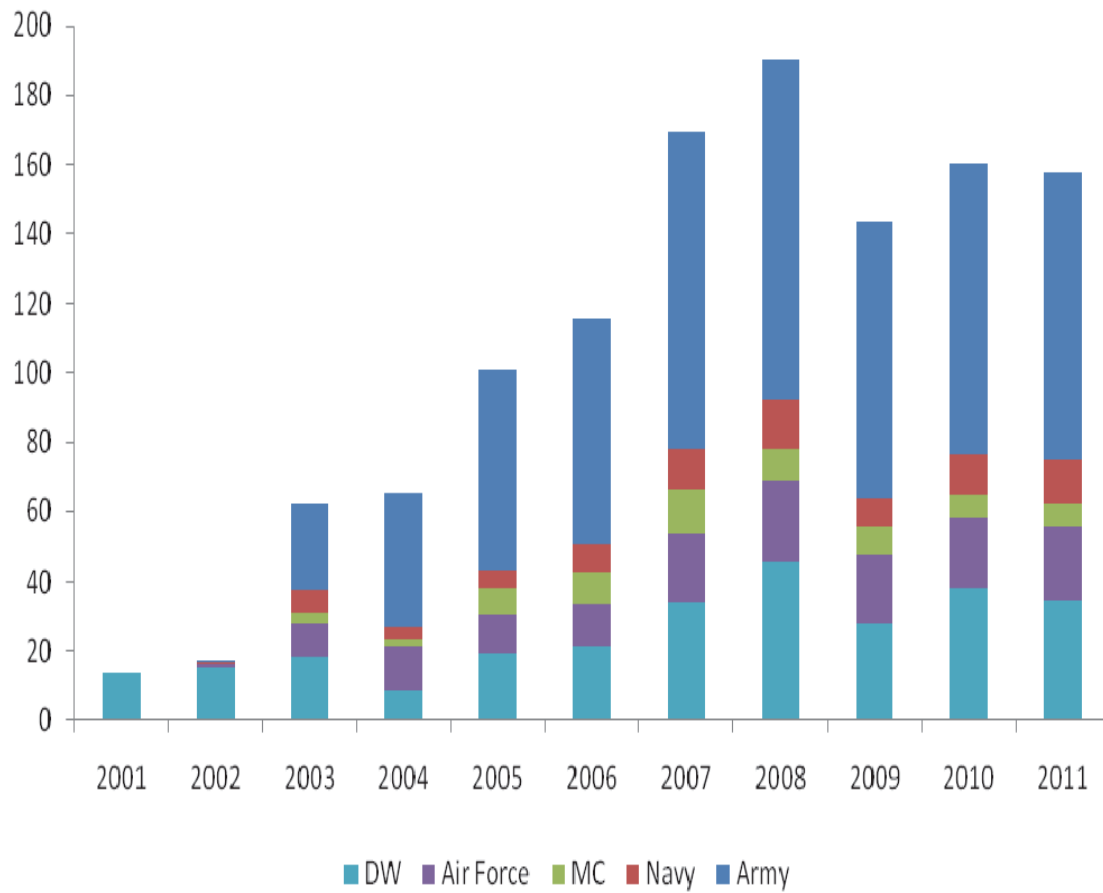
Figure A.1
Wartime Requests by Military Service



Sources: Presidential requests for appropriations and DOD justification documents.

Through 2003, almost all of the administration's funding requests focused on the DERF, a DW transfer account. After 2004, the Army's share of requests was greatest.

Figure A.2
Wartime Appropriations by Military Service



Sources: Public Laws.

The dataset also allows for the examination of appropriations by title for each of the military services. Figures A.3 through A.8 display the services' wartime requests and appropriations by title.

Figure A.3
Army Wartime Requests



Sources and notes: Presidential requests for appropriations and DOD justification documents. Military personnel is used to represent the military personnel title, and Mil Con is used to represent the military construction title.

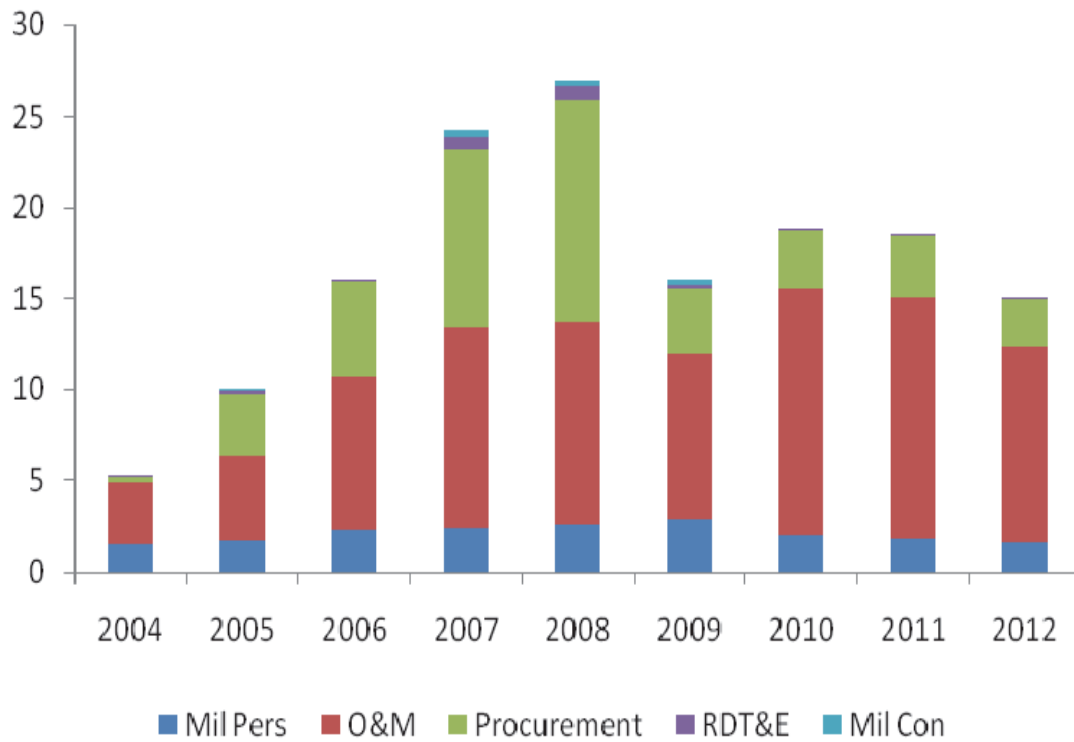
Data for Figure A.3 begins in 2004 since most requests prior to that year focused on the DERF. The Army procurement request in 2008 included funds for MRAPs; these are not displayed in the Figure A.4 since Congress appropriated funding to the DW MRAP Account beginning in 2008.

Figure A.4
Army Wartime Appropriations



Sources: Public Laws.

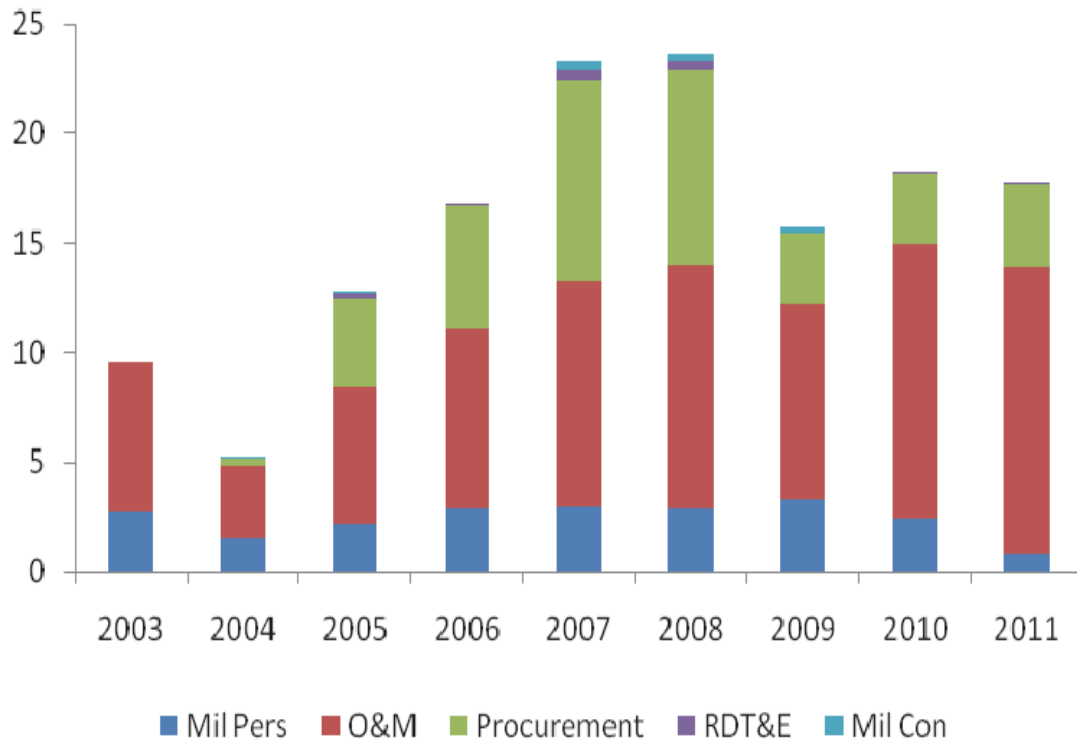
Figure A.5
Navy and Marine Corps Wartime Requests



Sources: Presidential requests for appropriations and DOD justification documents.

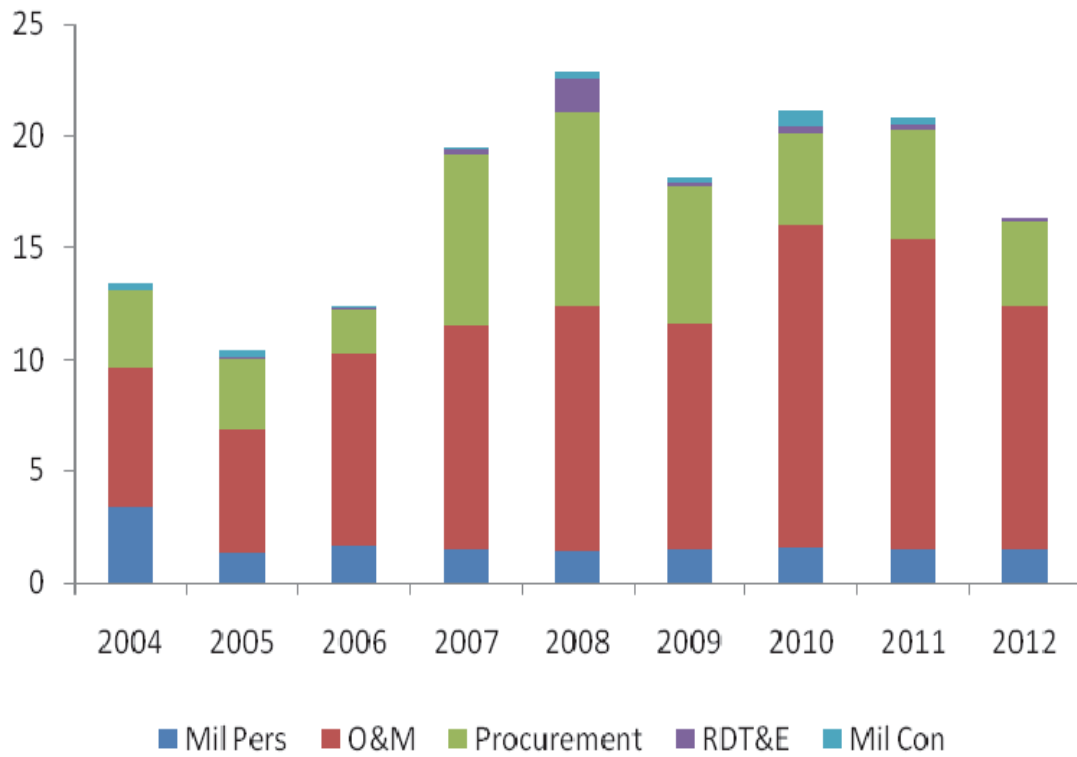
Navy and Marine Corps are combined in Figures A.5 and A.6 since they share some of the same accounts.

Figure A.6
Navy and Marine Corps Wartime Appropriations



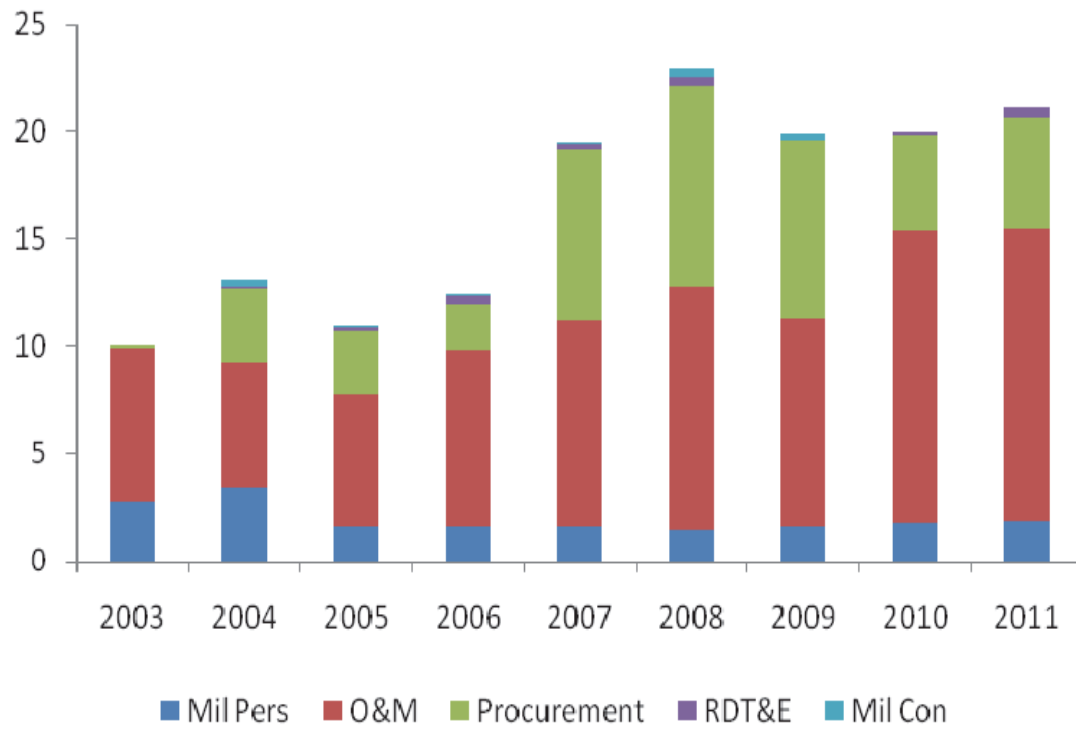
Sources: Public Laws.

Figure A.7
Air Force Wartime Requests



Sources: Presidential requests for appropriations and DOD justification documents.

Figure A.8
Air Force Wartime Appropriations



Sources: Public Laws.

B. INTERVIEWS

In order to better understand the budgetary process, interactions between the participants in this process, and the outcomes that resulted from wartime budgetary policy, I conducted interviews with individuals involved in defense budgeting within both the executive and legislative branches. The results of these interviews are used to illuminate issues discussed throughout this dissertation. This appendix outlines the general protocol used to conduct these interviews. However, some interviews focused on specific areas of expertise for that particular respondent.

1. From your perspective, where was the center of decision making for supplemental appropriations?
2. Was the DOD request limited by the administration (explicit/implicit)?
3. How did the urgency to get funds appropriated through the supplemental appropriations process influence the way that requests were developed? How much detail went into each request?
4. In your experience, what were the hardest funding tradeoffs? How did these influence operations?
5. Were the supplemental requests seen as a way to expand defense spending beyond what was needed for current operations?
6. Did the DOD anticipate potential shifts in funding from Congress? How?
7. What are the biggest benefits to using supplemental appropriations as the primary instrument for funding military operations?
8. Does Congress place additional urgency on requests for supplemental appropriations for military operations? How does this potential urgency impact the final bill?
9. Does the urgency to pass supplementals reduce Congressional oversight of the items in a request? Is this something that lasted throughout these requests or was Congress able to reestablish appropriate oversight through activities like the Special

Inspectors General in Iraq and Afghanistan?

10. How has defense policy changed through the supplemental appropriations bills?
11. What are the risks of using supplemental appropriations for an extended period of time?
12. What was the most important item/program introduced solely in wartime budgets?

C. COMPARING CURRENT AND FUTURE TWVs TO MRAPs

Chapter Four describes the results of an analysis considering potential MRAP retention and allocation into the Army's force structure upon completion of operations in Iraq and Afghanistan. One aspect of this analysis was a comparison of MRAPs with some current and future TWVs in order to determine potential roles for MRAPs along with the expected benefits and drawbacks when incorporating them into the Army's basic TWV fleets. The tables below highlight performance characteristics for the different vehicles considered in this analysis.

Table C.1
UAH Performance Characteristics

	UAH M1165	UAH M1152	UAH M1151	UAH M1167
Role	Command and Control (C2), General	Infantry Transport, Logistics	Armament Carrier	TOW Carrier
Gross Vehicle Weight (pounds)	11,500	12,100	13,450	13,100
Length (inches)	194	194	194	194
Width (inches)	87	87	91	91
Height (inches)	76	76	78	102
Ground clearance (inches)	18	18	17	16
Fording Depth (inches)	30	30	30	30
Turning Radius (feet)	25	25	25	25
Gradeability	40%	40%	40%	40%
Side Slope	30%	30%	30%	30%
Angle of Approach (degrees)	48	48	49.0	53.0
Angle of Departure (degrees)	40	39	37	39
Maximum Speed (miles per hour)	70	70	70	70
Payload (pounds)	2,230 - 4,800	3,340 - 5,000	3,000- 5,820	1,850
Seating (Crew + Passengers)	4	2 + 8	5	5
Minimum Range (miles)	250	250	250	250
Consumption (gal per mile)	0.07	0.07	0.07	0.07
Fuel Capacity (gallons)	25	25	25	25

SOURCES: AM General vehicle specification documents and OSMIS database. TOW stands for Tube-launched, Optically tracked, Wire-guided missile.

Table C.2
FMTV Performance Characteristics

	LMTV	MTV
Role	Logistics	Logistics
Gross Vehicle Weight (pounds)	23,000	25,000
Length (inches)	265	286
Width (inches)	96	96
Height (inches)	111	111
Gradeability	60%	60%
Side Slope	30%	30%
Angle of Approach (degrees)	40	40
Angle of Departure (degrees)	40	40
Maximum Speed (miles per hour)	55	55
Payload (pounds)	5,000	10,000
Seating (Crew)	3	3
Minimum Range (miles)	300	300
Consumption (gal per mile)	0.15	0.19
Fuel Capacity (gallons)	56	56

SOURCES: Oshkosh vehicle specification documents and OSMIS database.

Table C.3
Oshkosh and Navistar MRAP Performance Characteristics

	M-ATV	MaxxPro	MaxxPro Plus	MaxxPro Dash
Gross Vehicle Weight (pounds)	27,500	43,500	53,000	34,000
Length (inches)	246	254	254	246
Width (inches)	98	102	102	102
Height (inches)	105	120	120	109
Ground clearance (inches)	13.6	11	11	11
Fording Depth (inches)		36	36	36
Turning Radius (feet)	54	62	62	54
Gradeability		60%	60%	60%
Side Slope		30%	30%	30%
Angle of Approach (degrees)		40	40	40
Angle of Departure (degrees)		42	42	42
Maximum Speed (miles per hour)	65	69		
Payload (pounds)	4,000	3,650	8,470	10,000
Seating	5	7	7 to 9	7
Minimum Range (miles)	300			
Consumption (gal per mile)	0.25	0.25	0.25	0.25

SOURCES: Oshkosh and Navistar vehicle specification documents, OSMIS database, and U.S. Department of the Army, *Fielding and Use of the Mine Resistant Ambush Protected Vehicles at Army Installations in the United States*, Washington D.C.: Department of the Army, June 2009.

Table C.4
Other MRAP Performance Characteristics

	RG31 Cat 1	RG33L Cat II	Caiman 4x4	Cougar Cat 1	Cougar Cat 2
Gross Vehicle Weight (pounds)	31,300	50,200	37,000	48,000	69,000
Length (inches)	236	333	304	222	268
Width (inches)	97	113	97	102	102
Height (inches)	107	134	111	103	103
Ground clearance (inches)	14	15	14		
Fording Depth (inches)			36	39	39
Turning Radius (feet)	62	77	62		
Gradeability	60%	60%	60%		
Side Slope	30%		30%		
Angle of Approach (degrees)	32		43		
Angle of Departure (degrees)	45		50		
Maximum Speed (miles per hour)	55	68	73	65	65
Payload (pounds)	4,450	5,000	5,400	4,000	12,000
Seating	8	10	10	6	10
Minimum Range (miles)			401	600	600
Consumption (gal per mile)	0.25	0.25	0.25	0.25	0.25

SOURCES: BAE vehicle specification documents, OSMIS database, Military Periscope, "Cougar Mine-Resistant Vehicle," and U.S. Department of the Army, *Fielding and Use of the Mine Resistant Ambush Protected Vehicles at Army Installations in the United States*, Washington D.C.: Department of the Army, June 2009.

Table C.5
Expected JLTV Performance Characteristics

	JLTV - A	JLTV - B	JLTV - C
Role	C2, General, Armament/TOW	Personnel Mobility, Cargo	Logistics
Gross Vehicle Weight (pounds)	19,950		19,950 - 23,950
Ground clearance (inches)	24		24
Fording Depth (inches)	30		30
Turning Radius (feet)	16-25	16-25	25-28
Gradeability	60%		60%
Side Slope	40%		40%
Angle of Approach (degrees)	60		60
Angle of Departure (degrees)	45		45
Maximum Speed (miles per hour)	70		70
Payload (pounds)	3,400 - 5,100	4,500 - 5,100	5,100 - 5,500
Seating	4	6 to 7	2 to 3
Minimum Range (miles)	300		300

SOURCES: U.S. Department of Defense, *Draft Purchase Description for Joint Light Tactical Vehicle Family of Vehicles*, Version 2.3, Washington D.C.: Department of Defense, April 2010.

D. ALLOCATING MRAPs

This appendix outlines the method used to estimate the number of MRAPs the Army will allocate to BCTs and their supporting units for both overseas operations and during training. Tables D.1 and D.2 summarize characteristics of the current IBCT and HBCT force structures, aggregated by battalion/squadron.

Table D.1
IBCT Personnel and TWVs

	Number	Personnel	Combat Personnel	UAH	UAH - Weapons	LMTVs (4x4)	MTVs (6x6)
Infantry Bn	2	688	539	71	16	6	5
RSTA Sqdrn	1	398	266	76	40	1	8
Fires Bn	1	307	176	88	0	4	14
BSTB	1	395	60	92	18	6	13
BSB	1	799	0	89	0	53	66
IBCT		3455	1580	519	90	81	112

SOURCE and Notes: Data collected from U.S. Army Armor Center, *FKSM 71 - 8 Armor/Cavalry Reference Data: Brigade Combat Teams*, Fort Knox, Kentucky: Directorate of Doctrine, and Combat Development, May 2010. In Bn represents Infantry Battalion, RSTA Sqdrn is Reconnaissance, Surveillance, and Target Acquisition Squadron, BSTB is Brigade Special Troops Battalion, and BSB represents Brigade Support Battalion.

Table D.2
HBCT Personnel and TWVs

	Number	Personnel	Combat Personnel	UAH	UAH - Weapons	LMTVs (4x4)	MTVs (6x6)
CAB	2	627	464	30	5	4	7
RSTA Sqdrn	1	424	284	52	31	4	6
Fires Bn	1	316	182	52	0	2	5
BSTB	1	504	109	93	16	6	15
BSB	1	1025	0	102	0	20	52
HBCT		3708	1513	392	57	45	93

SOURCE and Notes: Data collected from U.S. Army Armor Center, *FKSM 71 - 8 Armor/Cavalry Reference Data: Brigade Combat Teams*, Fort Knox, Kentucky: Directorate of Doctrine, and Combat Development, May 2010. CAB represents Combined Arms Battalion.

Combat personnel in these tables are defined as personnel assigned to infantry, tank, reconnaissance, field artillery or combat engineer platoons along with other individuals who are assigned to a tank or Bradley Fighting Vehicle. The columns labeled UAH include all UAHs assigned to the organization while the column labeled UAH - Weapons includes only Armament Carrier or TOW Carrier variants. Lastly, the columns for FMTVs only include cargo variants.

MRAP ALLOCATION DURING OPERATIONS

The number of MRAPs allocated to Army BCTs in future operations may vary based on the types of threats, the operating environment, and the types of MRAPs used. As the Army began fielding MRAPs in 2007, recommendations for a basis of issue for MRAPs varied from "as few as eight to as many as 27 vehicles" at the company level.²⁶² This section outlines the method used to estimate a range of the number of MRAPs that BCTs and their supporting units might require during deployment based on the number of vehicles and personnel in the unit, using the CAB from the HBCT as an example. Table D.3 highlights estimated MRAP allocation for this organization during a deployment; vehicle numbers do not add due to rounding.

²⁶² Stafford, Thomas J., "The MRAP Vehicle: The New Icon of Operation Iraqi Freedom," *Infantry Magazine*, November-December 2007, 19.

Table D.3
Combat Arms Battalion Low Estimate for MRAP Allocation

	Headquarters (1)	Rifle Co (2)	Tank Co (2)	CAB Total
Personnel	233	135	62	627
Combat Personnel	94	129	56	464
UAH	22	2	2	30
UAH - Weapons	5	0	0	5
FMTV	7	1	1	11
MRAP (Weapons)	5	0	0	5
MRAP (Combat Pers)	12	22	9	74
MRAP (UAH)	6	1	1	8
MRAP (FMTV)	2	0	0	4
MRAP Total	25	23	10	91

This method for allocating MRAPs begins by assigning one MRAP for each UAH weapons carrier. Then, to correct for the number of personnel assigned to weapons carriers, one MRAP is assigned for every six combat arms service members. Finally, one MRAP is allocated for every three remaining UAHs and FMTVs. This allocation provides MRAP mobility for combat purposes along with additional MRAPs to augment or substitute for a portion of the rest of the BCT's vehicles. The high estimate follows a similar methodology, but provides additional supporting MRAPs for every two UAHs and FMTVs. Table D.4 highlights the estimated range of MRAPs required by BCTs and their supporting elements. The BCT average is weighted to account for the different numbers of IBCTs and HBCTs in the Army.

The estimates for MRAP-equipped BCTs seems reasonable and in line with current Army statements. For example, in its June 2010 report to Congress, the Army explains that it will allocate "over 9,000 [MRAP] vehicles in 20 task-organized Brigade Combat Team sets stored in Army

Pre-Positioned Stocks (APS) and CONUS storage facilities.”²⁶³ According to the estimates provided in Table D.4, it takes about 9,500 to 11,360 MRAPs to fully equip 20 BCTs.

Table D.4
Estimated MRAP Allocation for BCTs

BCT	Low Estimate	High Estimate
IBCT	500	600
HBCT	430	510
BCT (Average)	470	570

In an operating environment where BCTs use MRAPs for additional protection, headquarters elements and supporting forces will likely need some as well. Thus the estimates above need to be adjusted to include additional MRAPs for headquarters and supporting forces. However, estimating these figures is not as straightforward as it was for BCTs. Beginning in 2005, the Army converted its force structure to create modular brigades to allow for the deployment of tailored force packages; there is not a specific support structure allocated for a certain number of BCTs.²⁶⁴ To adjust for headquarters and support brigades, the model provides an additional 50 to 100 percent of the MRAPs that BCTs need for a deployment. Table D.5 displays an estimated range of MRAPs required for deployed BCTs and supporting forces.

Table D.5
Estimated MRAP Allocation for BCTs and Supporting Organizations

BCT	Low Estimate	High Estimate
IBCT	750	1,210
HBCT	640	1,020
BCT (Average)	710	1,140

²⁶³ U.S. Department of the Army, *Army Truck Program*, 2010, 23.

²⁶⁴ Johnson et al., 7-14.

E. MODELING THE COSTS OF MRAP ALLOCATION

Costs of the various MRAP retention options described in Chapter Seven are based on data collected from the Army's OSMIS database. OSMIS contains operating and support data for various Army vehicles and weapons systems that allows estimates of MRAP usage rates, cost per mile, and storage costs. So far, the military services have used MRAPs almost exclusively for combat operations. There are likely very different usage and costs rates for vehicles used in combat than those used in training. Data collected on other vehicles indicate that some types of vehicles experience nearly twice as many miles during contingency operations as they do during training. Other data indicate that the operating costs per mile are less during training than during combat. Therefore, recent MRAP usage rates and costs per mile are likely higher than expected during peacetime operations. Due to these factors, along with the short period of time MRAPs have been in the inventory, the data available are insufficient for detailed cost estimates of each of the alternatives. Cost estimates provided in this analysis are therefore rough but remain appropriate considering the magnitude of the differences in costs between each of the alternative options.

Data from several different types of vehicles including HMMWVs, LMTVs, MTVs, and Armored Security Vehicles (ASV) provided the means to adjust the MRAP estimates. Table E.1 highlights the average annual use for these types of wheeled vehicles from 2000 - 2010 for vehicles not involved in contingency operations. Densities listed in the table are the total number of vehicle observations OSMIS reported during the period.

OSMIS includes the average maintenance costs per mile for MRAPs from 2007 through 2009 during contingency operations. However, it is likely that vehicle operating costs are less during training than during contingency operations. As noted above, these costs are adjusted by a factor derived from the difference between the costs per mile during training and in contingency operations for several vehicle types.

Table E.1
Average Annual Vehicle Usage for Training

Vehicle	Density	Avg OPTEMPO
ASV	492	1,343
HMMWV	209,170	2,816
LMTV	29,912	2,508
MTV	15,803	2,267

SOURCE: OSMIS database.

Table E.2
Training and Contingency Maintenance Cost Differences

Vehicle	Training		Contingency		% Difference
	Density	Avg Cost Per Mile	Density	Avg Cost Per Mile	
MRAP			1,954	4.02	
UAH	25,535	.95	4,774	1.10	87
LMTV	25,633	.64	12,655	1.14	56
MTV	16,418	.62	10,899	.93	67
Stryker	2,390	2.96	3,744	4.27	69
Avg Difference					70

SOURCE: OSMIS database.

Several of the alternatives analyzed also include some vehicles stored either temporarily or in APS fleets. To estimate the difference in operating costs between a vehicle in storage and one being used, the average annual cost for some HMMWVs, LMTVs, and MTVs in APS was compared to those in regular units. Table E.3 highlights cost data for vehicles in APS and non-APS. The vehicle types included in this table are those models that are prominently found in APS fleets. The average is weighted based on the number of vehicles in APS.

Table E.3
Costs of Storing Wheeled Vehicles

Model	Non-APS		APS		% Difference
	Density	Avg Cost	Density	Avg Cost	
M1025	6,390	3,323	490	1,207	36
M1097	17,553	2,578	443	642	25
M998	64,497	2,709	1,934	801	30
M1078	16,606	1,622	444	113	7
M1083	11,351	1,091	262	94	9
M1084	1,319	1,491	61	92	6

SOURCE: OSMIS database.

This data and other data collected on the fuel cost and fuel usage estimates for 2011 were used to estimate the model parameters displayed in Table E.4. Fuel costs included are those reported in the 2011 O&M budget. OSMIS provided the estimated fuel consumption rates for MRAPs and other vehicles.

Table E.4
Cost Model Parameters

MRAP Optempo	2,530
TWV Optempo	2,816
MRAP Cost per Mile	2.81
UAH Cost per Mile	1.10
MRAP Miles per Gallon	4
Fuel Cost per Gallon	3.03
Storage Cost Factor	25%

Finally, I estimated the potential future costs for the different options accounting for whether vehicles are integrated into organizational MTOEs, stored, or serve as substitutions. The cost for each option was estimated by summing the cost of MRAPs integrated into

brigades and MRAPs stored either in APS or in temporary storage, less the cost of vehicles substituted. O&M costs for vehicles used are the average price per mile times the number of miles expected to travel during training. Stored vehicles are assumed to cost 75 percent less to maintain and do not require fuel during the year. Potential deployment demands also influenced the way the Army would manage the MRAP fleet under Option 3 and Army Plan B. In these cases, I assumed that the Army would not fund operating costs of those vehicles from the annual budget. Thus, the cost estimate for these alternatives assumes that no MRAPs are deployed. Table E.5 highlights the estimated cost of each option.

Table E.5
Estimated Annual O&M Costs of MRAP Retention Options

Option	MRAPs	MTOE	Deployed	Storage	Veh Sub	O&M Costs
1	6,800	0	0	6,800	0	12M
2a	15,000	4,800 8,300	0	10,200 6,700	4,800 8,300	46M 60M
2b	15,000	4,800 8,300	0	10,200 6,700	0	62M 87M
3	11,000	0 11,000	0	11,000 0	0 6,800	20M 82M
Army A	15,000	6,000	0	9,000	6,000 0	51M 70M
Army B	16,700	0 16,700	0	16,700 0	0 9,400	30M 127M

The costs vary significantly for Option 3 and Army Plan B, which use the same equipment management strategy, based on the number of MRAPs integrated into Army force structure rather than put into storage. If the Army expects to train exclusively for major combat and chooses to temporarily store all MRAPs, then the costs are quite small and are comparable to Option 1. However, if the Army focuses on training for IW operations by allocating a large number of MRAPs to BCTs on an ongoing

basis, then the O&M costs associated with MRAPs increase significantly as their actual usage increases.

BIBLIOGRAPHY

Adams, Gordon, "Budgeting for Iraq and the GWOT," Testimony before the Committee on the Budget, United States Senate, February 7, 2007.

Adams, Gordon and Cindy Williams, *Buying National Security: How Much America Plans and Pays for Its Global Role and Safety at Home*, New York: Routledge, 2010.

Allawi, Ali A., *The Occupation of Iraq: Winning the War, Losing the Peace*, New Haven, Connecticut: Yale University Press, 2007.

AM General, "M1151A1 w/B1 HMMWV."

_____, "M1152A1 HMMWV."

_____, "M1165A1 HMMWV."

_____, "M1167 HMMWV."

Avdellas, Nicholas et al., *Future Capability of DOD Maintenance Depots*, Report LG901M2, McLean, VA: LMI, February 2011.

BAE Systems, "Caiman Light 4x4: FMTV Multi-Role Protected Vehicle," 2009.

_____, "Caiman 6x6: FMTV Multi-Role Protected Vehicle," 2009.

_____, "RG31: Mine Protected Armoured Personnel Carrier," 2008.

_____, "News Release: BAE Systems Completes Production of Mine Resistant Ambush Protected Vehicles," November 20, 2008.

Ballenstedt, Brittany R., "Senate Sends 3.9 Percent Pay Raise to President Bush," *Government Executive.com*, September 29, 2008.

Belasco, Amy, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11*, CRS Report RL33110, Washington, DC: Congressional Research Service, September 28, 2009.

_____, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11*, CRS Report RL33110, Washington, DC: Congressional Research Service, September 2, 2010.

_____, *The Cost of Iraq, Afghanistan, and Other Global War on Terror Operations Since 9/11*, CRS Report RL33110, Washington, DC: Congressional Research Service, March 29, 2011.

_____ and Larry Nowels, *Supplemental Appropriations FY2003: Iraq Conflict, Afghanistan, Global War on Terrorism, and Homeland*

Security, CRS Report RL31829, Washington, DC: Congressional Research Service, May 5, 2003.

Bertuca, Tony, "Army Wants to Divest 1,500 MRAPs; Two Variants," *InsideDefense.com*, January 27, 2011.

_____, "GD Not Worried As Harris Announces Integration Of Key Radio Waveform," *Inside the Army*, December 27, 2010.

_____, "Enterprise Business Model Praised As JTRS Waveform Completes Test," *Inside the Army*, February 7, 2011.

Bumiller, Elisabeth, "Threats and Responses: The Cost; White House Cuts Estimate of Cost of War with Iraq," *New York Times*, December 30, 2002.

Burt, Andrew, "MRAP Acquisition Model Not Replicable, Deputy Program Manger Says," *InsideDefense.com*, January 31, 2011.

Candrea, Philip J. and L.R. Jones, "Congressional Delegation of Spending Power to the Defense Department in the Post-9-11 Period," *Public Budgeting and Finance*, Vol. 25, No. 4, December 2005.

Casey, George W., "BCT Modernization: Versatile Capabilities for an Uncertain Future," February 19, 2010.

Child, Jeff, "Tech Recon: Tactical Radios Make Progress on All Fronts," *COTS Journal: The Journal of Military Electronics and Computing*, Vol. 12, No. 11, November 2010.

Chu, David S.C., Prepared Statement Before the Senate Armed Services Committee, *Caring for the Severely Wounded and the Families of Deceased Military Personnel*, February 1, 2005.

Clements, Dennis C. and Margaret A. Young, "The History of the Army's Logistic Civilian Augmentation Program: an Analysis of its Oversight from Past to Present," MBA Professional Report, Monterey, CA: Naval Post Graduate School, December 2005.

Congressional Budget Office, *Supplemental Appropriations in the 1970s*, Washington, DC: Congressional Budget Office, July 1981.

_____, *Supplemental Appropriations in the 1980s*, Washington, DC: Congressional Budget Office, February 1990.

_____, *Supplemental Appropriations in the 1990s*, Washington, DC: Congressional Budget Office, March 2001.

_____, *Estimated Costs of a Potential Conflict with Iraq*, Washington DC: Congressional Budget Office, September 30, 2002.

_____, *Cost Estimate: S.1050 National Defense Authorization Act for Fiscal Year 2004, As Passed by the Senate on May 22, 2003*, Washington, DC: Congressional Budget Office, June 2, 2003.

_____, *Recruiting, Retention, and Future Levels of Military Personnel*, Washington, DC: Congressional Budget Office, October 2006.

_____, *Replacing and Repairing Equipment Used in Iraq and Afghanistan: The Army's Reset Program*, Washington, DC: Congressional Budget Office, September 2007.

Congressional Quarterly, *2002 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2002.

_____, *2003 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2003.

_____, *2004 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2004.

_____, *2005 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2005.

_____, *2006 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2006.

_____, *2007 CQ Almanac*, Washington, DC: Congressional Quarterly Press, 2007.

Daggett, Stephen, *Military Operations: Precedents for Funding Contingency Operations in Regular or in Supplemental Appropriations Bills*, CRS Report RS22455, Washington, DC: Congressional Research Service, June 13, 2006.

_____ et al., *FY2004 Supplemental Appropriations for Iraq, Afghanistan and the Global War on Terrorism: Military Operations and Reconstruction Assistance*, CRS Report RL32090, Washington, DC: Congressional Research Service, November 13, 2003.

_____ et al., *FY2007 Supplemental Appropriations for Defense, Foreign Affairs, and Other Purposes*, CRS Report RL33900, Washington, DC: Congressional Research Service, July 2, 2007.

_____ et al., *FY2008 Spring Supplemental Appropriations and FY2009 Bridge Appropriations for Military Operations, International Affairs, and Other Purposes*, CRS Report RL34451, Washington, DC: Congressional Research Service, July 15, 2008.

_____ et al., *FY2009 Spring Supplemental Appropriations for Overseas Contingency Operations*, CRS Report R40531, Washington, DC: Congressional Research Service, July 15, 2009.

- Davis, Bob, "Bush Economic Aid Says Cost of Iraq War May Top \$100 Billion," *Wall Street Journal*, September 16, 2002.
- Davis, Paul K. and Paul Dreyer, *RAND's Portfolio Analysis Tool (PAT): Theory, Methods, and Reference Manual*, TR-756-OSD, Santa Monica, CA: RAND Corporation, 2009.
- Durbin, Richard, "Supplemental Appropriations Act to Support Department of Defense Operations In Iraq For Fiscal Year 2003," *Congressional Record 108th Congress (2003-2004)*, April 2, 2003.
- England, Gordon, Memorandum for Secretaries of the Military Departments, "Ground Rules and Process for FY '07 Spring Supplemental," October 25, 2006.
- Feickert, Andrew, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington, DC: Congressional Research Service, August 21, 2007.
- _____, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington, DC: Congressional Research Service, April 27, 2009.
- _____, *Mine-Resistant, Ambush-Protected (MRAP) Vehicles: Background and Issues for Congress*, CRS Report RS22707, Washington D.C.: Congressional Research Service, August 24, 2010.
- Fitzgerald, Erin K. and Anthony H. Cordesman, *Resourcing for Defeat: Critical Failures in Planning, Programming, Budgeting, and Resourcing the Afghan and Iraq Wars*, Washington, DC: Center for Strategic and International Studies, 2009.
- Force Protection, "Investor Presentation," January 2011.
- Gates, Robert M., *Speech: Space and Naval Warfare Center MRAP Facility*, January 18, 2008.
- _____, *Submitted Statement on DOD Challenges to the Senate Armed Services Committee*, January 27, 2009.
- _____, *Speech: Defense Budget Recommendation Statement*, April 6, 2009.
- _____, *Defense, Statement Submitted to the Senate Appropriations Committee-Defense*, June 16, 2010
- _____, *Speech: Opening Summary -- Senate Armed Services Committee (Budget Request)*, February 17, 2011.
- Gayl, Franz, *Mine Resistant Ambush Protected Vehicle (MRAP): Ground Combat Element Advocate Science and Technology Advisor Case Study*, January 22, 2008.

GovTrack.us, "S.Amend. 3075: To Provide Funds for Improvised Explosive Device Protection for Military Vehicles."

Grimmett, Richard F., *Congressional Use of Funding Cutoffs Since 1970 Involving U.S. Military Forces and Overseas Deployments*, CRS Report RS20775, Washington, DC: Congressional Research Service, January 10, 2001.

Harris Corporation, "Harris Corporation Receives \$24.5 Million Order from U.S. Army and U.S. Department of Defense for Falcon III Handheld and Vehicular Tactical Radio Systems."

_____, "AN/PRC-117G Wideband Networking in Action."

_____, "News Release: Harris Corporation and ITT Corporation Team to Accelerate Availability of Soldier Radio Waveform," October 22, 2010.

Heininger, Claire, "Diverse Radio Fleet, Dedicated Field Support Enhance Soldier Communications," May 3, 2011.

Hodge, Nathan, "Military Chiefs to Work on Cutting \$400 Billion," *Wall Street Journal*, June 17, 2011.

Hormats, Robert D., *The Price of Liberty: Paying for America's Wars from the Revolution to the War on Terror*, New York: Henry Holt and Company, 2007.

Hosek, Susan D., "TRICARE Reserve Select: Would Extending Eligibility to All Reservists be Cost Effective?," In Winkler, John D. and Barbara A. Bicksler, *The New Guard and Reserve*, San Ramon, CA: Falcon Books, 2008.

House Budget Committee, Democratic Staff, *Assessing the Cost of Military Action Against Iraq: Using Desert Shield/Desert Storm as a Basis for Estimates*, Washington DC: House Budget Committee, September 23, 2002.

Inside the Navy, "MRAP Rollover and Tipping Problem Bigger than Previous Data Suggests," *Inside the Navy*, November 1, 2010.

Ippolito, Dennis S., "Budget Policy, Deficits, and Defense: A Fiscal Framework for Defense Planning," Carlisle, PA: Strategic Studies Institute, June 2005.

The Iraq Study Group, *The Iraq Study Group Report: The Way Forward - A New Approach*, New York: Vintage Books, 2006.

Irwin, Paul M. and Larry Nowels, *FY2006 Supplemental Appropriations: Iraq and Other International Activities; Additional Hurricane Katrina Relief*, CRS Report RL33298, Washington, DC: Congressional Research Service, June 15, 2006.

Jane's Defence Industry, "GDLS Canada Secures MRAP Category II Deal with U.S. DOD," September 1, 2007.

_____, Ben Goodlad, "MRAP Manufacturers Rev Up for M-ATV Competition," January 16, 2009.

Jane's Defence Weekly, "MRAPs on the March: MRAP Development," May 27, 2008.

_____, "Protected Markets: MRAPs," September 25, 2009.

Johnson, Stuart et al., *A Review of the Army's Modular Force Structure*, TR-927-1-OSD, Santa Monica, CA: RAND Corporation, 2011.

Joint Program Executive Office, Joint Tactical Radio System, "News Release: JTRS SRW Network Manager Successfully Completes FQT," February 2, 2011.

Jones, L.R. and Jerry McCaffery, *Budgeting, Financial Management, and Acquisition Reform in the U.S. Department of Defense*, Charlotte, North Carolina: Information Age Publishing, 2007.

Kelly, Terrence K. et al., *The U.S. Combat and Tactical Wheeled Vehicle Fleets - Issues and Suggestions for Congress*, MG-1093-OSD, Santa Monica, CA: RAND Corporation, 2011.

Kettl, Don F., Foreword, *The New Politics of the Budgetary Process*, Fifth Edition, New York: Pearson/Longman, 2004.

Kiewiet, D. Roderick and Matthew McCubbins, "Appropriations Decisions as a Bilateral Bargaining Game between President and Congress," *Legislative Studies Quarterly*, Vol. 10, No. 2, May 1985, 181-201.

_____, "Presidential Influence on Congressional Appropriations Decisions," *American Journal of Political Science*, Vol. 32, No. 3, August 1988, 713-736.

Kranc, Ryan T., "MRAP Future Discussion Paper," *Small Wars Journal*, February 11, 2011, accessed March 8, 2011:
<http://smallwarsjournal.com/blog/journal/docs-temp/676-kranc.pdf>

Krepinevich, Andrew F. and Dakota L. Wood, *Of IEDs and MRAPs: Force Protection in Complex Irregular Operations*, Washington D.C.: Center for Strategic and Budgetary Assessments, 2007.

Lamb, Christopher J., Matthew J. Schmidt, and Berit G. Fitzimmons, *MRAPs, Irregular Warfare, and Pentagon Reform*, Washington D.C.: National Defense University Press, June 2009.

Lewis, Matthew W. et al., *New Equipping Strategies for Combat Support Hospitals*, RAND Corporation MG-887-A, Santa Monica, California: RAND Corporation, 2010.

- Livingston, Ian S., Heather L. Messera, and Michael E. O'Hanlon, *Afghanistan Index: Tracking Variables of Reconstruction and Security in Post-9/11 Afghanistan*, Washington D.C.: Brookings Institution, December 31, 2010.
- Mackin, Patrick, Richard Parodi, and Mark Dye, *Review of Military Death Benefits Final Report*, Annandale, VA: SAG Corporation, April 20, 2004.
- McQuillan, Laurence, "White House Can't Say How Much a New Iraq War Would Cost," *USA Today*, January 16, 2003.
- Military Persiscope.com, "Cougar Mine-Resistant Vehicle," February 1, 2010.
- Miller, Richard M., *Funding Extended Conflicts: Korea, Vietnam, and the War on Terror*, Westport, Connecticut: Praeger Security International, 2007.
- National Commission on Fiscal Responsibility and Reform, *The Moment of Truth*, Washington, DC: White House, December 2010.
- Navistar International Corporation, "Navistar Defense Begins Producing MaxxPro Dash; To Reach Full Production by Mid-October," October 2, 2008.
- _____, "International MaxxPro."
- Nordhaus, William D., "The Economic Consequences of a War with Iraq," in Kaysen, Carl et. al., *War with Iraq: Costs, Consequences and Alternatives*, Cambridge, MA: American Academy of Arts and Sciences, 2002.
- O'Hanlon, Michael E. and Ian Livingston, *Iraq Index: Tracking Variables of Reconstruction and Security in Post-Saddam Iraq*, Washington D.C.: Brookings Institution, December 31, 2010.
- Oshkosh Defense, "MRAP All-Terrain Vehicle: M-ATV," 2010.
- _____, "Family of Medium Tactical Vehicles: FMTV / Cargo 4x4/6x6," 2010.
- Philpott, Tom, "Military Update: Benefits Could Increase for Survivors of Troops Killed in Iraq, Afghanistan," *Stars and Stripes*, January 16, 2005.
- Rubin, Irene, "Budgeting During the Bush Administration," *Public Budgeting and Finance*, Vol. 21, No. 3, Fall 2009.
- Saad, Lydia, "Americans' Confidence in Military Up, Banks Down," Gallup, June 14, 2009.
- Schatz, Thomas, "Pork Goes to War," *New York Times*, March 30, 2007.

- Schick, Allan, *The Federal Budget: Politics, Policy, Process*, Third Edition, Washington, DC: Brookings Institution Press, 2007.
- Serafino, Nina M., *Peacekeeping: Issues of U.S. Military Involvement*, Washington, DC: Congressional Research Service, December 13, 2001.
- Sinclair, Wayne A., "Answering the Landmine," *Marine Corps Gazette*, Volume 80, Number 7, July 1996.
- Stafford, Thomas J., "The MRAP Vehicle: The New Icon of Operation Iraqi Freedom," *Infantry Magazine*, November-December 2007.
- Stollenwerk, Michael, "LOGCAP: Can Battlefield Privatization and Outsourcing Create Tactical Synergy?," Fort Leavenworth, KS: School of Advanced Military Studies, December 1998.
- Strickland, James, *Briefing: MRAP Vehicles - Rapid Acquisition to Organic Maintenance Support*, 2010 DOD Maintenance Symposium.
- Thales Communications Inc., "AN/PRC-148 MBITR."
- U.S. Congress, *Making Emergency Supplemental Appropriations for Fiscal Year 2001 for Additional Disaster Assistance, for Anti-Terrorism Initiatives, and for Assistance in the Recovery from the Tragedy that Occurred on September 11, 2001, and for Other Purposes*, P.L. 107-38, 2001.
- _____, *Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2002, and for Other Purposes*, P.L. 107-117, 2002.
- _____, *Making Emergency Supplemental Appropriations for Further Recovery from and Response to Terrorist Attacks on the United States for the Fiscal Year ending September 30, 2002*, P.L. 107-206, 2002.
- _____, *Making Emergency Wartime Supplemental Appropriations for the Fiscal Year 2003, and Other Purposes*, P.L. 108-11, 2003.
- _____, *Making Emergency Supplemental Appropriations for Defense and for the Reconstruction of Iraq and Afghanistan for the Fiscal Year Ending September 30, 2004, and for Other Purposes*, P.L. 108-106 2004.
- _____, *National Defense Authorization Act for Fiscal Year 2004*, P.L. 108-136, Sec. 647, 2003.
- _____, *Making Emergency Supplemental Appropriations for Defense and for the Reconstruction of Iraq and Afghanistan for the Fiscal Year Ending September 30, 2004 and for Other Purposes*, P.L. 108-287, 2004.
- _____, *Ronald Reagan National Defense Authorization Act for Fiscal 2005*, P.L. 108-375, 2005.

_____, *Making Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Tsunami Relief*, 2005, P.L. 109-13, 2005.

_____, *Servicemembers' Group Life Insurance Enhancement Act of 2005*, P.L. 109-80, September 30, 2005.

_____, *Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act, 2006. Department of Defense Appropriations Act, 2006*, P.L. 109-148, 2005.

_____, *National Defense Authorization Act for Fiscal Year 2006*, P.L. 109-163, Sec. 664, January 6, 2006.

_____, *Emergency Supplemental Appropriations Act for Defense, the Global War on Terror and Hurricane Recovery, 2006*, P.L. 109-234, 2006.

_____, *Department of Defense Appropriations Act, 2007*, P.L. 109-289, 2006.

_____, *John Warner FY 2007 National Defense Authorization Act*, P.L. 109-364, 2006.

_____, *U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007*, P.L. 110-28, 2007.

_____, *Post-9/11 Veterans Educational Assistance Act of 2007*, S.22, 2007.

_____, *Making Continuing Appropriations for the Fiscal Year 2008, and for Other Purposes*, P.L. 110-92, 2007.

_____, *Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2008, and for Other Purposes*, P.L. 110-116, 2007.

_____, *Consolidated Appropriations Act, 2008*, P.L. 110-161, 2007.

_____, *Supplemental Appropriations Act, 2008*, P.L. 110-252, 2008.

_____, *Supplemental Appropriations Act, 2009*, P.L. 111-32, 2009.

_____, *Department of Defense Appropriations Act, 2010*, P.L. 111-118, 2009.

_____, *Supplemental Appropriations Act, 2010*, P.L. 111-212, 2010.

_____, *Department of Defense and Full-Year Continuing Appropriations Act, 2011*, P.L. 112-10, 2011.

U.S. Department of the Army, *2007 Army Modernization Plan*, Washington D.C.: Department of the Army, March 2007.

- _____, *Armor/Cavalry Reference Data: Brigade Combat Teams*, FKSM 71-8, Fort Knox: U.S. Army Armor Center, April 2008.
- _____, Deputy Chief of Staff - G-4, *Army Depot Maintenance Enterprise: Strategic Plan 2008 - 2025*, Washington, DC: Department of the Army, April 2008.
- _____, *Fielding and Use of the Mine Resistant Ambush Protected Vehicles at Army Installations in the United States*, Washington D.C.: Department of the Army, June 2009.
- _____, Deputy Chief of Staff - G-8, *The Army Tactical Wheeled Vehicle Investment Strategy*, Washington, DC" U.S. Army, October 2009.
- _____, *Army Equipping Strategy*, Washington D.C.: Department of the Army, 2009.
- _____, "Informational Paper: Mine Resistant Ambush Protected Vehicles," *Army Posture Statement 2010*, 2010.
- _____, *Fiscal Year 2011 Budget Estimates: Volume I: Operation and Maintenance*, Army, Washington, DC: Department of the Army, February 2010.
- _____, *2010 Army Modernization Strategy*, Washington D.C.: Department of the Army, April 2010.
- _____, *Armor/Cavalry Reference Data: Brigade Combat Teams*, FKSM 71-8, Fort Knox: U.S. Army Armor Center, May 2010.
- _____, *Army Truck Program (Tactical Wheeled Vehicle Acquisition Strategy)*, *Report to the Congress*, Washington D.C.: Department of the Army, June 2010.
- U.S. Department of Defense, *Overseas Contingency Operations Transfer Fund, FY2002 Amended Budget Submission*, Washington, DC: Department of Defense, June 2001.
- _____, *FY2002 Supplemental Request to Continue the Global War on Terrorism*, Washington, DC: Department of Defense, March 2002.
- _____, Undersecretary of Defense for Acquisition, Technology, and Logistics, *Department of Defense Priorities and Allocations Manual*, DOD 4400.1-M, February 2002.
- _____, *FY2004 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Noble Eagle*, Washington, DC: Department of Defense, September 2003.
- _____, *FY2005 Supplemental Request for Operation Iraqi Freedom, Operation Enduring Freedom, and Operation Unified Assistance*, Washington, DC: Department of Defense, February 2005.

- _____, *FY2006 Supplemental Request for Operation Iraqi Freedom and Operation Enduring Freedom*, Washington, DC: Department of Defense, February 2006.
- _____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2006 Report to Congress*, Washington D.C.: Department of Defense, 2006.
- _____, *FY2007 Emergency Supplemental Request*, Washington, DC: Department of Defense, February 2007.
- _____, *Amendment to FY2007 Emergency Supplemental Request*, Washington, DC: Department of Defense, March 2007.
- _____, *Fiscal Year 2008 Global War on Terror Request*, Washington, DC: Department of Defense, February 2007.
- _____, *FY2008 Budget Amendment for Global War on Terror Request Budget Justification: Mine Resistant Ambush Protected Vehicles*, Washington, DC: Department of Defense, July 2007.
- _____, *FY2008 Global War on Terror Amendment*, Washington, DC: Department of Defense, October 2007.
- _____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2007 Report to Congress*, Washington D.C.: Department of Defense, 2007.
- _____, *Fiscal Year 2009 Global War on Terror Request*, Washington, DC: Department of Defense, May 2008.
- _____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2008 Report to Congress*, Washington D.C.: Department of Defense, 2008.
- _____, *Fiscal Year 2009 Supplemental Request*, Washington, DC: Department of Defense, April 2009.
- _____, *Budget Amendment to the FY 2010 President's Budget Request for Overseas Contingency Operations (OCO)*, Washington, DC: Department of Defense, August 2009.
- _____, News Release, "DOD Announces Recruiting and Retention Numbers for Fiscal 2009," October 13, 2009.
- _____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2009 Report to Congress*, Washington D.C.: Department of Defense, 2009.
- _____, *Fiscal Year (FY) 2011 Overseas Contingency Operations (OCO) Request, FY 2010 Supplemental Request*, Washington, DC: Department of Defense, February 2010.

_____, *Quadrennial Defense Review Report*, Washington, DC: Department of Defense, February 2010.

_____, *Draft Purchase Description for Joint Light Tactical Vehicle Family of Vehicles*, Version 2.3, Washington D.C.: Department of Defense, April 2010.

_____, "Justification for Component Contingency Operations and the Overseas Contingency Operations Transfer Fund," *Fiscal Year 2011 Budget Estimates*, Washington, DC: Department of Defense, 2010.

_____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2010 Report to Congress*, Washington D.C.: Department of Defense, 2010.

_____, *Defense Health Program: Fiscal Year (FY) 2012 Budget Estimates, Volume I: Justification of Estimates*, Washington, DC: Department of Defense, January 2011.

_____, *Fiscal Year 2012 Budget Estimates: Mine Resistant Ambush Protected (MRAP) Fund*, Washington, DC: Department of Defense, February 2011.

_____, *United States Department of Defense Fiscal Year 2012 Budget Request*, Washington, DC: Department of Defense, 2011.

_____, Health Program Analysis and Evaluation Directorate, *Evaluation of TRICARE Program Fiscal Year 2011 Report to Congress*, Washington D.C.: Department of Defense, 2011.

_____, *National Defense Budget Estimates for FY2012*, Washington, DC: Department of Defense, March 2011.

U.S. Department of Veterans Affairs, "Service Members' and Veterans' Group Life Insurance," November 30, 2010.

U.S. Executive Office of the President, Office of Management and Budget, *Fiscal Year 2000 Budget of the United States Government*, Washington, DC: Government Printing Office, 1999.

_____, *Fiscal Year 2001 Budget of the United States Government*, Washington, DC: Government Printing Office, 2000.

_____, *Fiscal Year 2002 Budget of the United States Government*, Washington, DC: Government Printing Office, 2001.

_____, *Fiscal Year 2003 Budget of the United States Government*, Washington, DC: Government Printing Office, 2002.

_____, *Fiscal Year 2004 Budget of the United States Government*, Washington, DC: Government Printing Office, 2003.

_____, *Fiscal Year 2005 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2004.

_____, *Fiscal Year 2006 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2005.

_____, *Fiscal Year 2007 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2006.

_____, *Fiscal Year 2008 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2007.

_____, *Fiscal Year 2009 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2008.

_____, *Fiscal Year 2010 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2009.

_____, "Criteria for War/Overseas Contingency Operations Funding
Requests," Washington, DC: Office of Management and Budget, July
2010.

_____, *Fiscal Year 2011 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2010.

_____, *Fiscal Year 2012 Budget of the United States Government*,
Washington, DC: Government Printing Office, 2011.

U.S. General Accounting Office, *DOD Budget: Analysis of Options for
Funding Contingency Operations*, GAO/NSIAD-94-152BR, Washington, DC:
General Accounting Office, 1994.

U.S. Government Accountability Office, *Military Personnel: Survivor
Benefits for Servicemembers and Federal, State, and City Government
Employees*, GAO-04-814, Washington, DC: GAO, July 2004.

_____, *Military Operations: Fiscal Year 2004 Costs for the Global War on
Terrorism Will Exceed Supplemental, Requiring DOD to Shift Funds from
Other Uses*, Washington, DC: GAO, July 23, 2004.

_____, *Defense Logistics: Actions Needed to Improve the Availability of
Critical Items during Current and Future Operations*, GAO-05-275,
Washington, DC: GAO, April 2005.

_____, *Defense Logistics: Several Factors Limited the Production and
Installation of Army Truck Armor during Current Wartime Operations*,
GAO-06-160, Washington D.C.: GAO, March 2006.

_____, *Military Health: Cost Data Indicate That TRICARE Reserve Select
Premiums Exceeded the Costs of Providing Program Benefits*, GAO-08-
104, Washington, DC: GAO, December 2007.

- _____, *Defense Acquisitions: Rapid Acquisition of Mine Resistant Ambush Protected Vehicles*, GAO-08-884R, Washington, DC: GAO, July 15, 2008.
- _____, *Defense Budget: Independent Review Is Needed to Ensure DOD's Use of Cost Estimating Tool for Contingency Operations Follows Best Practices*, GAO-08-982, Washington, DC: GAO, September 2008.
- _____, *Defense Acquisitions: Rapid Acquisition of MRAP Vehicles*, GAO-10-155T, Washington, DC: GAO, October 8, 2009.
- _____, *Defense Acquisitions: Issues to be Considered as DOD Modernizes Its Fleet of Tactical Wheeled Vehicles*, GAO-11-83, Washington, DC: GAO, November 2010.
- _____, *Defense Acquisitions: Assessment of Selected Weapon Programs*, GAO-11-233SP, Washington, DC: GAO, March 2011.
- Vanden Brook, Tom, "Autumn Will be Crucial Time for MRAP Project," *U.S.A Today*, July 19, 2007.
- Wildavsky, Aaron and Naomi Caiden, *The New Politics of the Budgetary Process*, Fifth Edition, New York: Pearson/Longman, 2004.
- Williams, Cindy, "The U.S. Defense Budget," Testimony before the Committee on the Budget, United States Senate, February 23, 2010.
- Wlezien, Christopher, "The Political Economy of Supplemental Appropriations," *Legislative Studies Quarterly*, Vol. 18, No. 1, February 1993.
- _____, "The President, Congress, and Appropriations, 1951-1985," *American Politics Research*, Vol. 24, No.1, January 1996.
- Wong, Carolyn et al., *Army Tactical Wheeled Vehicles: Current Fleet Profiles and Potential Strategy Implications*, Santa Monica, CA: RAND Corporation, TR-890-A, 2011.