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How Much Will Be Enough?

Assessing Changing Defense Strategies'
Implications for Army Resource Requirements

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Duncan Long, Anny Wong

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Preface

In the lexicon of the Departments of Defense and Army, *strategy* is the process of combining available means in various ways in order to achieve the ends established by national policy. In order to devise appropriate strategies, Department of Defense (DoD) leaders must be able to assess their costs with some degree of accuracy. DoD has powerful, if ponderous, methods for performing such assessments, loosely grouped under the rubric of the Planning, Programming, Budgeting and Execution (PPBE) system. These methods are best suited to providing precise estimates of the resources required to implement incremental change in a relatively stable security environment. Defense strategy can change substantially and suddenly, however, for reasons beyond policymakers' control. Just to offer one example, the September 11 attacks derailed the "Transformation" strategy developed in the course of the 2001 Quadrennial Defense Review. That strategy itself represented a significant shift. Therefore, DoD leaders need responsive methods for assessing alternative strategies' costs.

This monograph describes such a method, the Strategic Investment Analysis Protocol (SIAP). SIAP follows much of the same logic used in existing processes for assessing strategies' resource implications, particularly those used in Total Army Analysis. It abbreviates the analysis, however, to allow decisionmakers to explore alternatives before selecting one or more of the most robust alternatives for further development. In particular, SIAP focuses on the Army context. To the extent that this research breaks new ground, it does so with respect to an analysis of how strategy affects costs for the Army's generating force. This method is likely to be most useful at the beginning of the planning phase of the PPBE cycle.

Readers will find some familiarity with existing defense planning processes useful in following this report. We have tried to explain terms and references clearly, in plain English. Such explanations are necessarily brief.

The study leading to this monograph built on another set of 2009 RAND studies.¹ Those studies explained how Defense Department officials and senior joint military leaders can assess the expected results, costs, and risks in the consideration of alternative national defense strategies. Noting this earlier work, the U.S. Army Training and

¹ See Paul K. Davis, Stuart E. Johnson, Duncan Long, and David C. Gompert, *Developing Resource-Informed Strategic Assessments and Recommendations*, Santa Monica, Calif.: RAND Corporation, MG-703-JS, 2008, referred to hereafter as Davis et al., 2008. See also David C. Gompert, Paul K. Davis, Stuart E. Johnson, and Duncan Long, *Analysis of Strategy and Strategies of Analysis*, Santa Monica, Calif.: RAND Corporation, MG-718-JS, 2008, referred to hereafter as Gompert et al., 2008.

Doctrine Command's (TRADOC's) Army Capabilities Integration Center (ARCIC) asked RAND's Arroyo Center to undertake this study.

The research described in this monograph took place in late 2008 and 2009. RAND is publishing it now for a wider audience because the methods described herein continue to demonstrate their utility. Those methods have evolved since the original study, and this report reflects that evolution. However, the authors have not attempted to update the rest of the research describing contemporary issues, background and context.

The study on which this report is based has been conducted within the Strategy, Doctrine, and Resources Program of the RAND Arroyo Center, a federally funded research and development center.

The Project Unique Identification Code (PUIC) for the project that produced this document is ATFCR08938.

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Summary

The Army must be able to assess the implications of choices and changes of national defense strategy for the resources it needs and how it allocates them. Department of Defense (DoD) officials' perceptions of defense strategies' likely costs will weigh heavily in their assessment of alternative strategies' utility. Ergo, the Army and other force providers owe it to DoD to explain resource implications while such alternative strategies are under consideration—such as during a Quadrennial Defense Review—rather than after one has been adopted.

Current cost assessment processes, however, take months to generate results and require considerable resources to execute. Although these processes result in precise, reasonably accurate estimates of costs for a particular strategy after it has been adopted, they cannot produce a responsive, preliminary estimate in time to influence the selection of that strategy.

Moreover, decisionmakers and the analysts who support them lack tools for estimating aggregate generating force costs. The Army does have tools for estimating generating force manpower requirements and processes for establishing budgetary needs, but these tools and processes are scattered among multiple organizations, at multiple levels of responsibility. They are not readily available to support responsive, first-order estimates of alternative strategies' costs. This is especially important given that generating force activities consume around half of the Army's budget.

For these reasons, the Army asked RAND's Arroyo Center to develop and convey a method to estimate changes in Army resource needs and allocation as a function of choice among alternative national defense strategies. A chain of strategic analysis enables cost estimation, as described in earlier RAND publications. This report builds on the earlier work to focus on cost estimation, with particular emphasis on the generating force. Through analysis of historical data, both quantitative and documentary, we were able to develop an approach to estimating generating force costs. Combined with extant tools for assessing operational Army costs, this approach enables analysts to develop responsive, first-order estimates of defense strategies' cost implications for the Army.

Research Approach

Our method, the Strategic Investment Analysis Protocol (SIAP), builds on earlier RAND work for the Joint Staff J-8.² SIAP allows analysts and decisionmakers to compare and contrast alternative strategies. It consists of seven steps, depicted in Figure S.1 and explained in the following bulleted paragraphs:

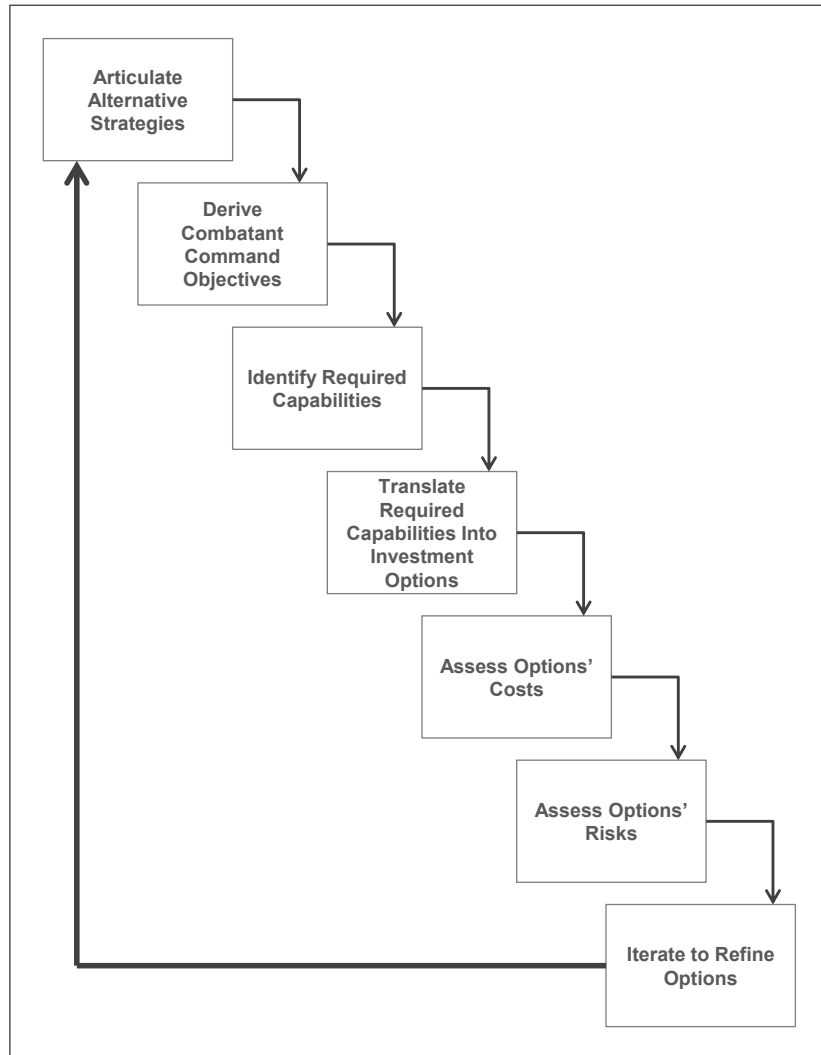
- Articulate alternative strategies in terms of strategic goals, overall approach, and the general implications for means to be used.
- From these strategic goals, derive specific objectives for each combatant command.
- Identify capabilities that each combatant command needs to achieve these objectives.
- Develop investment options that translate required capabilities into specific forces and programs. These investment options aggregate the capabilities needed by each combatant command into a single investment option.
- Estimate investment options' costs.
- Compare investment options' risks relative to one another.
- Iterate to improve strategy in light of implications and core strengths.³

For the purposes of this study, we were primarily concerned with the fifth and sixth steps—assessing the costs and risks associated with the alternative armies implied by alternative defense strategies. Doing so required us to decompose the problem according to the Army's two functionally distinct but organizationally integrated components: the operational Army and the generating force. The operational Army provides most of the forces used by combatant commands to implement the defense strategy, but those forces are insufficient for that purpose without support from the generating force. In order to be useful, operational Army forces must be organized, trained, and equipped for a particular operational environment; deployed to theater; and sustained while there by the generating force. The Army requires enough resources to fund both forces and their support.

² Davis et al., 2008; Gompert et al., 2008.

³ Gompert et al., 2008, p. 14. This approach reflects the strategies-to-tasks approach described in David E. Thaler, *Strategies to Tasks: A Framework for Linking Means and Ends*, Santa Monica, Calif.: RAND Corporation, MR-300-AF, 1993. It is also consistent with existing defense and service approaches to deriving costs from strategy, as described in the Introduction. Other RAND work addresses the initial analytic support to the planning aspect of PPBS but focuses on the modernization domain. See Glenn A. Kent and David Thaler, *A New Concept for Streamlining Up-Front Planning*, Santa Monica, Calif.: RAND Corporation, MR-271-AF, 1993.

Figure S.1: RAND Approach for Relating Resources to Strategy: The Strategic Investment Analysis Protocol (SIAP)



Generating Alternative Strategies

To illustrate our approach, we used three alternative strategies developed for our previous research. We describe them briefly below, because the discussion can be difficult to follow otherwise. We present them in greater detail in Chapter 2.

- ***Direct Counterinsurgency (COIN)***. This strategy is our analytic baseline, and approximates the strategy that was current at the time of this study. The Direct COIN strategy assumes that the primary threats to the United States arise from instability, which allows terrorism and other problems to flourish. The only effective way to mitigate these risks is through direct intervention, at a large scale, to defeat terrorists and associated insurgent groups and stabilize their parent

societies. It requires a large Army capable of sustaining combat operations indefinitely against technologically inferior foes.

- ***Build Local Defend Global.*** Like the Direct COIN strategy, this strategy assumes that the primary threats to the United States arise from instability. In contrast to the Direct COIN strategy, it assumes that the United States can mitigate these threats by prophylactic engagement to develop partners' capabilities for governance, broadly considered. DoD would be particularly concerned with partners' security forces. A distinct feature of the Army for this study would be an Advisory Corps organized for this express purpose.
- ***Rising Peer.*** Unlike either of the above alternatives, this strategy assumes that only a major peer or near-peer competitor can threaten the security of the United States. Hence, this strategy seeks to develop and maintain capabilities to deter such potential adversaries and shape their strategic choices in a direction that avoids military competition and confrontation with the United States. The Army supporting this strategy will be technologically advanced, highly deployable, and oriented on traditional combat operations.

For each alternative, we define a set of objectives and force requirements for each combatant command. We then aggregate those requirements into an operational Army force structure. We also derive assumptions about the nature of the generating force that supports that operational Army force structure and the strategy itself. *We should note that the point of this study, however, was to develop and demonstrate an approach to assessing the resource implications of various strategies, not to recommend a particular strategy or associated force structure.*

Assess Options' Costs

We found it helpful to assess options' costs for the operational Army and the generating force separately. These two parts of the Army incur costs differently, according to different dynamics. The Army budget's structure provides an integrating framework.

The Army's budget is broken down into appropriations, budget activities, and sub-activity groups (SAGs). There are five major appropriations:

- Military Personnel
- Operations and Maintenance
- Research, Development, Test and Evaluation
- Procurement
- Military Construction.

In turn, each appropriation is broken down into budget activities and sub-activity groups. This decomposition is particularly important with respect to the operations and maintenance appropriation. That appropriation consists of four major budget activities (BAs):

- BA-1: Operating Forces
- BA-2: Mobilization
- BA-3: Training and Recruiting
- BA-4: Administration and Servicewide Activities.

Each budget activity consists of several SAGs. Each SAG describes a particular function or program. Within BA-1, for example, SAG 131, Base Operations, funds operations and maintenance requirements to operate installations.

BA 137, Reset, funds the Army's repair and reconditioning of equipment worn or damaged in battle.

Operational Army costs include a proportion of military personnel costs, all procurement costs, and those costs described by five of the fifteen SAGs in BA-1, "Operating Forces." Operational Army military personnel costs are a function of the number, specialty, and grade of soldiers authorized to operational Army units. Operational Army operations and maintenance costs include those costs necessary to fund unit-level operations, especially training.

The rest of the budget describes generating force costs. With the exception of the five SAGs that indicate operational Army costs, the rest of the Operations and Maintenance, Army (OMA) appropriation describes generating force costs. We attribute all research, development, test and evaluation (RDTE) and military construction costs to the generating force. We also attribute to the generating force a portion of military personnel costs proportional to the generating force's assigned military manpower. We will provide further detail on how we aligned the Army budget with the operational Army and generating force in Chapter 2.

Techniques to estimate operational Army costs are well developed. Operational Army costs include operations and maintenance costs associated with operational Army units, along with associated military personnel and procurement costs. Once analysts determine the number and type of forces required, the Army has mature tools for assessing those forces' operations and support costs. For our analysis, we relied heavily on one such tool, the Office of the Assistant Secretary of Army for Financial Management and Comptroller's (OASA (FM&C)'s) Force and Organization Cost Estimating System (FORCES).⁴ The FORCES Cost Model estimates required operations and support requirements for operational Army units. In particular, we used FORCES' estimates of alternative armies' Direct Equipment, Parts and Fuel (DEFL) and Indirect Support costs.

⁴ OASA (FM&C) graciously provided the data directly to the study team for our investigation. For information on the FORCES suite of models, see U.S. Army, Office of the Assistant Secretary of the Army (Financial Management and Comptroller), "Forces Information," November 2010. As of May 19, 2013: <http://asafm.army.mil/offices/CE/ForcesInfo.aspx?OfficeCode=1400>

In combination, those two cost elements equate to operations and maintenance requirements for operational Army units. FORCES' estimates of the resources required to pay associated military personnel and to replace the capital inventory associated with an alternative force structure were also important to our analysis. We describe this approach at greater length in Chapter 3.

Most of the Army's budget records the costs to organize, man, train and equip those forces. Those functions are the province of the Army's generating force. The budget's different appropriations and sub-activity groups more or less align with generating force core processes and core capabilities as described by Department of the Army Pamphlet 100-1, *Force XXI Institutional Army Redesign*, 1998.

To understand how those costs might vary under alternative strategies, we examined how the different SAGs and appropriations have responded to past changes in strategy and conditions. Through that analysis, the research team was able to identify a limited set of factors that seemed to govern generating force costs. We then developed models incorporating those variables to estimate generating force costs by SAG or, where possible, by appropriation. That analysis involved an extensive review of the documentary evidence presented in Army budget justification documents and statistical analysis correlating SAG execution with changes in the variables identified above, as well as other potential variables. The documentary evidence was particularly important, in that it provided the specific rationale for specific variations in costs. This evidence indicated what kinds of variables might drive requirements for each SAG, informing our quantitative analysis. When our quantitative analysis of requirements within a SAG was both consistent with this qualitative analysis and did not appear to be statistically invalid, we adopted the resulting multivariate regression model. When the statistical analysis was ambiguous or contradicted by the documentary evidence, we built our model based on the latter.

Assessing Options' Risks

Assessing investment options' potential effectiveness is a critical component of SIAP. The fact that analysts develop an option to support a particular strategy is no guarantee that the option serves its purpose. In the Interwar Period, the French Army meticulously designed itself to defend France against a German onslaught. It failed spectacularly. Ergo, it is necessary to assess options' capabilities and capacity against the requirements of the strategy for which it was designed. The Multi-Service Force Deployment Documents (MSFDDs) of the Office of the Secretary of Defense's (OSD's) Analytic Agenda, integrated into Integrated Security Constructs (ISCs) aligned with each alternative strategy, comprise the tool for making such assessments. Our illustrative

analyses omit this assessment, because the MSFDDs are classified, but Army analysts should not omit it.

Equally important, if not more so, analysts should also assess alternative strategies against the requirements of several alternative futures, to hedge against the risk that the assumptions underpinning a particular strategy turn out to be wrong. Indeed, according to former Secretary of Defense Robert Gates, such assumptions will inevitably be wrong.

Analysts should use the results of these assessments to refine investment options and iterate the analysis. Prudent Army analysts and decision makers seek to develop an Army that is “least badly wrong” across a range of potential strategies and future security environments. Such options are “robust” against potential shocks.

Using SIAP

This study demonstrates that it is possible develop relatively accurate, first-order estimates of the resource implications for the Army of alternative defense strategies. Such estimates should inform the development and selection of defense strategies and the Army investment options that support those strategies. We are confident that the method proposed in this report, the Strategic Investment Analysis Protocol (SIAP), provides a reliable method for doing so. It requires relatively little manpower to implement, at least relative to the PPBS processes that it mimics. It allows a small team of analysts to provide responsive, confidential analysis to decision makers during the critical, early phases of the decision process. Service planners may envision improvements to this method, or even entirely different approaches to the same problem. Regardless of the method employed, the important thing is to integrate this kind of strategic analysis at an early stage. Doing so allows officials to choose a strategy with a reasonable understanding of its potential resource implications.

We developed SIAP to provide Defense and Army leaders with the means to assess alternative strategies’ costs and risks before the Department commits itself to a specific alternative. In the normal course of strategy and program development, SIAP can inform the Army’s evolution of its Army Strategic Planning Guidance (ASPG) and the Army Programming Guidance Memorandum. It could also enable senior leaders to provide more precise guidance with which to initiate the force management requirements process, which includes but is not limited to the Requirements phase of Total Army Analysis (TAA).

Changes in strategy honor normal PPBS processes in the breach as much as in the observance, however. Examples of such major discontinuities include General Peter Schoomaker’s initiation of the Army’s modular transformation, or adoption of the “surge” strategy in Iraq with the concomitant decision to grow the Army. In such cases,

being able to assess alternatives' inherent costs and risks rapidly becomes even more important.

With this in mind, SIAP trades precision and accuracy for responsiveness. SIAP cannot, therefore, substitute for ordinary PPBS processes in providing the detailed and specific analysis of what it will actually take to implement a particular strategy. We also note that SIAP's orientation on the mid- to long-term future make it difficult to validate. We can say, however, is that it will provide consistent estimates that are grounded in historical data. That is, SIAP provides relatively accurate, first-order estimates of alternative strategies' costs and risks to help policymakers select and refine a strategy from among plausible options.

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Abbreviations

ABCT	airborne brigade combat team
ACM	Army Contingency Operations Cost Model
AFRICOM	U.S. African Command
ACR	Armored Cavalry Regiment
AMC	Army Materiel Command
AOR	Area of Responsibility
APS	Army prepositioned stocks
ARCENT	U.S. Army Central
ARCIC	Army Capabilities Integration Center
ARNG	Army National Guard
ARSTRAT	U.S. Army Forces Strategic Command (Space and Missile Defense Command)
ARSTRUC	Army Structure Memorandum
ASC	U.S. Army Acquisition Support Center
ASCC	Army Service Component Command
ATEC	U.S. Army Test and Evaluation Command
AWG	Asymmetric Warfare Group
BA	Budget Activity
BCT	brigade combat team
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosives
CENTCOM	U.S. Central Command
CFH	The Army Cost and Factors Handbook
CID	U.S. Army Criminal Investigation Command
COCOM	Combatant Command
COIN	Counterinsurgency
DEFL	Direct Equipment, Parts and Fuel
DoD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Material, Leader Development and Education, Personnel and Facilities
DRU	Direct Reporting Unit
ESCM	End Strength Cost Model

EUCOM	U.S. European Command
FCM	FORCES Cost Model
FCS	Future Combat Systems
FOA	Field Operating Agency
FORCES	Force and Organization Cost Estimating System
FORSCOM	U.S. Army Force Command
FYDP	Future Years Defense Program
GF	Generating Force
GWOT	Global War on Terrorism
HALE	High Altitude Long Endurance
HHC	Headquarters and Headquarters Company
HQDA	Headquarter, Department of the Army
HVT	high value target
IBCT	infantry brigade combat team
IMCOM	U.S. Army Installation Management Command
IMET	International Military Education and Training
INSCOM	U.S. Army Intelligence and Security Command
ISC	integrated security construct
ISR	intelligence, surveillance, and reconnaissance
JCIDS	Joint Capabilities Integration and Development System
JFCOM	U.S. Joint Forces Command
JIEDDO	Joint Improvised Explosive Device Defeat Organization
JSPS	Joint Strategic Planning System
MALE	medium altitude/long endurance
KIA	killed in action
MCA	Military Contraction Army
MDA	Missile Defense Agency
MDW	Military District of Washington
MEDCOM	Army Medical Command
MILCON	Military Construction
MiTT	Military Transition Team
MPA	Military Personnel, Army
MRAP	Mine Resistant Armor Protected Vehicle
MSFD	Multi-Service Force Deployment
NATO	North Atlantic Treaty Organization
NETCOM	U.S. Army Network and Enterprise and Technology Command
NGOM	National Guard Operations and Maintenance
NGPA	National Guard Personnel, Army
NORTHCOM	U.S. Northern Command

OASA (FM&C)	Office of the Assistant Secretary of Army for Financial Management and Comptroller
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
OMA	Operations and Maintenance, Army
OMAR	Operations and Maintenance, Army Reserve
OMB	Office of Management and Budget
OND	Operation New Dawn
OSD	Office of the Secretary of Defense
PACOM	U.S. Pacific Command
PAED	Program Analysis and Evaluation Directorate
PAT	Portfolio Analysis Tool
POM	program objective memorandum
PPBES	Planning, Programming, Budgeting and Evaluation System
PSYOPS	Psychological Operations
QDR	Quadrennial Defense Review
R&D	research and development
RCA	Army Reserve Military Construction
RDTE	research, development, test and evaluation
REF	Rapid Equipping Force
ROTC	Reserve Officers' Training Corps
SAG	sub-activity group
SBCT	Stryker brigade combat team
SDDC	Surface Deployment and Distribution Command
SF	Special Forces
SIAP	Strategic Investment Analysis Protocol
SLOC	sea lines of communication
SMDC	Space and Missile Defense Command
SOCOM	U.S. Special Operations Command
SOF	Special Operations Force
SOUTHCOM	U.S. Southern Command
SSSP	Steady State Security Posture
STRATCOM	U.S. Strategic Command
TAA	Total Army Analysis
TRADOC	U.S. Army Training and Doctrine Command
TRANSCOM	U.S. Transportation Command
UAV	Unmanned Aerial Vehicle
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force

USAID	U.S. Agency for International Development
USAR	U.S. Army Reserve
USARF	U.S. Army Africa
USARC	U.S. Army Reserve Command
USAREUR	U.S. Army Europe
USARNORTH	U.S. Army North
USARPAC	U.S. Army Pacific
USARSO	U.S. Army South
USASOC	U.S. Army Special Operations Command
USMA	U.S. Military Academy
WMD	Weapon of Mass Destruction
WIA	wounded in action

1. Introduction

This report describes and explains a method, the Strategic Investment Analysis Protocol (SIAP),⁵ which Army planners can use to estimate the resource implications of changes in defense strategy for the Army. It complements existing processes like the Department of Defense's (DoD's) Planning, Programming, Budgeting and Execution (PPBE) system, the Joint Capabilities Integration and Development System (JCIDS) and Total Army Analysis (TAA). The SIAP differs from the aforementioned processes in that it is more responsive and requires fewer resources to execute. It also differs in that it integrates a consistent, empirically based method for assessing generating force costs as they vary with strategy. SIAP's primary use will lie in supporting the development of resource-informed strategic guidance to initiate other processes. It can also support short-notice strategic decisions, such as the December 2006 decision to increase the size of the Army by 65,000 soldiers. Planners can use the SIAP to identify investment strategies that are "robust" in the event of significant changes in the security environment or U.S. strategy. As the eminent British military historian Michael Howard put it, the object is to avoid being "too badly wrong" for a future that is difficult to anticipate.⁶ Figure 1.1 depicts the SIAP in outline form.

Definitions

We use a number of terms in this report. Some of these terms may be unfamiliar; others may mean different things to different people. To ensure clarity, we define the most important terms here.

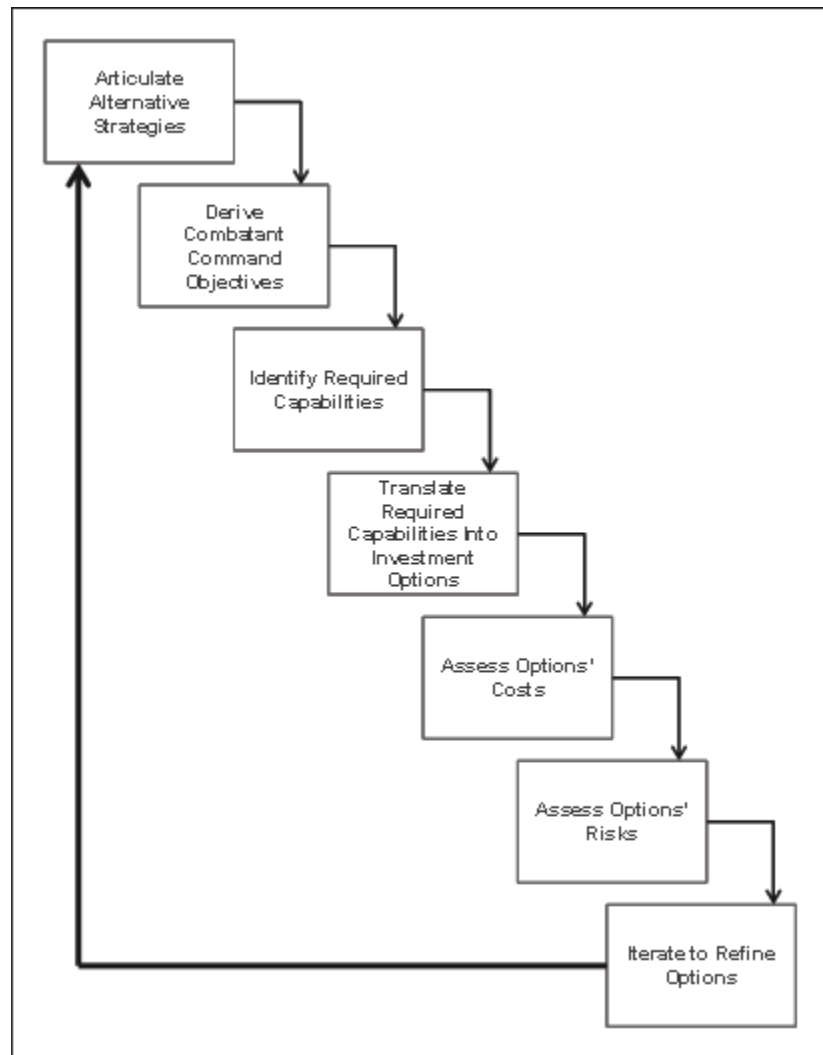
The first such term is the "defense strategy." According to JP 3-0, the *national defense strategy* is "A document approved by the Secretary of Defense for applying the Armed Forces of the United States in coordination with Department of Defense agencies and other instruments of national power to achieve national security strategy objectives." This definition is almost indistinguishable from that of the National Military Strategy (NMS). In the opinion of the authors, the defense strategy differs from the NMS in two important respects. First, it provides actual direction because it is issued on the authority of the Secretary of Defense. Second, and more importantly, it usually describes the employment of forces with greater clarity than the NMS, which tends to focus on the development and maintenance of the force.

Two other important terms are Operational Army and generating force. The Army is organized into two functionally distinct but organizationally interrelated entities to which Army

⁵ Readers should not attach too much importance to the name. As the study evolved, it became clear that the method being developed should have one, and SIAP was as good as any other.

⁶ Michael Howard, "Military Science in the Age of Peace," *RUSI Journal*, Vol. 119, March 1974, pp. 3–9.

Figure 1.1: RAND Approach for Relating Resources to Strategy: The Strategic Investment Analysis Protocol (SIAP)



doctrine refers as the *operational Army* and the *generating force*. The former consists of those Army organizations whose primary purpose is the conduct of full-spectrum operations under the direction of joint force commanders. The latter consists of those Army organizations whose primary purpose is to generate and sustain Army capabilities for employment by joint force commanders.⁷ As the descriptor “primary purpose” implies, any number of Army organizations play roles in both the operational Army and the generating force. For example, the Third U.S. Army, the Army service component command to U.S. Central Command, planned and directed

⁷ Field Manual 1-01, *Generating Force Support for Operations*, Washington, D.C.: Headquarters, Department of the Army, April 2, 2008, glossary.

the ground invasion of Iraq in March 2003. Since then, its primary role has been to support Army forces operating under commanders in Iraq and Afghanistan.

The term *investment option* denotes the package of operational activities, force structure, acquisition, and other activities that provide the capabilities required by strategy. It is broader than the term investment accounts, which usually denote procurement and research and development activities. We use this term to clearly distinguish Army responsibilities to provide forces from combatant commands' responsibilities to employ them. *Strategy*, in its most common usage, is the combination of available *means*, used in defined *ways*, to achieve the *ends* defined by policy. Army responsibilities are limited by statute to providing the means of strategy. While the Army may have strategies for providing those means—e.g., the Army modernization strategy—use of the same term for qualitatively different activities is always confusing.

An Army Need for Responsive Analysis

The Army's role in national defense is to provide landpower capabilities to combatant commanders with which the latter execute the nation's defense strategy. To fulfill this role, the Army must not only respond to current demands but also anticipate future requirements. The Army's task is complicated by the fact that defense strategy can change suddenly. Perhaps the most vivid recent example of such change was the decision to launch the "surge" during Operation Iraqi Freedom (OIF). That strategic shift emerged from a tightly held review of strategy at the White House and involved significant changes to investment strategy as well as the better-known changes in the employment of the force. Besides the aforementioned decision to "grow the Army," Secretary Gates also made the decision to acquire mine resistant, armor protected (MRAP) vehicles on a large scale. Before that, the 2001 Quadrennial Defense Review Report had not even been released before the September 11 attacks forced major changes in plans to change U.S. force structure and capabilities. Developing and fielding new materiel systems, on the other hand, requires anywhere from five to fifteen years.⁸ Major weapons systems that incorporate cutting-edge technologies take even longer. Ensuring that the capabilities developed are adequate to operational requirements at the time they are fielded requires considerable foresight.

Because new defense strategies have extensive long-term implications for the Army, the Army should be able to explain those implications while alternative strategies are under consideration. Indeed, because the expected costs of a national defense strategy may influence its content and attractiveness, the Army and other force providers owe it to the DoD to explain resource implications while alternative strategies are under consideration, rather than to discover them well after one has been adopted. If the President and Secretary of Defense ask the

⁸ Katherine V. Schinasi, *DoD Acquisition Outcomes: The Case for Change: Testimony before the Subcommittee on AirLand, Committee on Armed Services, United States Senate*, Washington, D.C.: U.S. Government Accountability Office, 2005, p. 2.

Chairman of the Joint Chiefs of Staff what a given defense strategy would cost—as they should before adopting it—the Army will need to be able to respond more or less immediately with a first-order estimate. Upon clarification of national strategy, Army leaders could communicate changes in costs promptly if preliminarily, rather than wait for bureaucratic processes to play out in ensuing years.

Beyond participation in strategic deliberations, developing, fielding, and maintaining landpower capabilities is the business of the Army. Capabilities developers must understand the range of plausible security environments, strategies for coping with those environments, and the costs to provide the capabilities to underwrite the strategy the national leadership adopts. A capability that the nation cannot afford is of no use, regardless of its putative operational effectiveness. Indeed it may be just as important to focus development efforts on reducing the cost of providing a given capability as it is to improve its operational effectiveness. Capabilities developers, however, must frequently make recommendations about investment decisions without full knowledge of the likely resource environment.

The Army must also understand the implications of a particular defense strategy for its generating force. To field a given operational capability, like a brigade combat team prepared for full-spectrum operations, requires institutional training, organizational training like the National Training Center and depot maintenance provided by the generating force. While the Army has a number of models that enable it to estimate the resources required to fund an operational Army of a given size and composition, it lacks analogous tools with which to estimate the resources the Army's generating force will require to generate and sustain that operational Army. To be sure, there are some models that address aspects of the problem, such as the training workforce's size and structure in relation to the number of soldiers to be trained or the capacity of individual installations to absorb additional soldiers. There are no models, however, that relate the demands of strategy to generating force costs in a comprehensive manner.

For this reason, the Army Capabilities Integration Center (ARCIC) sought to improve the Army's ability to forecast how changes in strategy affect costs for both the operational Army and the generating force. ARCIC wanted to improve its ability to make resource-informed recommendations on investment options. ARCIC wanted to ensure that the capabilities it recommended for development both responded to the demands of the defense strategy and fit within existing resource constraints.

Existing Processes

The Departments of Defense and Army already have several processes for relating resources to strategy. These processes fall under the general rubric of PPBE. They include but are not limited to:

- The PPBE process itself, narrowly defined

- Support for Strategic Analysis⁹
- The Joint Strategic Planning System (JSPS)
- The Joint Capabilities Integration and Development System (JCIDS)
- Total Army Analysis (TAA).

This section summarizes how these processes work together to determine the resources required to develop and maintain capabilities to implement the defense strategy at an acceptable level of risk, focusing on their application in the Army’s particular context. It does not do full justice to these processes’ sophistication, but it should provide a basis for comparison with the method described in this report.

The process follows the steps outlined in Figure 1.2 and starts with strategy. The National Defense Strategy synthesizes formal and informal policy guidance such as the National Security Strategy into broad guidance for the employment and development of defense capabilities. The Defense Planning and Programming Guidance (DPPG) then translates the Defense Strategy into specific objectives for combatant commands to achieve in their areas of responsibility. It also provides guidance to DoD components about the forces and programs necessary to support combatant commands’ operations in the near- and longer-term.

Extensive, elaborate analytical processes support the development of this guidance by identifying the capabilities and capacity needed to execute ongoing missions and possible contingency operations. At the DoD level, the two most important such processes are JSPS and Support for Strategic Analysis. In the former, combatant command staffs conduct detailed planning as to how they will achieve near-term ongoing missions, such as Operation Enduring Freedom (OEF) and theater security cooperation, and for specified contingency operations. Other DoD components develop detailed plans for how they will support combatant commands’ operations. JSPS is oriented on the near term.¹⁰ In Support to Strategic Analysis, service and other DoD component staffs collaboratively identify the capability and capacity required to achieve U.S. objectives in a range of Defense Planning Scenarios (DPSs) that notionally occur in the period just beyond the end of the Future Years Defense Program (FYDP). Support for Strategic Analysis focuses on the longer term and exists to provide an analytical basis for planning the capabilities and capacity required to attain U.S. objectives in a future security environment.¹¹ For the Army, this analysis usually results in a “directed force” of combat brigades and division headquarters that the Office of the Secretary of Defense (OSD) directs the

⁹ We will not use an acronym to refer to Support for Strategic Analysis, since “SSA” is also the acronym for the Social Security Administration.

¹⁰ Chairman of the Joint Chiefs of Staff, CJCS Instruction, (CJCSI) 3100.01B, *Joint Strategic Planning System*, December 12, 2008.

¹¹ Department of Defense Directive (DoDD), 8260.05, *Support for Strategic Analysis*, July 7, 2011; Department of Defense Instruction (DoDI) 8260.2, *Implementation of Data Collection, Development and Management for Strategic Analyses*, January 21, 2003.

Army to maintain. Both JSPS and Support for Strategic Analysis produce fairly detailed lists of the operating forces required to execute specific missions both now and in the future.

Figure 1.2: Department of Defense Process for Translating Strategy into Resources



The Army further refines the results of Support for Strategic Analysis in particular in its TAA process. Total Army Analysis generally takes the “directed force” emerging from Support for Strategic Analysis and conducts detailed modeling and simulation analysis to ascertain the support and sustainment forces needed to complement that force. TAA consists of a “Requirements Phase” and a “Resourcing Phase.” In the former, the Center for Army Analysis uses approved models to determine the forces required to execute a prescribed range of scenarios at a minimal level of risk. In the latter, decisionmakers and stakeholders rely on their best military judgment to determine how much of that force they can afford to develop and sustain. Since 2005, the Army has included the generating force into TAA. As of this writing, however, the generating force TAA relies upon negotiation among stakeholders to identify generating force manpower requirements, according to stakeholders and managers of this particular process. There is nothing inherently invalid about such an approach, but it is by definition time-consuming and manpower intensive. TAA’s end result is the Army Structure Memorandum

(ARSTRUC) that describes the forces that will comprise the Army over the course of the Future Years Defense Program.¹²

Army programmers integrate the results of these analyses with DoD and Army guidance to produce an Army budget and program objective memorandum (POM). Human resources specialists estimate the personnel lifecycle costs associated with the resulting structure, while acquisition analysts project the costs associated with procurement. Training analysts in the Army G-3 use the Training Resources Model (TRM) to assess the operations and maintenance costs to train that force. The Army submits the result, the Army POM to OSD for review. OSD reviews the proposals and then issues guidance to the services on what they may actually spend.

As implied by the foregoing description, these processes are elaborate and time-consuming and require considerable resources to execute. Officially, the PPBE process is supposed to last a little longer than thirteen months from inception until the Office of Management and Budget (OMB) submits the President's Budget to Congress.¹³ That timeline does not include the time required for Support for Strategic Analysis or the related TAA process. Support to Strategic Analysis is continuous and ongoing, while TAA takes several months from initiation in the spring until issuance of the ARSTRUC. In theory, the Army G-3 issues the ARSTRUC in October, just before OSD is supposed to initiate the POM process. That timeline is honored more in the breach than in the observance. Moreover, literally hundreds of analysts, if not thousands, are involved in each of these processes on at least a part-time basis. Finally, none of these processes includes an analytically grounded means of assessing generating force costs.

In short, these processes simply cannot produce a preliminary, rough-order-of-magnitude estimate of a potential strategy's costs. Each separate process takes too long, takes too many people, and depends too much on outputs from other, similar processes. Moreover, because of the number of stakeholders, they are ill-suited for exploratory analysis in which important stakeholders' equities and imperatives might be questioned. These processes are well-suited to developing comprehensive, precise estimates of a particular strategy's costs in a particular security environment. They are not well-suited to exploratory analysis of different strategies' relative costs, which should inform the selection of a particular strategy. Nor are they particularly useful in the case of a major strategic discontinuity, like that precipitated by the terror attacks of September 11, 2001, or the one associated with the 2007 surge in Iraq.

¹² For the most recent process description, see U.S. Army Force Management School, *Total Army Analysis Primer*, undated, and "TAA Short Primer," November 3, 2010. The latter can be found online. As of February, 26, 2013: http://www.afms1.belvoir.army.mil/files/primers/TAA_short%20primer_3_Nov_2010.pdf

¹³ DoDI 7045.14, *Implementation of the Planning, Programming and Budgeting System (PPBS)*, as of April 9, 1987, p. 22.

Combatant Commands As Units of Analysis

Combatant commands (COCOMs) are fundamental to the execution of defense strategy. They are of analysts fundamental to existing DoD processes relating strategy to resources and to this method as well. Combatant Commands are responsible for results—enemies deterred or defeated, instability reduced, U.S. interests advanced and protected—whereas force providers are responsible for inputs and most of the costs. Consequently, the Army must interpret and respond to the COCOMs’ “demand” for the capabilities needed to achieve their objectives under the nation’s defense strategy. From another perspective, the Secretary of Defense evaluates COCOMs’ performance based on how well they achieve U.S. strategic objective, and their services on the degree to which they provide the forces that COCOMs require. Importantly, each regional COCOM has an Army component command attached to it that is responsible for providing that combatant command with capable forces for land combat that respond to the needs of the combatant command as it implements the national defense strategy.

Research Method

This study applies previous RAND work on deriving costs from strategy in a joint context to the Army, and by extension other services and force providers. The research team illustrates that method by applying it to three notional strategies, described briefly below:

- *Direct Counterinsurgency (COIN)*: In effect, the *de facto* national defense strategy through 2008, reflecting the view that violent extremism is the gravest threat to vital regions and to U.S. security and the judgment that U.S. forces must be able to mount large and lengthy occupations and campaigns, e.g., those in Iraq and Afghanistan.
- *Build Local Defend Global*: An alternative to the current strategy based on an assessment that the best way of countering the threat of violent extremism is through U.S. development and support of effective and reliable indigenous forces in countries and regions of concern.
- *Counter a Rising Peer*: An alternative based on the view that the most profound national security challenge (though not necessarily the most urgent one) is the expansion, modernization, and projection of peer and near-peer military capabilities and that rising peers will increasingly view U.S. military power as an obstacle to their national, regional, and global goals. For the sake of this analysis, we assume that China is the primary example of a near-peer competitor.

We have fleshed out these strategic concepts as necessary to illustrate the analytic method we propose; they are not fully developed, even as concepts. This analysis is for illustrative purposes only and either omits or neglects several analyses that would be important in rigorously assessing these alternatives.

To apply that method, the research team had to expand its earlier work in three principal ways:

- Extending the previous analysis, which focused on operating forces, to include support and sustainment forces, e.g., engineer brigades and air defense artillery battalions.
- Developing a method for relating generating force costs to strategy.
- Assessing the degree to which investment options are robust across plausible alternative security environments.

The research team was able to incorporate support and sustainment forces in its analysis by relying on Army rules of allocation. *Rules of allocation* are doctrinally established heuristics for determining how many of one kind of unit, e.g., transportation battalions, are required to support another kind of unit, e.g., brigade combat teams, under certain conditions. Rules of allocation can be either existence-based or workload-based. If the former, the mere existence of one kind of unit implies the need for other kinds. For example, one division headquarters commonly commands between three to five brigade combat teams. If the latter, anticipation of a certain amount of a certain type of work implies a need for a unit. For example, if a given scenario includes supply routes of a certain distance, some number of military police (MP) companies will be required to secure those routes. For the purposes of this study, we relied on existence rules.

To relate generating force costs to strategy, the research team applied qualitative and quantitative analysis to Army budget justification documents from 1995 forward. In this endeavor, we exploited the close alignment between generating force core processes as defined in Department of the Army Pamphlet 100-1, *Force XXI Institutional Army Redesign* (1998) and the structure of the Army budget. First, we studied the patterns in Army resource allocation over the past decade and a half, noting significant increases or reductions in spending.¹⁴ Next, we sought to identify the reasons for such increases or reductions in the budget justifications themselves. We operationalized these variables into tangible proxy factors—e.g., the number of brigade combat teams (BCTs) committed to operations—and attempted to correlate those proxies with variation in budget execution by sub-activity group (SAG). We aggregated those variables into seven major categories. Changes to variables within these seven categories lead to variation in generating force costs. The primary virtue of the resulting analysis is that it can accurately reflect the magnitude and vector of change with regard to a specific SAG.

Finally, the research team explained a means for assessing the robustness of strategies across alternative security environments. Often, different strategies and investment options originate in different perceptions of the probable security environment. Moreover, proponents' assessments of alternative strategies' cost and efficacy are often predicated on rosy assumptions about the security environment, at least in terms of its response to the proponents' preferred strategy. This study illustrates how to use RAND's Portfolio Analysis Tool (PAT) to assess how well investment options fare under different sets of assumption about the future. This approach

¹⁴ Obviously, this timeframe includes only a limited range of strategic circumstances. We recommend that future analysts expand the timeframe under consideration in order to refine generating force cost models.

mirrors the one employed for the 2010 Quadrennial Defense Review and is consistent with studies by RAND and others advocating the use of multiple scenarios in identifying and refining investment options.¹⁵

Structure of the Report

Using these definitions, ideas, and methods, this study proceeds as follows:

Chapter 2 recapitulates the method and articulates the notional alternative strategies used to illustrate it in this study.

Chapter 3 explains and demonstrates the methods used to estimate operational Army and costs.

Chapter 4 explains and demonstrates the methods used to estimate generating force costs.

Chapter 5 covers the subject of assessing alternatives' abilities to meet the demands of alternative future security environments using RAND's Portfolio Analysis Tool.

Chapter 6 provides findings and conclusions.

¹⁵ Robert M. Gates, *2010 Quadrennial Defense Review Report*, Washington, D.C.: Department of Defense, 2010, p. 40–42, referred to hereafter as 2010 QDR; Richard Danzig, *Driving in the Dark: Ten Propositions About Prediction and National Security*, Washington, D.C.: Center for a New American Security, 2011; Robert L. Lempert, Steven W. Popper, and Steven C. Bankes, *Shaping the Next One Hundred Years: New Methods for Quantitative, Long-Term Policy Analysis*, Santa Monica, Calif.: RAND Corporation, MR-1626-RPC, 2003. The method we propose in this report is significantly less sophisticated than that described by Lempert et al. but is perhaps more accessible to policymakers.

2. Developing Alternative Strategies to Support Analysis

This research report describes an approach to estimating how Army costs might change in response to changes in defense strategy—the Strategic Investment Analysis Protocol (SIAP). Unfortunately, defense strategies will be least developed at the point when understanding their resource implications would be most useful. The point at which such understanding is most important, however, is the period during which officials are considering alternative strategic concepts. Only after selecting a strategic concept will they proceed to defining the more concrete measures that will implement it, from which analysts can derive costs. To develop cost estimates that could inform the selection of a strategic concept, analysts must therefore infer those concrete measures or some plausible proxy for them.

This chapter demonstrates an approach to doing so. It briefly describes each step in SIAP. We pay particular attention to the distinction between the operational Army and the generating force, which is fundamental to our approach to analyzing strategies' cost implications for the Army. It concludes with short descriptions of the illustrative strategies to which we refer throughout this report, along with their major implications for Army forces and programs. The chapter's purpose is to establish a context for our more detailed explanations of our approaches to assessing operational Army and generating force costs in Chapters Three and Four respectively.

The Strategic Investment Analysis Protocol in Brief

In this section, we briefly explain each step in the method, as depicted in Figure 2.1. Appendix A repeats this description and provides illustrative examples of each step.

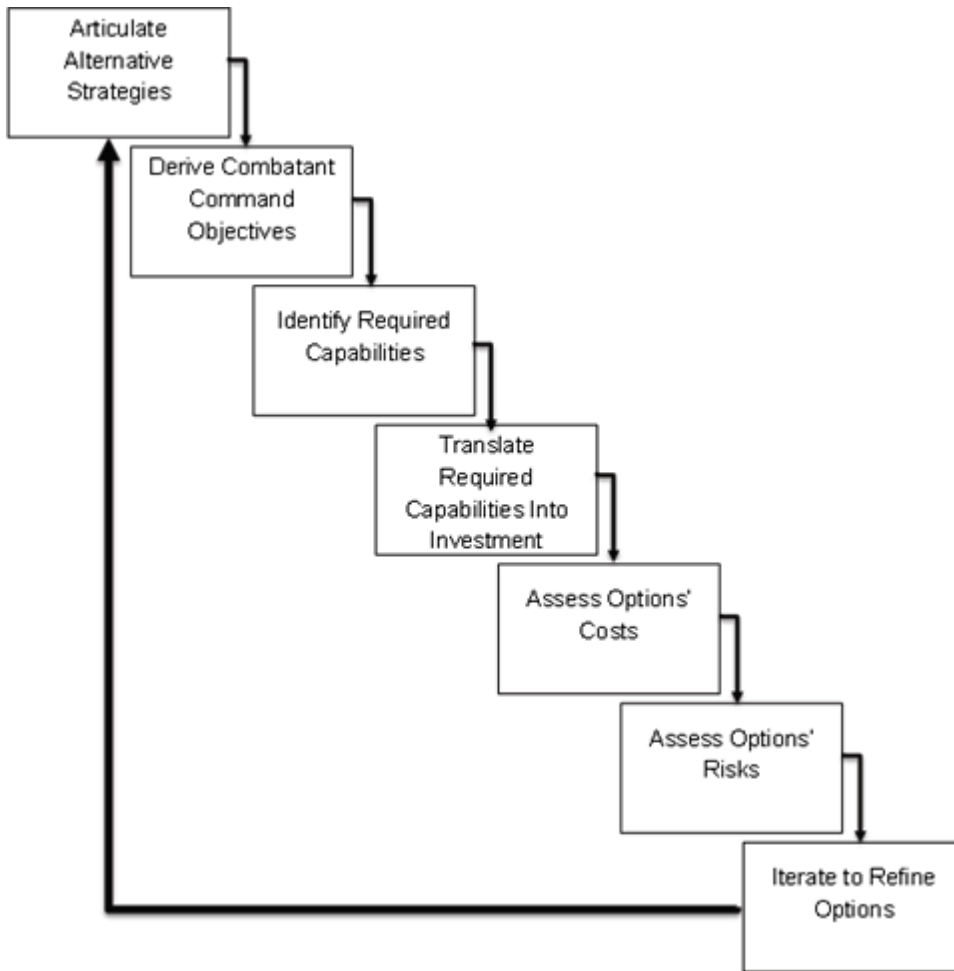
Articulate Alternative Strategies

The resource implications of a change in strategy begin with a clear statement of the strategy. The concept expressed in this statement rests on certain assumptions about the nature of the future security environment and its dynamics. Thus, a short statement describing these guiding assumptions precedes the strategy statement.

- What conditions are emerging that pose challenges to our national security?
- Why are they important and why do they need to be addressed as a priority by our national security strategy?

The **strategy statement** indicates how these challenges will be addressed. It is focused enough to provide force planners with a clear vector for making force structure and programmatic choices but broad enough to include the spectrum of enduring U.S. national security imperatives.

Figure 2.1: The Strategic Investment Analysis Protocol



Next, the **goals** of the strategy are articulated in output terms. What end state does the United States seek in choosing and embarking on a particular strategy? The final task in developing a strategy is to examine the goals and develop the best **approach** for achieving them.

Derive Combatant Command Objectives

Once DoD has developed and articulated its strategy, it would look to the combatant commands. This phase in the analysis demands that objectives be set for each COCOM that, if achieved, would lead to successful implementation of the strategy. This step, of necessity, precedes the determination of capabilities and therefore what resources (military forces and security assistance funding for the most part) are to be provided in response to demands generated by the combatant commands.

Identify Required Capabilities

With the objectives of each combatant command established, DoD force planners would then determine what capabilities are implied that differ from those called for in the current strategy as reflected in the current force structure and FYDP. The objectives are analyzed COCOM by COCOM, and the needed capability is stated clearly in output terms. For some strategies, certain combatant commands will need an increase in capabilities while others might need fewer than provided for in the current program.

Translate Required Capabilities into Investment Options

With an assessment of the capabilities needed by the several combatant commands complete, force planners can identify the programs and force shifts that they assess will deliver those capabilities effectively and cost-effectively. Some combatant commands will require programs beyond those in the current program to provide the extra capabilities implied; some, under certain strategies, could require less, and the programs would be backed out of the force structure/FYDP. Capabilities can also be added or subtracted by shifting forces from one combatant command to another as the demand signals change with a change in strategy. The methodology makes explicit this addition, subtraction, and/or redistribution of forces and other programs among the combatant commands.

At this point, Army analysts would examine the demand signals from the combatant commands that call for Army capabilities and make a judgment on what Army programs would best deliver them. This could well take the form of an iterative process wherein, along with the Joint Staff, the Army refines the specific capabilities needed and reaches into its analytic community to decide how best to fulfill the capabilities requirement. This does not demand new skills or a new organization. The Army does this on a regular basis in the Joint Strategic Planning System.

We should note that such programs and force shifts can affect the entire joint force. Different strategies might imply a shift in reliance from one domain or service to another. The recent discussion of “Air-Sea Battle” provides one such example. Our earlier work emphasized the joint dimension. Likewise, different strategies might emphasize greater or lesser reliance on the reserve components, based on the immediacy and extent of perceived threats.

Assess Options' Costs

Finally, Army analysts do life-cycle costing¹⁶ COCOM by COCOM for those programs that are added or dropped from the current program. Those analysts then estimate costs for the operational Army and the generating force. We describe those methods in Chapters 3 and 4, respectively. The results are therefore transparent and provide an audit trail that indicates

- increases, decreases, or shifts of Army resources among the combatant commands
- challenges in meeting the costs (e.g., gathering “bow waves” in budget demands).

At its conclusion, the methodology yields an estimate for the costs to implement a particular strategy over a period of time. For this study, we used a 20-year period in order to capture the full costs implied by each strategy. Decisionmakers may wish to consider shorter periods, such as the duration of the FYDP. SIAP can support analysis of these shorter periods. Analysts and decisionmakers will have to make additional assumptions about events and conditions that may or may not obtain during those shorter periods, however.

Assess Options' Risks

We may assume that each option has been optimized to meet the assumed demands of a particular strategic environment. It is by no means safe to presume that the future will unfold according to those assumptions. For that reason, analysts will want to assess how well investment options hold up if some of these key assumptions become invalid. The most convenient way to do so is to assess options' ability to meet the demands of futures postulated by other alternative strategies.

Iterate

The initial comparison of options will reveal strengths and weaknesses in the competing alternatives. At that point, analysts and decisionmakers should modify the options to improve their robustness. They may eliminate some options entirely or generate new ones. After making adjustments to the competing options, analysts should repeat their assessments of relative costs and risks.

The Army Budget: An Integrating Framework

In assessing Army costs, it is convenient to assess costs for the operational Army and generating force separately. In very rough terms, the *operational Army* is the Army's

¹⁶ The cost estimates discussed later in this paper do not include disposal costs.

inventory of ready capabilities, while the generating force is the plant that produces and sustains those capabilities. The operational Army consists of the brigade, battalions, and so forth that combatant commanders use to achieve U.S. military objectives in conjunction with other Service and national capabilities. Operational Army costs consist of those resources required to maintain, sustain and replace as necessary the soldiers and equipment assigned to those units. Tools exist that allow the analyst to assess such costs for doctrinally defined unit structures. The main operational Army costs are military personnel, operations and maintenance, and procurement. The generating force consists of those organizations that organize, train, equip and sustain the operational Army for employment by joint force commanders. Generating force costs include all other resources required to support the operational Army, the joint force and the Department of Defense.

The Army budget's structure provides the integrating framework. That structure consists of five major appropriations: military personnel; operations and maintenance; research, development, test and evaluation (RDTE); procurement; and military construction. In turn, each appropriation consists of a number of budget activity groups and sub-activity groups as indicated in Table 2.1. Each SAG aligns with either the operational Army or the generating force, as indicated in Table 2.1, and requires a different approach for estimating associated costs. Operational Army SAGs are shaded in green to clearly distinguish them from generating force SAGs.

In terms of sheer quantity, most OMA SAGs align with the generating force. In terms of the resources actually allocated, however, generating force SAGs account for about half. Readers should remember that all those resources ultimately are used to support the operational Army, joint forces, or DoD. We have highlighted the appropriations and SAGs aligned with the operational Army. This alignment invites an invidious categorization of the Army into "tooth" (the operational Army) and "tail" (the generating force). Such a view is highly pernicious and wrong. In fact, operational Army capabilities' effectiveness depends both directly and indirectly on the generating force. Recruiting and training are the most obvious examples of such dependencies, but the connections are complex and deep. As we will demonstrate in Chapter 3, historical resource expenditures in each generating force SAG correspond more or less directly to the needs of the operational Army, other Department of Defense components, or to ongoing operations. There is almost certainly "fat" within the Army's structure, but it cannot be inferred from the overall size of either of the Army's functionally discrete but organizationally integrated components, the operational Army and the generating force.

Table 2.1: Alignment of the Army Budget Structure with the Operational Army and Generating Force

Appropriation/ SAG Number	SAG Title	Alignment
Military Personnel, Army (MPA)^a		Mixed
Operations and Maintenance, Army (OMA)^b		See below
111	Maneuver Units	Operational Army
112	Modular Support Brigades	Operational Army
113	Echelons Above Brigade	Operational Army
114	Theater Level Assets	Operational Army
115	Land Forces Operations Support	Generating Force
116	Aviation Assets	Operational Army
121	Force Readiness Operations Support	Generating Force
122	Land Forces Systems Readiness	Generating Force
123	Land Forces Depot Maintenance	Generating Force
131	Base Operations Support	Generating Force
132	Sustainment, Restorations and Modernization	Generating Force
133	Management and Operational Headquarters	Generating Force
134	Combatant Commands Core Operations	Generating Force
135	Additional Activities	Operational Army/Extraordinary costs of operations
138	Combatant Command Direct Mission Support	Joint
211	Strategic Mobility	Generating Force
212	Army Prepositioned Stocks	Generating Force
213	Industrial Preparedness	Generating Force
311	Officer Acquisition	Generating Force
312	Recruit Training	Generating Force
313	One Station Unit Training	Generating Force
314	Senior Reserve Officer Training Corps (SROTC)	Generating Force
321	Specialized Skill Training	Generating Force
322	Flight Training	Generating Force
332	Professional Development Education	Generating Force
333	Off-Duty and Voluntary Education	Generating Force
334	Civilian Education and Training	Generating Force
335	Junior Reserve Officer Training Corps	Generating Force
411	Security Programs	Generating Force
421	Servicewide Transportation	Generating Force
422	Central Supply Activities	Generating Force
423	Logistic Support Activities	Generating Force
424	Ammunition Management	Generating Force
431	Administration	Generating Force
432	Servicewide Communications	Generating Force
433	Manpower Management	Generating Force
434	Other Personnel Support	Generating Force
435	Other Service Support	Generating Force
436	Army Claims	Generating Force
437	Other Construction Support and Real Estate Management	Generating Force
438	Financial Improvement and Audit Readiness	Generating Force
441	International Military Headquarters	Generating Force
442	Miscellaneous Support of Other Nations	Generating Force
Research, Development, Test and Evaluation (RDTE)		Generating Force
Procurement		Operational Army
Military Construction, Army (MCA)		Generating Force
Military Construction, Army National Guard (MCNG)		
Military Construction, Army Reserve (MCAR)		

Source: RAND analysis.

^aNational Guard Personnel, Army (NGPA) and Reserve Personnel, Army (RPA) have the same structure.

^bOperations and Maintenance, Army National Guard (OMNG), and Operations and Maintenance, Army Reserve (OMAR) have the same budget structure.

Illustrative Strategies

Throughout this report, we will refer to three illustrative strategies that have different implications for Army forces and programs. In this chapter, we briefly characterize each strategy and describe its major implications for Army costs. Discussion of the strategies is deliberately abbreviated, since the focus of this report is on the methodology to determine the resource implications of different strategies, not developing the strategies themselves in detail. Those interested in a more detailed explanation of the process by which analysts can derive resource implications from statements of strategy should review our earlier work, *Analysis of Strategy and Strategies of Analysis* (Gompert et al., 2008). Appendix A presents a more detailed explication of that process.

Although the strategies are notional, they resemble strategies either in force (in the case of the Direct COIN strategy) or being considered in the broader U.S. discourse over strategy. The three illustrative strategies are

- Direct Counterinsurgency (COIN) (analytic baseline)
- Build Local Defend Global
- Rising Peer.

Direct COIN (Analytic Baseline)

Extremist Islamist insurgency is a worrisome phenomenon that threatens the homeland and important U.S. interests in such sensitive regions as the following:

- energy-producing countries in the Gulf and North Africa
- countries straddling key lines of communication, such as Indonesia
- important Muslim-majority allies and partners, such as Pakistan and Turkey
- allied NATO countries that have alienated Muslim minorities, such as the UK and France.

Islamist insurgencies can also threaten the state of Israel, to which the United States has long-standing security responsibilities.

This is a relatively new phenomenon, at least in its intensity and in its transnational character. While the United States and its allies have well-honed approaches to dealing with symmetric competitors, they are still feeling their way on how to cope with this largely new challenge. In turning to this strategy, decisionmakers have judged that it is unlikely that local states will be able to deal with the challenges by themselves. As a result, *the United States should plan on continuing, direct intervention to assist in counterinsurgency operations.*

To conduct those operations, the United States will have to maintain large, capable land forces capable of sustaining protracted, large-scale counterinsurgency operations.

The Army described in the 2010 Quadrennial Defense Review (QDR) and the fiscal year (FY) 2011 President’s Budget is a reasonable proxy for such a force. Continuous combat operations and insurgent adaptations will require the Army to adapt and replenish combat equipment at a fairly high rate. The generating force must be able to sustain such operations with a continuous, high-volume flow of units, people, equipment, and supplies optimized for the operational environments to which Army forces are committed.

Build Local Defend Global

Although the concerns of the Direct COIN strategy are valid, eliminating insurgent threats through large-scale U.S. military operations has proven to require a very large investment in U.S. forces and to be extremely expensive with no assurance of ultimate success. Indeed, the presence of U.S. military forces conducting operations on the territory of other states risks creating strong backlash reactions as adversaries depict such operations as unwanted “occupation” of their lands and of a U.S.-led “war against Islam.” Hence, for a variety of reasons, *local instability is best dealt with by local forces, which implies a strategy of investing heavily to build and sustain local capacities.*¹⁷

The Build Local Defend Global strategy implies a need to develop partners’ security forces on a large scale. That scale probably exceeds the plausible capacity of special operations forces. For that reason, the Army will probably need to develop a robust advisory capability within its general-purpose force. We therefore postulate that the Army will create an “advisory corps” to answer the needs of this strategy.

Even though this strategy is intended to preclude the necessity of committing U.S. forces directly to large-scale combat operations, it would be imprudent to rely solely on partners’ for the protection of vital U.S. interests. Therefore the operational Army under this strategy retains a substantial capability for intervention, in order to reduce threats to a level at which indigenous partners can contain them. The generating force under this strategy has a dual function: preparing U.S. forces to assist a diverse range of partners, and helping to develop those partners directly through efforts like the International Military Education and Training (IMET) program.

¹⁷ See two RAND reports for further development of the imperative for the United States to serve as an enabler of COIN operations in foreign countries, rather than be the principal actor: Andrew R. Hoehn, Adam Grissom, David Ochmanek, David A. Shlapak, and Alan J. Vick, *A New Division of Labor: Meeting America’s Security Challenges Beyond Iraq*, Santa Monica, Calif.: RAND Corporation, MG-499-AF, 2007; and David C. Gompert, John Gordon, IV, Adam Grissom, David R. Frelinger, Seth G. Jones, Martin C. Libicki, Edward O’Connell, Brooke Stearns Lawson, and Robert E. Hunter, *War by Other Means – Building Complete and Balanced Capabilities for Counterinsurgency*, Santa Monica, Calif.: RAND Corporation, MG-595/2-OSD, 2008.

Rising Peer

Although the Islamist challenge is undeniable as mentioned in the current Direct COIN and Build Local Defend Global strategies, the preeminent challenge is the rise of potential adversaries like China. Chinese diplomatic, economic, technological, and military power cannot help but alter the strategic landscape. Unless the U.S. takes proactive measures, this expansion could take place at the expense of U.S. interests. A strong U.S. stance, in the Pacific and globally, will lay the foundation for a stable, peaceful, long-term relationship with China (albeit one of competition). The Islamist challenge, although substantial, can probably be contained by supporting the efforts of local countries, and without greater investments than are already part of the current program. We should note that China serves as a proxy for any other large, technologically and economically advanced adversary. For these reasons, *the United States should prepare to emphasize technology and materiel modernization to cope with an emerging peer competitor.*

The Rising Peer strategy supposes that the likelihood of direct confrontation with an emerging peer is low and aims to keep it that way by maintaining overmatch with regard to military capabilities. Air defense and other antiaccess capabilities are particularly important under this strategy. The Army must be able to deploy such capabilities rapidly to countries threatened with invasion or coercion in order to deter or defeat aggression. The generating force bears the responsibility to ensure capabilities overmatch, and to enable rapid power projection from Army bases worldwide.

Summary and Conclusions

This chapter provides the necessary background for estimating operational Army and generating force costs. It recapitulates the overall approach to deriving costs from changes in defense strategy, summarizes earlier work elaborating alternative defense strategies, and aligns elements of the Army budget with either the operational Army or the generating force. In combination with the Appendixes, it indicates the level of detail needed to support preliminary projections of costs. Appendix A illustrates the application of SIAP to derive the required capabilities of the COCOMs. Appendix B illustrates how to translate those required capabilities into Army force structures. The focus of this report, however, is on assessing the costs of various options. The next two chapters explain how use the results of the analytic process illustrated by Appendixes A and B to estimate costs for the operational Army and the generating Army, respectively. In short, SIAP's Step 5, "Assess Options' Costs," is divided between two chapters.

3. Estimating Operational Army Costs

In this chapter, we explain the process by which we estimated investment options' operational Army costs, including their force structures' operations and support costs and the procurement costs incurred under alternative investment options. We derive the costs from the Army force structures and activities implied by each illustrative strategy. Finally, we explain how we estimate costs to employ the operational Army in major contingency operations, to the degree that those operations are implied by a particular defense strategy. In short, this chapter elucidates how to estimate the costs of maintaining and employing the operational Army implied by a particular defense strategy. The focus is on the method; notional cost estimates for illustrative strategies are presented at the end of the chapter solely for the purpose of allowing readers to assess the method's validity.

Estimating Operational Army Costs

Operational Army costs break down into three broad categories: ordinary operations and support costs, procurement costs, and the extraordinary costs of operations. This section explains how we developed those estimates. In this study, we relied on data provided by the Cost and Economics Division of the Office of the Assistant Secretary of the Army for Financial Management and Comptroller (OASA (FM&C)) for our estimates of unit operations and support costs and procurement costs. To estimate the extraordinary cost of operations, the research team relied on analogs from the last decade of conflict.

In the next several sections, we will explain the methods used to estimate various kinds of costs, accompanied by the results. We will present the results as charts, to avoid creating a false impression of precision. Given uncertainty about the future, such precision would be unwarranted. As we have stated repeatedly, these estimates are best used to understand to provide a rough order of magnitude assessment of options' relative cost.

Estimating Operations and Support Costs

Operations and support costs are all those costs necessary to maintain a particular defense capability. Those costs include personnel, spare parts and fuel, maintenance, contract support, other sustainment and indirect support, such as base operations. According to DoD 5000.4-M, *DOD Cost Analysis Guidance and Procedures*, operations

and support costs can be funded from any appropriation.¹⁸ OASA (FM&C) uses its FORCES Cost Model (FCM) to develop such estimates.¹⁹

The FORCES Cost Model estimates costs for Army unit types. The resulting estimates are broken down into five major cost elements:

- **Direct equipment, parts and fuel** funds spare parts, ammunition, and fuel costs that units incur during training.
- **Indirect support** funds other operations and maintenance costs that units incur by virtue of their very existence, such as organizational clothing and equipment or office supplies.
- **Post production software support** includes expenses related to maintaining and upgrading software in Army tactical systems, such as fire control systems or mission command.
- **Military personnel** covers not only pay and benefits but also all training through initial military occupational specialty (MOS). For this part of the study we included only those costs that were funded from military personnel appropriations.
- **Other unit support**, as noted, covers other operations and support costs not included above. Base operations are a major part of this cost element.

In this part of the study, we focused on direct equipment, parts, and fuel costs,²⁰ indirect support costs; and personnel costs. Adding estimates of direct equipment, parts, and fuel and indirect support costs categories together for every unit in the Army provides an estimated requirement for the operations and maintenance sub-activity groups indicated in Table 3.1. These SAGs fund all Army unit-level operations and related expenses. Aggregating costs in this fashion allows analysts to cross-walk their estimates to the Army budget. SAG 115, Land Forces Operations Support, is omitted because it funds combat training center activities, a generating force function.

OASA (FM&C) provided us with brigade-level estimates. That required them to develop composite estimates for multifunctional support brigades and functional brigades. Under the modular force concept, brigade combat teams and combat aviation brigades are organized as relatively fixed formations including all required capabilities, e.g., maneuver battalions, reconnaissance squadrons, fires battalions, and so forth. Multifunctional support brigades and functional brigades, on the other hand, are actually just brigade headquarters, usually with an attached support company or support battalion.

¹⁸ Assistant Secretary of Defense, Program Analysis and Evaluation, DoD 5000.4-M, *DOD Cost Analysis Guidance and Procedures*, 1992, p. 49.

¹⁹ FORCES stands for Force and Organization Cost Estimating System.

²⁰ Less ammunition, a procurement cost.

Table 3.1: Operating Forces Sub-Activity Groups and Representative Unit Types

SAG	SAG Title	Representative Units
111	Maneuver Units	<ul style="list-style-type: none"> • Brigade combat teams • Division headquarters
112	Modular Support Brigades	<ul style="list-style-type: none"> • Fires brigades • Battlefield surveillance brigades • Maneuver enhancement brigades • Sustainment brigades
113	Echelons Above Brigade	<ul style="list-style-type: none"> • Chemical, engineer, medical, signal, financial management, personnel, military police, military intelligence, air defense artillery, and logistics units. Note that these units are usually individual brigades or even companies.
114	Theater-Level Assets	<ul style="list-style-type: none"> • ASCC deployable command posts • Functional brigades, e.g., engineer, medical, military police • Air defense units
116	Aviation Assets	<ul style="list-style-type: none"> • Combat aviation brigades • Theater aviation brigades

Source: OASA (FM&C), *Department of the Army FY 2013 Budget Estimate: Operations and Maintenance, Army, Justification Book*, v. 1, February 2012.

Other units are attached as appropriate to the mission. For example, a maneuver enhancement brigade (MEB) consists of a headquarters company, a brigade support battalion and a network support company. Engineer, chemical, military police and other maneuver support units may be attached, depending on the mission.²¹

We used the estimates that OASA (FM&C) provided to estimate operations and support costs for the force structures whose major component are indicated in Table 3.2. More-detailed descriptions of these force structures, as well as the chain of logic by which they were developed, is contained in Appendix B of this report.²²

There would be a period of transition between the baseline option, the Direct COIN force structure, and any alternative. We assume that this transition would occur over the duration of the Future Years Defense Program. The other strategies would have the same start point but different end points. The start point for each of the strategies is the analytic baseline, the Direct COIN force structure’s costs. Thus, to arrive at our estimate of expenses over that period, we simply averaged the annual costs of the Direct COIN force structure and each alternative and multiplied those estimates by the five years of the FYDP. For example, the cost of the Build Local Defend Global force structure over the FYDP would be the average of Direct COIN force’s annual costs—the start point—and those of the Build Local Defend Global force—the end point. We would then multiply

²¹ Headquarters, Department of the Army, FM 3-90.31, *Maneuver Enhancement Brigade Operations*, February 2009, pp. 2-2 and 2-3.

²² We wish to emphasize that we developed these alternative force structures to be good enough to illustrate our costing processes and plausibly derived from our three illustrative strategies. The study team does not otherwise endorse them.

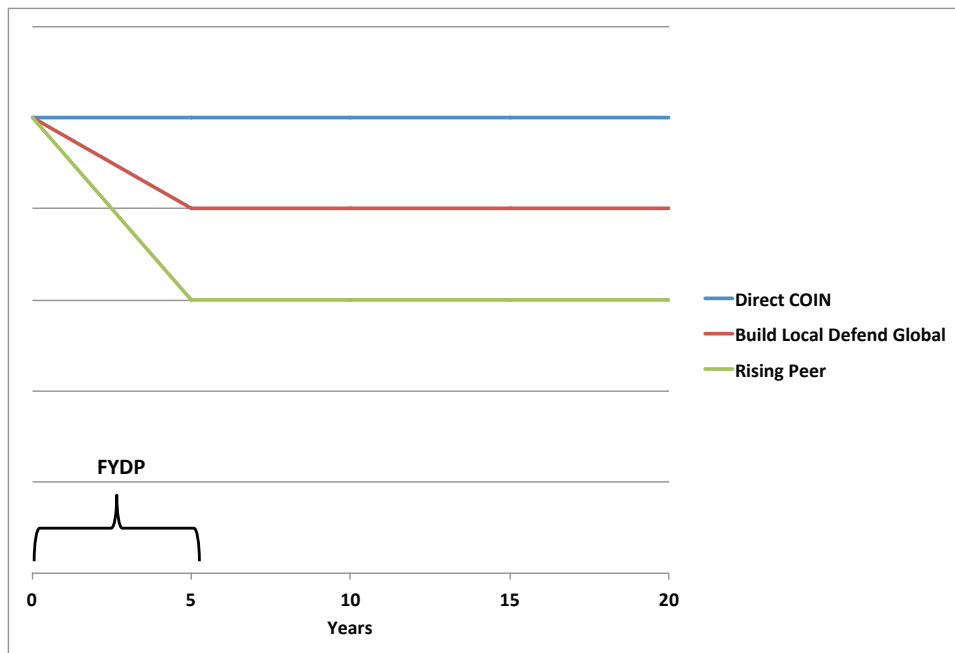
the annual costs of each option by the fifteen years remaining in the period under consideration. Figure 3.1 below depicts this approach graphically.

Table 3.2: Major Elements of Force Structure Under Illustrative Strategies

	Direct COIN		Build Local Defend Global		Rising Peer	
	AC	RC	AC	RC	AC	RC
Divisions	10	8	8	7	9	7
Advisory corps	0	0	1	0	0	0
ABCTs	18	7	10	4	18	7
IBCTs	23	20	23	20	17	18
SBCTs	7	1	7	1	7	1
Combat aviation brigades	11	8	10	7	10	7
Other multifunctional support brigades	28	50	24	46	29	44
Functional brigades	46	55	34	52	44	52

Source: RAND analysis.

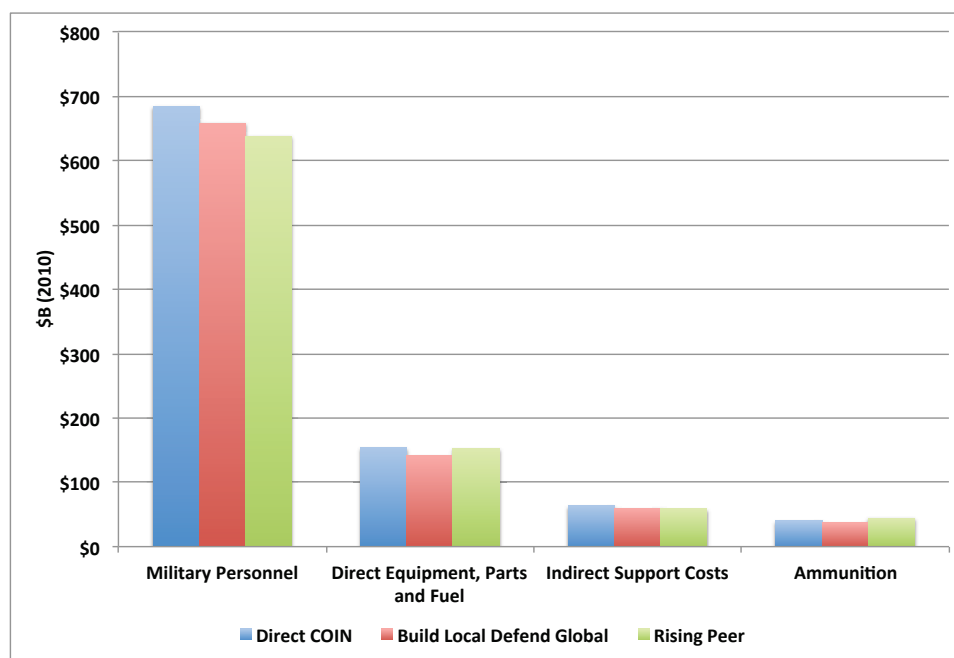
Figure 3.1: Notional Depiction of Strategies' Transition Costs over a 20-Year Period



Source: RAND Analysis

Figure 3.2 depicts the 20-year military personnel and operations and maintenance costs to maintain forces appropriate to each strategy. The analysis is consistent with what intuition would suggest. Not surprisingly, the Direct COIN alternative is most expensive, since it is largest in size. As the figure indicates, changes in military manning account for the bulk of cost differences. At \$684B in constant dollars, the Direct COIN operational Army's military personnel expenses over 20 years are \$26B more expensive than those of the Build Local Defend Global (\$658B) and \$46B more expensive than those of the Rising Peer operational Army. The larger Army also incurs the greatest costs for equipment, parts, and fuel. The Build Local Defend Global Army is least expensive, while the highly capitalized Rising Peer Army is almost as expensive to maintain as the Direct COIN Army. While the Build Local Defend Global Army is larger, it has less equipment than the other two and thus less need for spare parts and fuel.

Figure 3.2: Alternative Strategies' Operations and Support Requirements, FY2010–2029



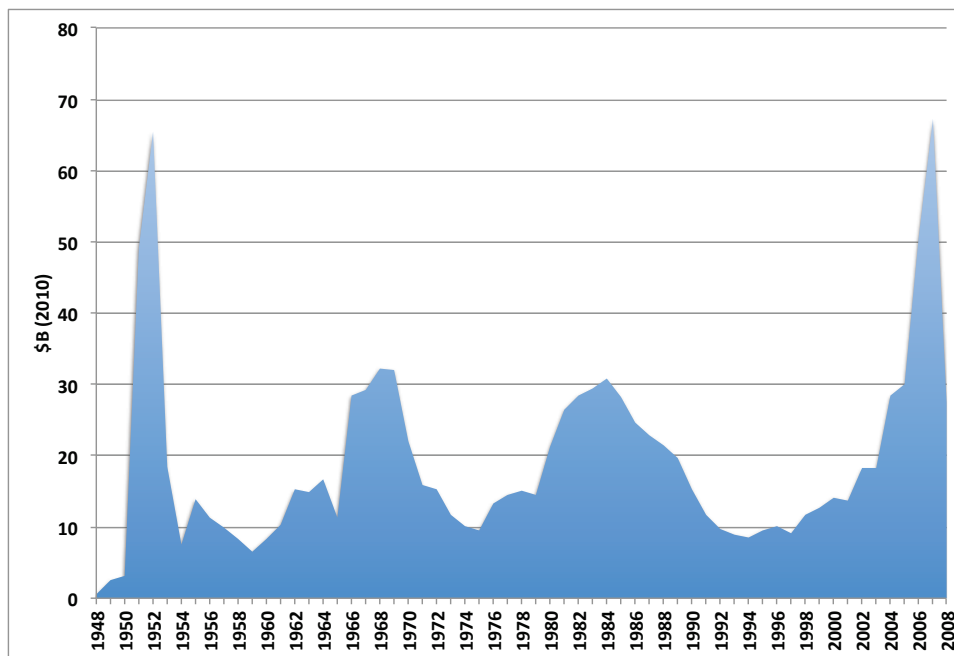
Source: RAND Analysis of data provided by the Office of the Assistant Secretary of the Army for Financial Management and Comptroller.

Procurement Costs

The data provided by OASA (FM&C) included the costs to replace units' complete sets of equipment. To estimate the 20-year costs for acquisition, we multiplied this

amount by the number of modernization cycles likely under a given strategy. Based on historical experience, we estimated that the Army would recapitalize once every 20 years under normal circumstances, the situation we thought would obtain in both the Build Local Defend Global and the Rising Peer strategy. Figure 3.3 illustrates this circumstance. The Army underwent major modernization efforts in the early 1960s under Kennedy, in the mid-1980s under Reagan, and had embarked on another such effort in 2000.

Figure 3.3: Army Procurement Spending, 1954–2009



Source: Under Secretary of Defense (Comptroller), National Defense Budget Estimates for FY 2010, Washington, D.C.: Department of Defense, 2009.

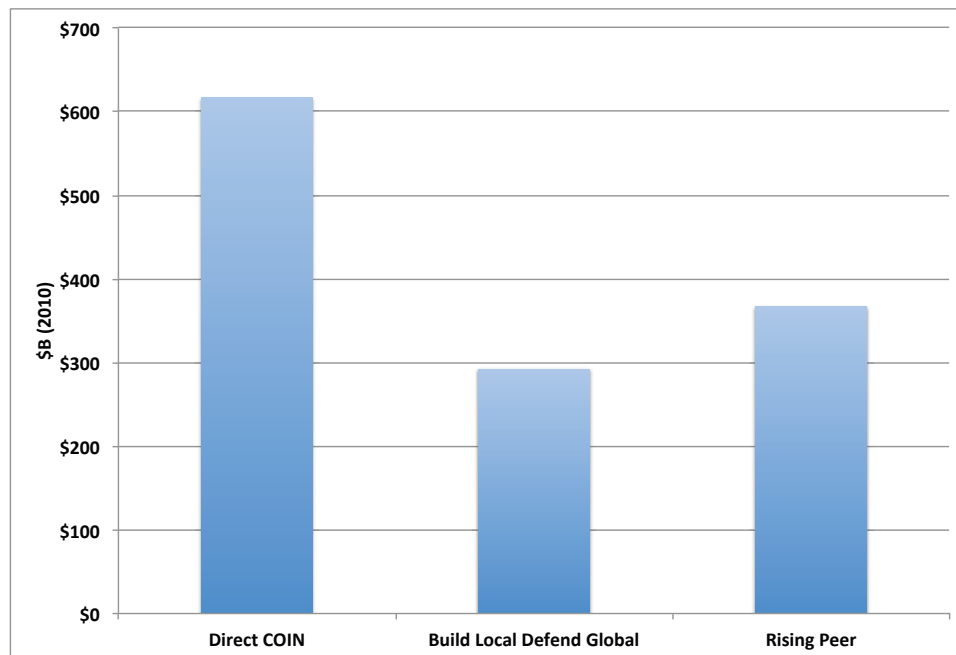
We also assumed that the Army would essentially recapitalize once during every protracted conflict. That is not to say that the Army would actually replace *all* of its equipment. Rather, the combination of replacing damaged equipment, buying new equipment adapted specifically to the operational environment like the Mine Resistant Armor Protected (MRAP) vehicle, and buying more of existing equipment, faster, is roughly equivalent to a recapitalization effort. Figure 3.2 also illustrates this dynamic, with a major war-related spike in procurement spending in the late 1960s,²³ and another

²³ The 1967 spike in procurement spending was principally war-related. In Congressional testimony in support of the FY 1966 budget, Secretary of Defense McNamara stated that the proposed decline in defense spending represented the completion of the FY 1962 modernization program. See U.S. Senate, *Department of Defense Appropriations for Fiscal Year 1966: Hearings Before the Committee on Armed Services and*

one beginning around 2004. The 1960s example is particularly salient. The cost of the programmed modernization from 1962 to 1966 amounted to approximately \$60B, while the response to Vietnam from FYs 1967 to 1972 exceeded \$100B. Similarly, Army procurement spending in the FY 2003 President’s Budget exceeded that planned in the Army modernization program by an amount greater than the increment over the baseline because of the modernization cycle itself. This reflected the fact that the Army was attempting to simultaneously modernize and fight, both of which generated substantial capital funding requirements.

Applying this logic to procurement over the period 2010–2030, we get the results depicted in Figure 3.4. Over a 20-year period, all three alternatives will have to recapitalize simply to replace aging stock. Because the Direct COIN strategy assumes

Figure 3.4: Projected Operational Army Acquisition Requirements, FY 2010–2029



Source: RAND Analysis of OASA (FM&C) data.

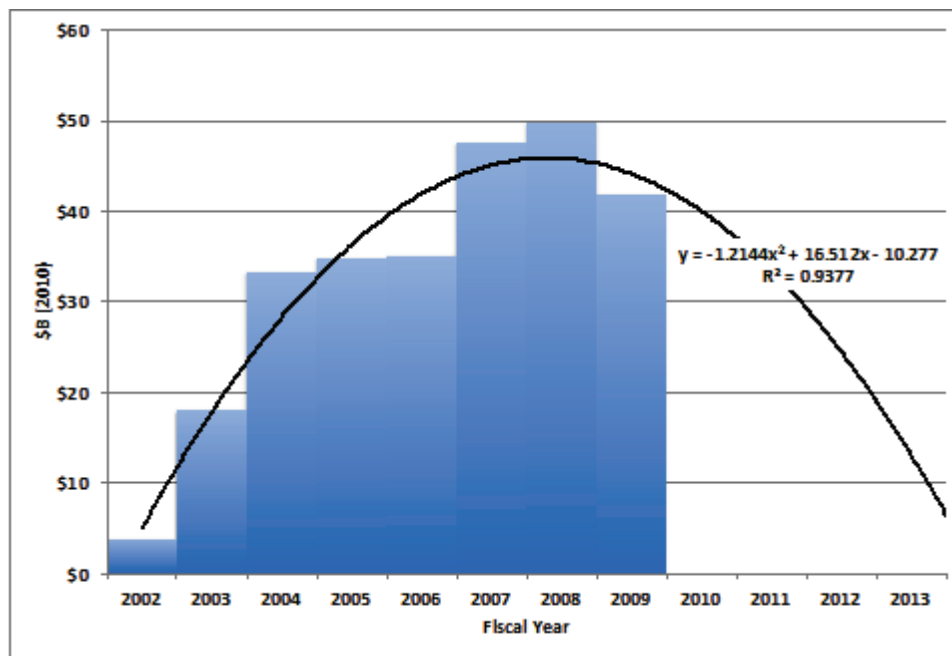
the Subcommittee on Department of Defense Appropriations, 89th Cong., 1st Session, Washington, D.C.: U.S. Government Printing Office, 1965, p. 80. In 1967, he testified that the spike in capital spending resulted mostly from war-related spending, such as fielding a new airmobile division and providing ammunition and other replacement equipment to forces in Vietnam; see U.S. Senate, *Department of Defense Appropriations for Fiscal Year 1967: Hearings Before the Subcommittee on Department of Defense of the Committee on Appropriations and the Committee on Armed Services*, 89th Cong., 2nd Session, Washington, D.C.: U.S. Government Printing Office, 1966, p. 103-7.

that conflict is not merely possible but likely, we also assume another major conflict will take place during that time frame, essentially forcing the Army to recapitalize for the war as well. Because we assume that the Army for the Rising Peer strategy will buy technologically advanced, and hence more expensive, equipment when it recapitalizes, we assume that equipment will be 25 percent more expensive.

Extraordinary Costs of Operations

We then estimated the extraordinary costs of operations, or the costs Army forces would incur conducting the contingency operations envisioned under a particular strategy. To derive an estimate for these costs, we looked at the trajectory of SAG 135, “Additional Activities,” from October 2001 (FY 2002) onward, as depicted in Figure 3.5.

Figure 3.5: Modeling the Extraordinary Costs of Operations (Additional Activities)



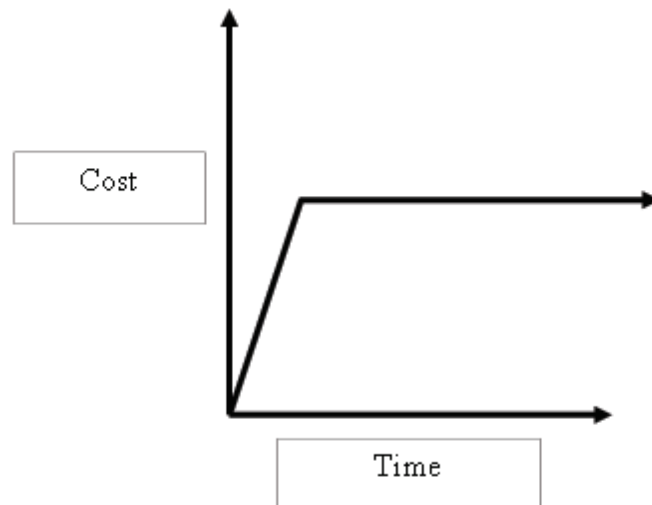
Source: RAND Analysis of Budget Execution Data, SAG 135, Additional Activities, FY 03–FY 11 Budget Justification Documents.

“Additional Activities” are the category under which the active component’s additional costs incurred in ongoing operations are consolidated. What is important about the data depicted in Figure 3.5 is not the specific shape of the curve, but rather that there is a curve at all. Wars are highly contingent events, in which action and intensity ebb and flow with circumstances on the battlefield. One would thus expect costs to vary at least

somewhat irregularly. The model depicted by the trendline in Figure 3.5, however, which conforms to the data with a very high correlation coefficient, is very regular.

The high degree of correlation implies that the resulting estimates for near-term expenditures possess a fair degree of accuracy.²⁴ There are other conceivable models, of course, like that depicted in Figure 3.6, which feature a sharp escalation and an indefinite period of constant expenses. The model in Figure 3.5 also conforms to the pattern of insurgencies generally during this century. In that pattern, counterinsurgents generally take a few years to recognize the emergence of the insurgency, then attempt to address it with gradually increasing levels of effort. At some point, these efforts culminate in a maximum level of effort, as with Sir Gerald Templar's implementation of the Briggs Plan

Figure 3.6: Alternative Model for Predicting the Extraordinary Costs of Operations



in Malaysia or U.S. efforts in Vietnam in 1967. That effort either succeeds or fails, after which the counterinsurgents' level of effort gradually declines. As indicated in a recent RAND monograph, this pattern generally goes on for about ten years. Events in Iraq have conformed to this pattern fairly closely.²⁵

²⁴ We do not mean to suggest that the course of current conflicts, reflected in costs, follow some sort of mechanistic pattern in which time is the independent variable. Rather, the high correlation coefficient (r^2) indicates that there is *an* independent variable or consistent set thereof, whose effects are likely as long as the U.S. is involved in its current set of overseas contingency operations.

²⁵ See Ben Connable and Martin C. Libicki, *How Insurgencies End*, Santa Monica, Calif.: RAND Corporation, MG-965-MCIA, 2010, p. xii.

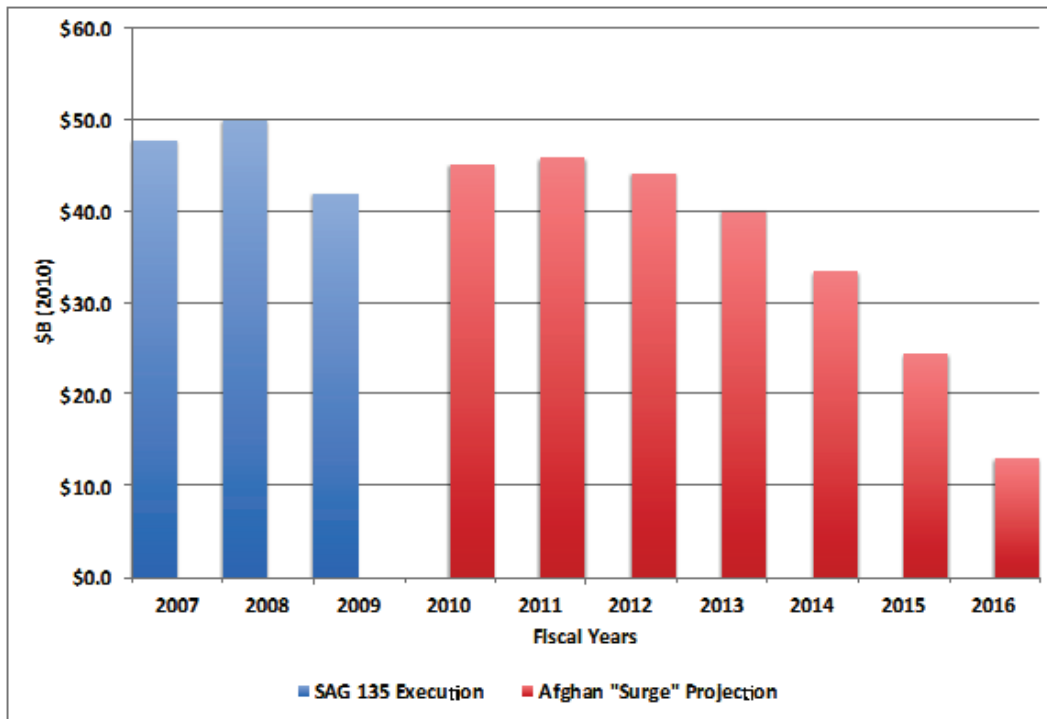
Thus, based on a conflict's estimated length and the point the United States has reached in it, we can estimate the extraordinary cost of Army operations by integrating the area under the curve. Such an estimate assumes that intensity, duration, and scope of future conflicts will approximate those of today. As the basis for an estimate of costs, such assumptions are not implausible.

Contingency operations are funded from more than one SAG, of course. For that reason, it is also necessary to estimate costs for reserve components' additional operations and maintenance expenses, as well as additional active component personnel and other requirements. Unlike SAG 135, "Additional Activities," these costs appeared to follow no observable pattern, as conveyed by Figure 3.7.²⁶ For that reason, we simply estimated the requirement by taking the annual average of these various appropriations, budget activities, and SAGs, a figure amounting to about \$7.6B annually. We used that average as an estimator for the annual costs for the extraordinary cost of operations across these categories.

In the period under consideration, each alternative would incur some of these costs, since operations in Iraq and Afghanistan would be ongoing. As Figure 3.7 suggests, we projected that operations in Iraq would conclude in about 2013. Toward the conclusion of this study, President Obama announced the Afghan surge. Thus, to arrive at a rough estimate of expenses to conclude Operation Enduring Freedom, we assumed that costs would repeat the trajectory followed from 2006 forward, starting in 2010. That is, we simply treated 2010 as if it were 2006, and applied the model depicted in Figure 3.5 from that point forward. The result is shown in Figure 3.7. To that, we added the average of military personnel, RDTE, and reserve components operations and maintenance discussed previously, \$7.6B annually, resulting in a total of \$245.7B in FY 2010 dollars.

²⁶ Data are taken from available supplemental appropriations requests from the website of OASA (FM&C). These requests are probably incomplete and thus present an inaccurate picture. Military Personnel, Army (MPA) expenditures are improbably low, for example. This is one of the reasons we used an average.

Figure 3.7: Projecting Costs for the Remainder of Operation Enduring Freedom

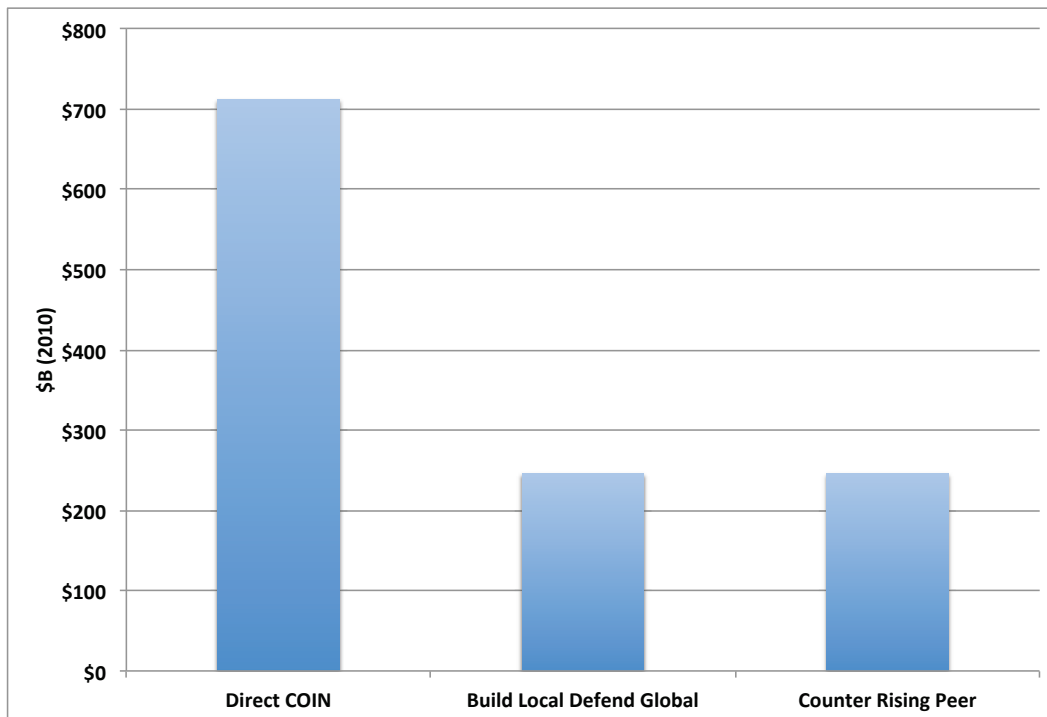


Source: RAND analysis.

Looking forward, the Direct COIN strategy assumes frequent conflict. Indeed, that strategy assumes the direct application of U.S power is necessary to counteract risks arising from instability. Therefore, we estimated that it would require sufficient resources to support another war. The resulting estimate is depicted in Figure 3.8. As shown, extraordinary costs of operation for the Direct COIN Army exceed \$700B in constant 2010 dollars, more than double the estimate for the other two strategies.

As the foregoing discussion indicates, there is considerably more art than science in estimating extraordinary costs of operation. Analysts may want to focus entirely on the costs of maintaining the operational Army to support a given strategy. Those costs are more or less implied by the force structure, while extraordinary costs of operation result from highly contingent decisions about whether and how to employ that force structure. Still, to the degree that alternative defense strategies differ in their proclivity to employ the armed forces, it is important to capture those requirements somehow.

Figure 3.8: Alternative Strategies' Estimated Extraordinary Costs of Operation, FY 2010–2029



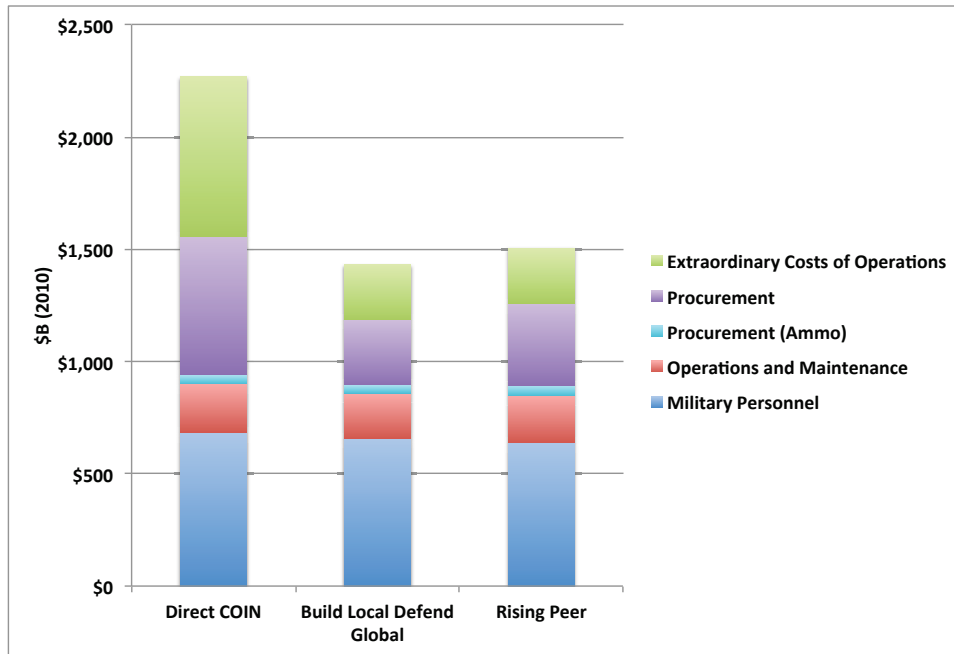
Source: RAND analysis.

Summary and Conclusions

Figure 3.9 depicts alternative strategies' resource implications for the operational Army over the period FY2010–2029. The Direct COIN strategy implies considerably higher costs than the other two, about three-quarters of a trillion dollars. Most of these higher costs are attributable to that strategy's higher probability of conflict. The near certainty of conflict under that strategy essentially doubles the estimate of procurement requirements. It more than doubles the estimate for extraordinary costs of operations. It is eminently possible to quibble with the specifics techniques used to derive these estimates. One should not lose sight of the resulting insight, or actually reminder: conflict adds substantially to costs for defense, and any strategy that anticipates conflict will be significantly more expensive than those that do not. Cheaper is not always better, however. If adversaries are intent on aggression, such costs are unavoidable. Indeed, these costs may even be greater because they were not anticipated.

In this chapter, we described how we derived operational Army costs consequent to changes in defense strategy. The method described here resembles those already in use within DoD, especially Total Army Analysis (TAA). It makes use of many of the same tools, particularly multi-service force deployment documents (MSFDDs) and the

Figure 3.9: Aggregate Estimates of Alternative Strategies' Operational Army Costs, FY 2010–2029



Source: RAND analysis.

FORCES Cost Model (FCM). We can use these tools to derive a plausible force structure and estimate its operations and support costs. Historical data allow analysts to estimate the extraordinary costs of operations. Our principal insight is that a relatively small team of analysts can employ these tools within a short period of time to produce relatively accurate, rough-order-of-magnitude estimates of alternative strategies' relative costs.

Of course, the costs incurred directly by the operational Army comprise only a subset of Army costs, even for operations and maintenance. The Army's generating force must organize, train, equip, and project that operational Army, as well as perform other functions specified in Title 10, Para 3013(b). The next chapter explains our approach to estimating these requirements.

4. Estimating Generating Force Costs

This chapter describes a method for estimating generating force costs under alternative defense strategies. The key underlying assumption is that future generating force costs will approximate past requirements under similar conditions. As Mark Twain put it, “History does not repeat itself, but it does rhyme.”

Briefly, the method for estimating generating force costs involves aligning generating force functions with the appropriations and sub-activity groups (SAGs) comprising the Army budget. Based on this alignment, we project future generating force costs for each appropriation and SAG based on how they have varied in response to changes in strategy and the operational Army over time. Our analysis indicates that Army size is only one of several major drivers of generating force costs, and perhaps not even the most important. Instead, seven key factors drive generating force costs:

- The level of ***operational commitment***, operationalized as the number of BCTs or soldiers deployed
- ***Army size***, including active and reserve component forces
- The degree of ***modernization*** desired, defined in terms of anticipated annual procurement expenditures
- ***Operational intensity***, expressed as the average number of casualties anticipated annually
- ***Operational environments’ diversity and complexity***, a qualitative judgment expressing both the range of potential environments to which Army forces will probably be committed and their complexity
- The Army’s approach to ***combat developments***, whether it is a *deliberate* quest to dominate the spectrum of operations or an *accelerated* approach to respond to battlefield developments
- The degree of ***strategic responsiveness*** required, which drives Army expenditures for strategic mobility, Army prepositioned stocks (APS).

The chapter begins by reviewing how the Army defines the generating force and how generating force activities relate to the Army budget. Next, the chapter illustrates our approach to modeling generating force costs through a set of examples. Each example illustrates one of the major kinds of variable that drive generating force costs. Finally, the chapter illustrates the application of the proposed method to the notional strategies being used in this study.

Projecting Generating Force Costs

Our approach to projecting how generating force costs might vary with strategy follows four steps:

- Align individual Army budget appropriations and sub-activity groups (SAGs) with generating force processes as defined by DA PAM 100-1, *Force XXI Institutional Army Redesign* (1998).
- Identify causes of variation in each SAG or appropriation.
- Develop models for estimating future costs in each SAG or appropriation.
- Refine and iterate as more data become available.

The sections that follow explain each step in greater detail.

Aligning Generating Force Core Functions with the Army Budget

As explained in Chapter 2, the key to understanding what the generating force needs in order to support alternative strategies lies in understanding what the generating force does. As defined by Army doctrine, the *generating force* consists of “those Army organizations whose primary mission is to generate and sustain the operational Army’s capabilities for employment by joint force commanders.”²⁷ DA PAM 100-1 identifies fourteen core processes:

- Planning and policy development
- Direction and assessment
- Acquire, train and sustain people
- Identify and develop leaders
- Develop doctrine
- Develop requirements
- Support organizational training
- Tailor, mobilize, and project land power
- Acquire, maintain, and sustain equipment
- Maintain and sustain land operations
- Acquire and sustain infrastructure
- Operate installations.

Generating force functions align relatively cleanly with Army appropriations, budget activities, or SAGs. This alignment allows us to equate generating force costs with the costs recorded in these SAGs. Chapter 2 explained the logic behind this alignment, and we will not recapitulate it here. Appendix B indicates the alignment.

²⁷ FM 1-01, 2008, Glossary, p. 4.

Identifying Key Variables

To derive relevant independent variables, we studied how Army budget activities and sub-activity groups have changed over the period FY 1995 through FY 2010 in order to understand the likely range and causes of variation from year to year. We started by identifying a floor for each budget activity or sub-activity group—a level of resourcing below which Army expenditures seldom sank. We then investigated any significant increases above or decreases below this floor in order to identify the conditions under which the resourcing levels had changed. As we went through this process, the categories described in Table 4.2 emerged as logical groupings. Understanding why, and by how much, each SAG, appropriation, or budget activity varied provided the basis for subsequent estimates.

The research team relied on data found in the Army’s annual budget justifications and “President’s Budget Highlights” for the period from FY 1995 to FY 2010. Each year, the Army prepares at least one justification book for each appropriation. For large and complex appropriations, like operations and maintenance or procurement, the Army typically prepares several of these books.²⁸ The budget justifications present the overall resourcing level requested by the Army for that fiscal year and include both the current and previous years’ total appropriations and expenditures. Figure 4.1 depicts the FY 10 summary of Budget Activity 1, Operating Forces. Current and past-year figures include all actual and planned expenditures, including bridge and supplemental funding. The justification books also explain any significant changes from the previous year’s budget, whether accounting changes resulting from a given program’s transfer from or to a given sub-activity group, or real program increases and decreases. We also made extensive use of the so-called “Green Books,” formally known as the *National Defense Budget Estimates*.

The Army prepares budget justifications for both its base budget and its wartime requirements. These latter are known as supplemental requests, denoting that they supplement the funds provided in the base budget to cover the costs of ongoing operations. Of late, supplemental funding has also been called “OCO,” or Overseas Contingency Operations, funding. Congress also passes “bridge” funding resolutions, which function something like a continuing resolution for wartime requirements. Under a “bridge,” Congress continues to fund contingency operations at the previous rate until a more comprehensive supplemental appropriation can be passed.

²⁸ The budget information we relied upon can be found on the Assistant Secretary of the Army (Financial Management and Comptroller)’s public website. As of February 26, 2013: <http://www.asafm.army.mil/offices/office.aspx?officecode=1200>

Figure 4.1: Example of Data Found in Army Budget Justifications

				(\$Thousands)		
Operation and Maintenance, Army						
Budget Activity 01: Operating Forces				FY 2008	FY 2009	FY 2012
Land Forces				4,229,646	4,667,446	4,782,218
2020A	111	Maneuver Units		912,584	951,440	1,020,490
2020A	112	Modular Support Brigades		118,205	103,760	105,178
2020A	113	Echelons Above Brigade		553,522	576,895	708,038
2020A	114	Theater Level Assets		786,213	924,697	718,233
2020A	115	Land Forces Operations Support		1,099,730	1,157,471	1,379,529
2020A	116	Aviation Assets		759,392	963,183	850,750
Land Forces Readiness				3,082,970	3,161,470	3,414,538
2020A	121	Force Readiness Operations Support		1,952,840	1,827,144	2,088,233
2020A	122	Land Forces Systems Readiness		466,163	638,804	633,704
2020A	123	Land Forces Depot Maintenance		663,968	695,522	692,601
Land Forces Readiness Support				58,990,173	44,983,360	10,724,342
2020A	131	Base Operations Support		6,696,593	7,172,012	7,586,455
2020A	132	Sustainment Restoration and Modernization		2,979,315	2,555,776	2,221,446
2020A	133	Management and Operational Headquarters		274,515	284,138	333,119
2020A	134	Combatant Commands Core Operations		127,825	188,251	123,163
2020A	135	Additional Activities		48,911,925	34,505,133	0
2020A	138	Combatant Commands Direct Mission Support		0	278,050	460,159
TOTAL BA 01: Operating Forces				66,302,789	52,812,276	18,921,068

Source: Department of the Army, *Fiscal Year (FY) 2010 Budget Estimates, Operations and Maintenance, Army: Justification Book*, May 2010.

Table 4.1 lists the key variables, defines them and indicates the quantifiable proxy variables that represent them in the model. The next section will explain how the research team identified these variables.

Developing Models at the SAG Level

Armed with these data and our understanding of the dynamics that seemed to drive costs at a macro level, we then developed models for estimating costs for each SAG. Our objective was to develop a set of models that conformed to the patterns we had observed, responded to a limited set of independent variables, and provided a roughly plausible forecast of how requirements in that SAG would respond to a change in strategy. Where possible, we derived a mathematical model using statistical analysis. When regression analysis could not produce a plausible model, or when documentary evidence contradicted that model, we developed algorithms that modeled the dynamics observed in our historical analysis.

To develop the regression-based models, we began by compiling a set of workload factors for the last decade. Those factors included annual measures of Army endstrength, reserve component soldiers mobilized, BCTs deployed, procurement expenditures, and so

Table 4.1: Key Variables Affecting Generating Force Resource Requirements

Category	Definition/Description	Variable
Army size	The size of the total Army, and of its components. While it seems intuitively obvious that the overall size of the Army substantially affects the size and composition of the generating force, the effects are mostly indirect. Army size primarily affects operations and maintenance Budget Activity 3, Recruiting and Training, and the number of personnel associated with this activity. It affects principally the “acquire, train and sustain people” core processes and, to a lesser extent, the “acquire, maintain and sustain equipment” core processes.	<ul style="list-style-type: none"> • Total Army endstrength • Active component endstrength • ARNG endstrength • USAR endstrength • Average on active duty strength • Sudden expansion (indicator or dummy Variable) • ARNG mobilized • USAR mobilized
Operational commitment	This category describes the actual or anticipated degree to which the Army will find itself committed to ongoing operations. It covers the extent and the duration of the anticipated commitment. For instance, the Army finds itself heavily committed at present with two ongoing counterinsurgency operations of extended duration in Iraq and Afghanistan. World War II, on the other hand, covered a large part of the planet but only through the termination of hostilities. The nature and degree of anticipated operational commitment dictates both the readiness construct used, either surge or cyclic, and whether or not the reserve components must function as an operational reserve. This category affects the “tailor, mobilize and project landpower” and the “support organizational training” core processes.	<ul style="list-style-type: none"> • Soldiers deployed • BCTs deployed
Operational intensity	Operational intensity speaks to the degree to which combat is anticipated, with attendant human casualties and material battle damage. It affects health care expenditures, procurement and depot maintenance. Operational intensity affects the “acquire, train and sustain people” and the “maintain and sustain land operations” core processes.	<ul style="list-style-type: none"> • Total casualties
Operational environments’ diversity and complexity	This category speaks to the relative complexity of the tasks Army forces will be called upon to execute. Counterinsurgency operations are extremely complex, and demand at least a basic understanding of the political, military, economic, social, informational and infrastructural context in which operations take place. More traditional combat operations emphasize understanding one’s own capabilities and their employment. Preparing for the latter, though not necessarily less demanding than preparing for counterinsurgency, requires less variation. Thus, the degree of sophistication that operational Army leaders require affects the generating force’s size and composition. This category affects the “leader development” and “support to organizational training” core processes, to name the most prominent.	<ul style="list-style-type: none"> • Indicator, or dummy variables • High • Medium • Low
Required strategic responsiveness	Strategic responsiveness denotes how quickly the Army must respond, in a contextually appropriate fashion, to crises. This category affects how much the Army spends on power projection, including transportation assets like “roll-on, roll-off” vessels, transportation infrastructure such as railheads and pre-positioned assets. If the Army is already decisively committed, strategic responsiveness declines in funding, if not necessarily in importance. If, however, the Army anticipates having to project forces to different theaters of operation with little notice, that would dictate significant investment. This category affects the “tailor, mobilize and project landpower” core process.	<ul style="list-style-type: none"> • Indicator variable • High • Low

Category	Definition/Description	Variable
<p style="text-align: center;">Combat developments emphasis</p>	<p>In peacetime, the Army needs to expend considerable resources in order to anticipate the threats and opportunities presented by the emerging strategic context. The Army then translates this hard-won understanding into “leap-ahead” capabilities that can represent a quantum improvement over existing capabilities. For instance, the M-1 Abrams tank possessed revolutionary advances in armored protection, power plant and fire control over its immediate predecessor, the M-60. The Army calls this “deliberate” combat development. In wartime, the Army strives to adapt existing technologies rapidly to ongoing operational requirements based on experience. In this example, mine-resistant armor-protected vehicles (MRAPs) represent a large-scale, but hardly revolutionary, materiel adaption to the current operational environment. This category mostly affects the “develop doctrine” and “develop requirements” core processes.</p>	<ul style="list-style-type: none"> • Indicator, or dummy variables • Accelerated • Deliberate
<p style="text-align: center;">Modernization</p>	<p>This encompasses the frequency and scope of modernizing the Army’s capital stock. Within the generating force, it affects research and development expenditures, which are most responsive to procurement spending. As noted, the Army undergoes a major recapitalization cycle about once every 20 years under peacetime conditions, and once during every major conflict.</p>	<ul style="list-style-type: none"> • Programmed procurement

forth. Next, we attempted to correlate changes in those values with changes in expenditures by SAG, trying various combinations of variables until we arrived at a sufficient degree of correlation, with an r^2 greater than or equal to 0.7 being preferred. Values exceeding 0.5 were acceptable.

In the following sections, we explain some models we derived for various SAGs and appropriations in the Army Budget. We offer examples for each of our major categories. We selected these examples based on three major criteria. First, these examples touch on some of the major claimants on Army resources, e.g., base operations (SAG 131) and research, development, test, and evaluation (RDTE). Second, they also illustrate the impact of at least one of the major categories of variables identified in Table 4.1. Finally, they illustrate the occasional tension between the results of our statistical and documentary analysis. Readers should consider the resulting models and accompanying explanations to be illustrative of a particular approach. They are by no means comprehensive. In effect, we are recommending that analysts study variation in scores of SAGs and appropriations. We commend the approach, but make no claim that the resulting models are final and authoritative. The research team would recommend further analysis and refinement to analysts in the Departments of Defense and Army.

SAG 137, Reset, Varies with Operational Commitment

SAG 137, Reset, funds maintenance necessary to repair equipment worn or damaged in overseas contingency operations to a fully mission capable status. It is much harder to track Reset execution, because the Departments of Defense and Army did not consolidate

Reset funding into a single SAG until FY 2006.²⁹ We attributed Army maintenance requirements listed in the FY 05 DoD Supplemental Request and the FY 04 supplemental appropriations for depot maintenance to Reset retroactively.³⁰

Those obstacles having been acknowledged, Reset requirements are clearly aligned with operational commitment. The question is which variable reflects that relationship most clearly and simply. As Figure 4.2 indicates, the total number of BCTs deployed seems to foreshadow Reset requirements. In other words, the best predictor of SAG 137 execution is the number of BCTs deployed the year before. A time series regression of reset requirements yields the following model:

$$\text{Reset}_t = \$.29615B * \text{Avg_BCTs_Deployed}_{t-1} + \$.326054B, \text{ adjusted } r^2 = .6718 \quad (4.1)$$

Because we were interested in the aggregate resources required under a given period, we substituted the average number of BCTs deployed over that period for the number deployed in a particular year, then multiplied the result by the period's duration. The resulting model is depicted in Equation 4.2.

$$\text{Reset}_{\text{Period}} = \text{Period} * (= \$.29615B * \text{Avg_BCTs_Deployed}_{\text{Period}} + \$.326054B) \quad (4.2)$$

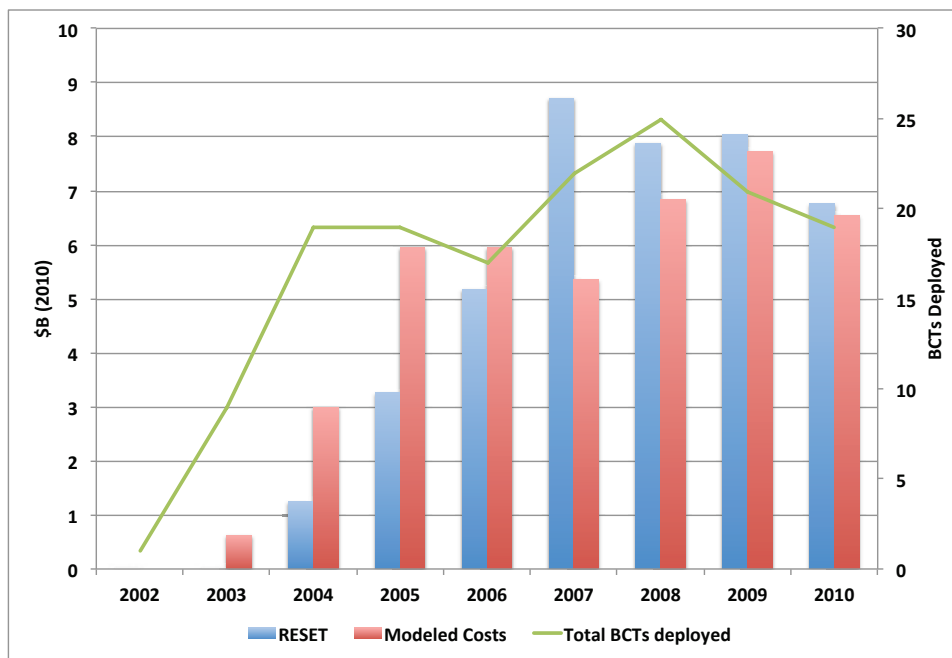
Equations 4.1 and 4.2, as well as the other mathematical models indicated in the rest of these examples, include a constant term, e.g., \$.326054B. This constant indicates a fixed cost component for the SAG or appropriation.

Table 4.2 indicates the Reset costs associated with the three different illustrative strategies. The Direct COIN strategy's costs vastly exceed those of both the Build Local and Defend Global Strategy because the former strategy presumes a high level of nearly continuous operational commitment, around 20 BCTs.

²⁹ The first mention of SAG 137, Reset, is in the FY 2008 Supplemental Budget Estimate. See OASA (FM&C), *Department of the Army Supplemental Budget Estimate: Operations and Maintenance, Army, Justification Book – Amendment*, Washington, D.C.: Department of the Army, 2007, p. 6.

³⁰ See Office of the Under Secretary of Defense, Comptroller (OUSD(C)), *Department of Defense for Operation Iraqi Freedom (OIF) and Operation Enduring Freedom, and Operation Unified Assistance*, Washington, D.C.: Department of Defense, 2004, p. 7, and OASA (FM&C), *Department of the Army Fiscal Year (FY) 2005 Biennial Budget Estimates: Vol.1, Operations and Maintenance, Army, Justification Book*, Washington, D.C.: Department of the Army, 2004, p. 126. Subsequent references to budget justifications books will include the fiscal year, appropriation, and the phrase “Budget Justification.” For example, this reference would be “Army FY 2005 OMA Budget Justification, p.126.”

Figure 4.2: SAG 137, Reset Budget Execution Compared with Projected Requirements and BCTs Deployed



Source: Budget execution data from National Defense Budget Estimates over the period FY 2004 through FY 2012; active component endstrength figures derived from budget justifications for Military Personnel, Army.

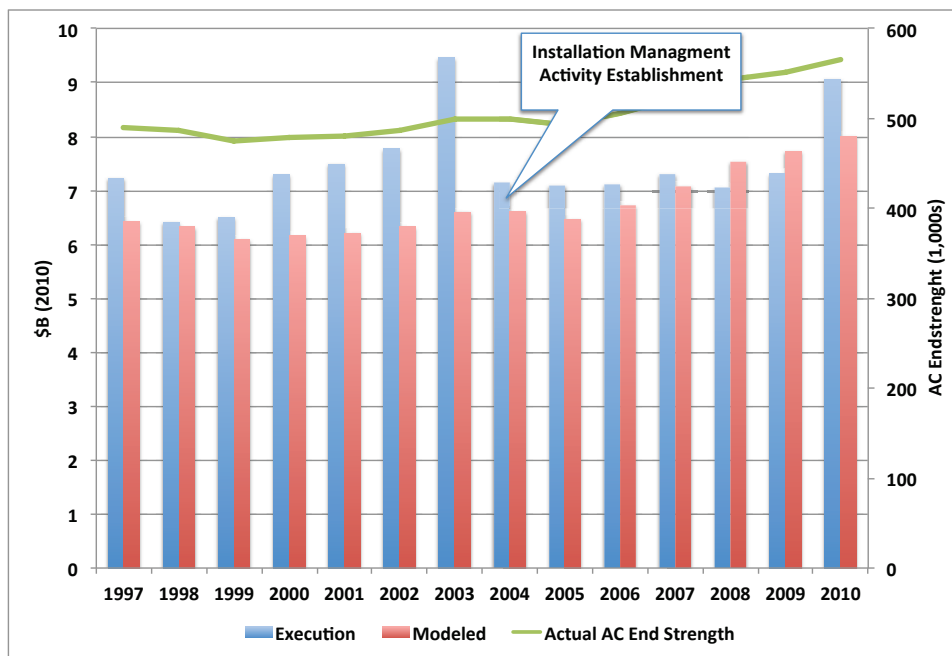
Table 4.2: SAG 137, Reset Costs Under Alternative Strategies, FY 2010–2029

	Direct COIN	Build Local Defend Global	Rising Peer
BCTs committed	20	3.5	3.5
Reset costs (\$B FY 10)	125.0	27.3	27.3

SAG 131, Base Operations Support Varies with Army Size

SAG 131, Base Operations Support, funds installation support services. Before 2004, the Army funded base operations under several different functionally aligned SAGs. Operating forces had a base operations SAG, as did training operations and recruiting and examining. Figure 4.3 consolidates those different base operations funding lines.

Figure 4.3: SAG 131, Base Operations Budget Execution Compared with Projected Requirements and Active Component End Strength



Source: Budget execution data from National Defense Budget Estimates over the period FY 2004 through FY 2012; active component endstrength figures derived from budget justifications for Military Personnel, Army.

In 2004, the Army consolidated its base operations under the management of the Installation Management Activity (IMA), which quickly evolved into the Installation Management Command (IMCOM). As part of this consolidation, the Army transferred responsibility and funding for several functions and activities to other SAGs, explaining the significant decline in funding from FY 2003 to FY 2004.³¹

Accordingly, the model for this SAG is remarkably simple, given how big a share of the Army’s operations and maintenance budget it commands. Active component endstrength appeared to be the proxy variable with the greatest predictive power among the several we tried, which included BCTs deployed, soldiers deployed and soldiers on active duty, a figure that includes mobilized reservists as well as active duty soldiers. Thus variations in Base Operations Requirements are tied to the Army size.

As indicated by Figure 4.3, budget execution basically follows Army end-strength. A time series regression analysis results in the following model for annual requirements:

³¹ OASA (FM&C), *Department of the Army Fiscal Year (FY) 2004/2005 Biennial Budget Estimates: Vol. 1, Operations and Maintenance, Army Justification Book*, Washington, D.C.: Department of the Army, 2003, p.131-10.

$$\text{SAG 131}_{\text{Year}} = \$0.0211167\text{B} * \text{Avg AC Endstrength}_{\text{Year}} \text{ (in 1,000s)} - \$3.943253\text{B},$$

$$r^2 = .5288. \tag{4.3}$$

We adapted that model by substituting the average endstrength over the period and multiplying the result by the period’s duration, as indicated in Equation 4.4 below.

$$\text{SAG 131}_{\text{Period}} = \text{Period} * (\$0.0211167\text{B} * \text{Avg AC Endstrength}_{\text{Period}} \text{ (in 1,000s)} - \$3.943253\text{B}) \tag{4.4}$$

As noted, base operations support costs vary with the number of personnel in the active component Army, as indicated in Table 4.3. The analytic results reflect that variation. The Direct COIN Army is once again the most expensive under this analysis because it is also the largest Army in terms of active component strength.

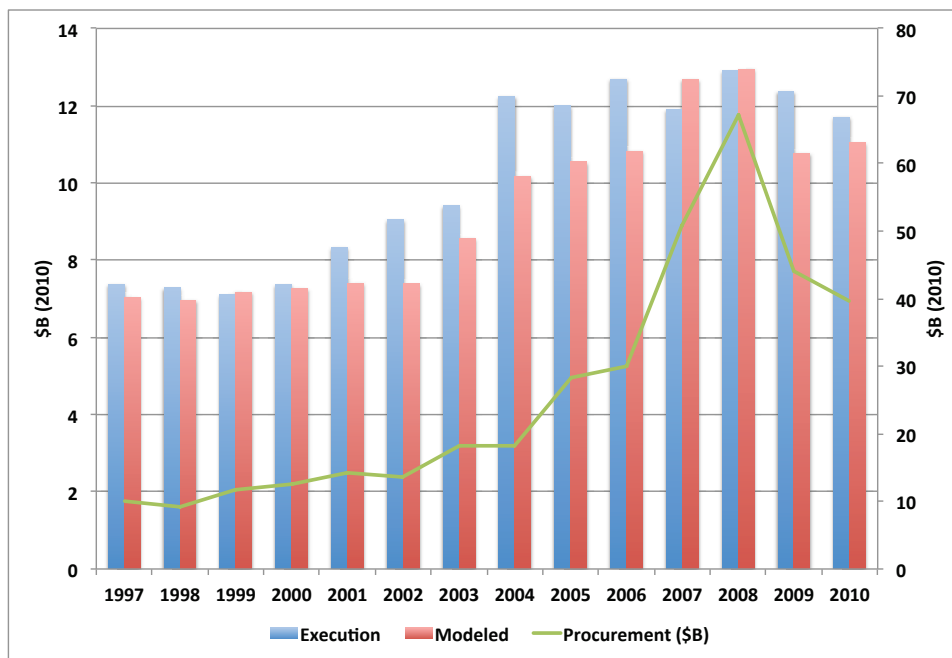
Table 4.3: SAG 131, Base Operations Costs Under Alternative Strategies, FY 2010–FY 2029

	Direct COIN	Build Local Defend Global	Rising Peer
Avg. AC endstrength	547K	500K	480K
BASOPS costs (\$B FY 10)	152.2	132.3	123.9

Research, Development, Test and Evaluation (RDTE) Varies with Modernization and Operational Intensity

It is a little more complicated to explain RDTE expenditures than to model them. That is because statistical analysis indicates that procurement mostly drives RDTE, but procurement is itself largely a function of modernization or operational commitment. The bulk of RDTE expenditures go to test and evaluation, with a much smaller and generally consistent allocation to basic and advanced research. As we observed in Chapter 3, peacetime modernization tends to occur in 20-year cycles. During wartime, the Army tends to buy the equivalent of a whole new inventory of capital stock. As shown in Figure 4.4, actual RDTE execution tended to rise with procurement, albeit less steeply.

Figure 4.4: Army RDTE Budget Execution Compared with Projected Requirements and Army Procurement Expenditures, FY 1997–2010



Source: Budget execution from National Defense Budget Estimates, FYs 1997–2010; modeled figures from RAND analysis.

Our statistical analysis of RDTE expenditures confirmed a strong relationship between RDTE and procurement. It also indicated a statistically significant correlation between operational intensity, measured in overall casualties, and RDTE expenditures. This correlation makes sense; the search for technological solutions intensifies with combat. One need only consider the emergence of the Rapid Equipping Force, the Rapid Fielding Initiative, or the Army’s Task Force Counter IED (Improvised Explosive Device), which later became the Joint IED Defeat Organization (JIEDDO). No remotely similar effort characterized earlier U.S. interventions in the Balkans. Our statistical analysis resulted in the following model:

$$RDTE = \$.087439B * Procurement \text{ (in \$B)} + \$.2668654B * Casualties \text{ (in 1,000s)} + \$.616291B, \text{ with an adjusted } r^2 = .73. \quad (4.5)$$

To estimate RDTE requirements over a given period, we substituted the average procurement anticipated over the period for the annual procurement and the average casualties anticipated for annual casualties. For relatively short-term estimates, such as over the FYDP, analysts can simply adjust the programmed procurement to account for adding or dropping specific major programs. For longer-term estimates, analysts can use the procurement estimates developed in the course of estimating operational Army

procurement needs. Casualties are a more sensitive topic, in that it is difficult to forecast how many casualties may occur in a given contingency, and even more difficult to make even general estimates without specific analysis. We suggest that analysts scale estimates of anticipated casualties by relating the size and intensity of anticipated contingency operations to OEF or OIF. In any case, having estimated the average procurement and average casualties incurred over the period, analysts then multiply the result by the period’s duration.

$$RDTE_{\text{Period}} = \text{Period} * (\$0.087439\text{B} * \text{Avg_Procurement (in \$B)} + \$0.2668654\text{B} * \text{Avg_Casualties (in 1,000s)} + \$6.161291\text{B}) \tag{4.6}$$

Table 4.4 illustrates how assumptions about the level of modernization and operational intensity affect RDTE costs. The Direct COIN strategy posits near-continuous, large-scale operational commitment, which we assume will cause the Army to replace its capital stock twice over the 20-year period.

Table 4.4: RDTE Costs Under Alternative Strategies, FY 2010–2029

	Direct COIN	Build Local Defend Global	Rising Peer
Avg. procurement (\$B FY 2010)	31.8	14.6	19
Avg. annual casualties	5.1K	0	0
RDTE Costs (\$B FY 10)	206.1	148.8	156.5

Source: RAND analysis.

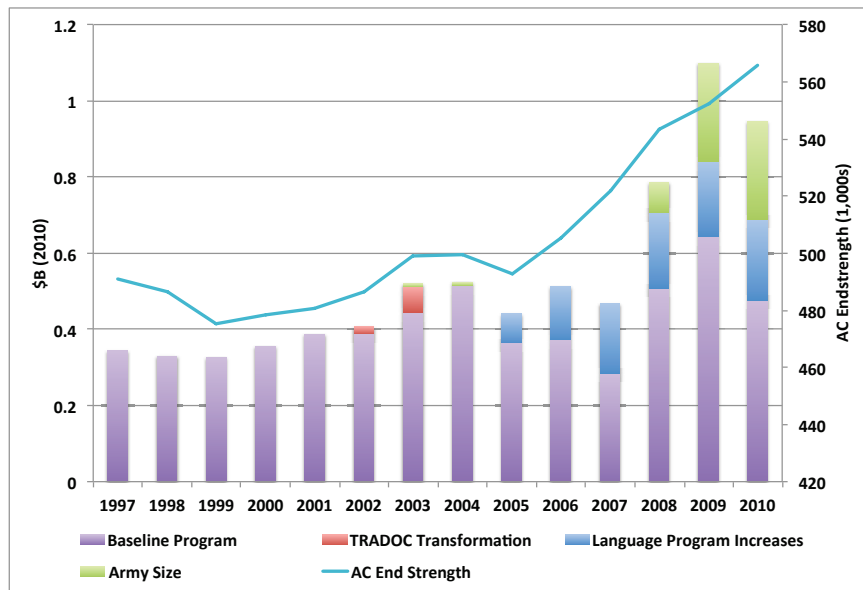
SAG 321, Specialized Skill Training, Varies with Operational Environments’ Diversity and Complexity, Army Size and Modernization

SAG 321, Specialized Skill Training, funds MOS-specific training provided to new recruits, basic and advanced officer education, and branch-specific professional education for noncommissioned officers. Most importantly, it funds the language program at the Defense Language Institute.

Modeling SAG 321 presents an analytic dilemma. On the one hand, as Figure 4.5 indicates, SAG 321 execution correlates very closely with AC Endstrength (teal line). On

the other hand, documentary evidence contraindicates that easy explanation. In 2002 and 2003, for instance, Army Budget Estimates justify requested increases of \$14.9M and \$38.4M (current dollars), respectively, by citing TRADOC [Training and Doctrine Command] Transformation, with an additional \$11.2M in FY 2004. The additional funding terminated in FY 2004.³² We associate these changes with modernization. Applying a 2010 deflator to the estimate, we came up with a figure of approximately \$85M per major modernization episode.

Figure 4.5: SAG 321, Specialized Skill Training Budget Execution Compared with Active Component Endstrength, FY 1997–2010



Source: Execution data from National Defense Budget Estimates, FYs 1997–2010; AC Endstrength from Military Personnel, Army (MPA) Budget Estimates, FYs 1997–2010; attribution per Operations and Maintenance, Army (OMA) Budget Estimates, FY 1997–2010. Attribution is only partial.

Starting in 2005, budget estimates attribute substantial increases in funding to improvements in the Defense Language Institute program, reaching a peak of \$212M (constant 2010 dollars) over the baseline language program in 2010. Needless to say, neither this increase nor the increase aligned with TRADOC Transformation is attributable to changes in Army size. We attribute changes in funding for the language program to the diversity and complexity of the operational environment. High diversity and complexity are associated more with the counterinsurgency environment anticipated

³² Army FY 2002 OMA Budget Justification, p. 321-7; Army FY 2003 OMA Budget Justification p. 321-8; Army FY 2004 OMA Budget Justification, p. 321-8.

by the Direct COIN strategy than with the more-conventional environment envisioned in the Rising Peer strategy.

Starting in 2008, however, SAG 321 budget estimates cite substantial increases in the training load to justify requests for increased funding. We should also note that these justifications also cite the operational environments' increased complexity and diversity as the need for the increases, as with the need to maintain instructor student ratios in the interrogator course.³³ On balance, however, we associate these changes in funding level to changes in Army size.

Translating this analysis into a model required the exercise of some judgment; several of the trends under way follow a trajectory that had yet to reach its end in 2010. An average taken at that point might overestimate cumulative costs for a given conflict. For instance, one would expect the language program to decline to something close to its 2003 baseline as wars in Afghanistan and Iraq conclude. Similarly, the extent of increases in SAG 321 attributable to Army size from 2008 forward, increases totaling about a third of the FY 2008 requirement, owes something to their suddenness; the Army grew, but not by one-third. With those disclaimers in mind, we made the following assumptions about resourcing levels:

- Resource “floor:” \$450M, the average of budget execution between FY 2003 and 2010
- Operational environments' diversity and complexity:
 - High: An additional \$212M per annum, consistent with FY 2010 spending levels.
 - Medium: An additional \$170M per annum, the average of the period FY 2003 through FY 2010. A “medium” level of diversity and complexity corresponds with a focus on the particular operational environments to which the Army is committed on a large scale, as has occurred with Afghanistan and Iraq. This figure assumes peaks and valleys in requirements as wars begin and wind down.
 - Low: No additional requirements over baseline.
- Army size:
 - For sudden increases, such as the recent effort to “Grow the Army,” we estimate \$600M per episode, the same cost incurred in FY 2008 through FY 2010.
 - In terms of recurring expenses, we estimate a fraction of baseline expenditures proportional to the size of the increase over the Army's FY 2007 endstrength. In this case, the FY 2010 endstrength of 566,000—a level of Army strength

³³ Army FY 2008 OMA Budget Justification, p. 296; Army FY 2009 OMA Budget Justification, pp. 249–250.

associated with the Direct COIN strategy—represents an 8 percent increase over the FY 2007 endstrength of 522,000. Eight percent of the baseline expenditure or “resource floor” of \$450M is \$36M. Thus, the annual rate of expenditure would be \$36M for a 566,000-man active component.

- Modernization: We estimate an additional \$85M for each major modernization episode.

Table 4.5 illustrates the application of these models to the strategies under consideration. Operational environments’ diversity and complexity is assumed to be “medium” in the security environment for which the Direct COIN force is optimized; Army forces will be deeply and extensively involved in a few major theaters of operations. Diversity and complexity will be much higher under the Build Local Defend Global strategy, since Army forces will be scattered across the globe, albeit in much smaller packages than under the Direct COIN strategy. The Rising Peer strategy posits a low level of diversity and complexity. Army size is larger under the Direct COIN strategy and smaller under the two alternatives. We assume two major modernization episodes under the Direct COIN strategy, as the Army adapts and replaces its equipment to the two or large wars this strategy anticipates.

Table 4.5: SAG 321, Specialized Skill Training Costs Under Alternative Strategies, FY 2010–2029

	Direct COIN	Build Local Defend Global	Rising Peer
Operational environments’ diversity and complexity	Medium	High	Low
Army size	566K	500K	480K
Increase in Army size over 2007 endstrength	8%	–4%	–8%
Major modernization episode	2	1	1
SAG 321 costs (\$B FY 10)	12.4	13.2	9.0

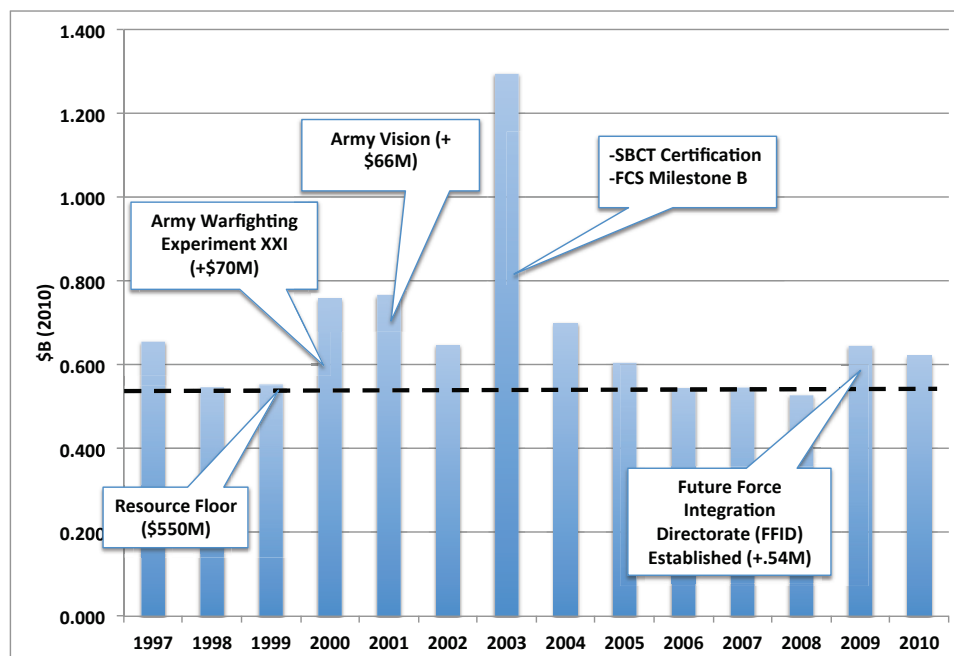
Source: RAND analysis.

SAG 122, Land Forces Systems Readiness, Varies with Combat Developments Emphasis and Army Modernization

As its title suggest, SAG 122 funds maintenance support, albeit mostly contractor logistics support for specific systems. More important, it also funds combat development activities across the Army. Figure 4.6 shows SAG 122 budget execution from FY 1997 through FY 2010. We could not establish a statistical correlation with any of the proxy variables we had identified, so we employed a more qualitative approach to developing our model, relying on our analysis of the documents.

Looking back across recent history, we established a resource floor of \$550M in constant 2010 dollars. We then examined Army budget justification documents to understand the major variations in budget execution over the time frame. We attributed expenditures above the resourcing floor from FY 2000 through FY 2005 to what was then known as Army Transformation, an ambitious modernization effort intended to fully harness the power of information technology to ground combat. As indicated in Figure 4.6, FY 2000 saw a \$70M (current dollars) increase in current dollars to fund Army Warfighting Experiment (AWE) XXI. AWE XXI was part of the effort to field “digital divisions” equipped with the Force XXI Battle Command Brigade and Below

Figure 4.6: Land Forces Systems Readiness Budget Execution, FY 1997–2010



Source: Budget execution data taken from National Defense Budget Estimates, FYs 1997–2010; explanatory data per Operations and Maintenance, Army Estimates, FYs 1997–2010.

System (FBCB2).³⁴ The next year saw a \$66M (current dollars) increase to fund combat developments activities associated with the Army Vision.³⁵ Programmed funding declined slightly in FY 02, and then saw a major, unexplained increase in FY 2003 of about \$500M, which was recorded but not explained in the FY 2005 OMA Budget Justification.³⁶ Quite a lot happened in 2003: Operation Iraqi Freedom began, the Future Combat Systems program underwent its Milestone B and the first Stryker Brigade Combat Team conducted its certification exercise. Because we could not attribute the increase to supplemental funding, we attributed it to combat development activities associated with Army Transformation. In short, funding levels between FY 2000 through FY 2006 were consistent with a period of deliberate combat developments in support of an aggressive peacetime modernization strategy. Including the significant swings in funding over the period, the Army spent an average of \$760M per annum in constant 2010 dollars over the FY 2000–2006 period. Subtracting our resource floor of \$550M, that amounts to an additional \$210M per annum over a seven-year period, resulting in an additional \$1.5B in total expenditures attributable to deliberate combat developments.

The period from FY 2007 through FY 2010 represents a period of accelerated combat developments. In FY 2007, the Army restructured the FCS program to focus on capabilities that could be fielded more rapidly to the current force.³⁷ It reorganized to support that new focus, establishing the Future Force Integration Directorate and Army Evaluation Task Force in FY 2009.³⁸ Over the FY 2007–2010 period, the Army spent an average of \$586M in constant 2010 dollars, a \$36M increment over the \$550M resource floor.

Our model for SAG 122, Land Forces Systems Readiness, reflects the foregoing analysis. We postulate a baseline rate of expenditure of \$550M (2010 constant dollars) per annum, to which we add \$1.5B for every major modernization effort during the period if the Army is pursuing a deliberate combat developments approach. Note that this requires the analyst to judge where the Army is in relation to its 20-year modernization cycle. For accelerated combat development strategies, we assume additional expenditures somewhere around \$36M in constant 2010 dollars annually.

³⁴ FY 2000 OMA Budget Justification, pp. BA 1–BA 19.

³⁵ FY 2001 OMA Budget Justification, p.122-10.

³⁶ FY 2003 OMA Budget Justification, p. 122-1 through 122-12; FY 2005 OMA Budget Justification, p.113.

³⁷ Andrew Feickert, *The Army's Future Combat System (FCS): Background and Issues for Congress*, Washington, D.C.: Congressional Research Service, 2008, p. 7; Francis J. Harvey and Peter J. Schoemaker, *2007 Army Posture Statement*, Washington, D.C.: Department of the Army, 2007, pp.10–11.

³⁸ FY 2009 OMA Budget Justification, p. 112.

$$\text{SAG 122}_{\text{Deliberate}} = \text{Period} * \$0.550\text{B} + \text{Major Modernization Episodes} * \$1.5\text{B} \quad (4.7)$$

$$\text{SAG 122}_{\text{Accelerated}} = \text{Period} * \$0.586\text{B} \quad (4.8)$$

Applying this model to the three strategies, we assume that the Direct COIN and Build Local strategies will pursue an accelerated combat developments strategy. The Rising Peer strategy assumes deliberate combat developments with one major modernization episode. Table 4.6 depicts the results of this analysis.

Table 4.6: SAG 122, Land Forces Systems Readiness Costs Under Alternative Strategies, FY 2010–2029

	Direct COIN	Build Local Defend Global	Rising Peer
Combat developments approach	Accelerated	Accelerated	Deliberate
Major modernization episode	NA	NA	1
SAG 122 costs (\$B FY 10)	11.7	11.7	12.5

Source: RAND analysis.

SAG 212, Army Prepositioned Stocks, Varies with the Degree of Strategic Responsiveness Desired

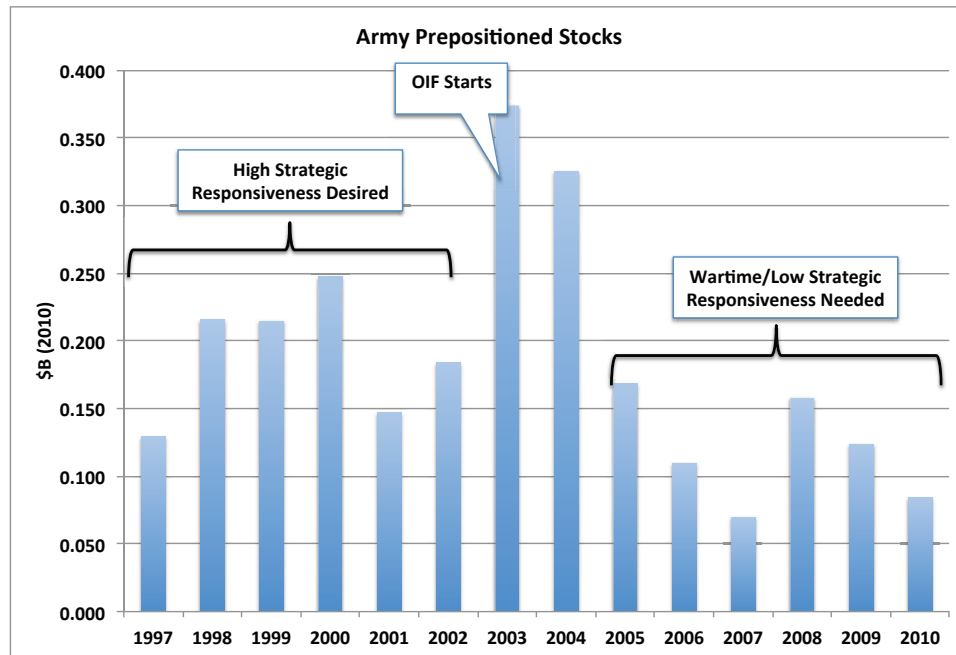
Figure 4.7 indicates no readily discernible pattern, an impression confirmed by our attempts at statistical analysis. Nonetheless, the perceived need for strategic responsiveness clearly drives requirements for Army prepositioned stocks. Therefore, we relied on the available qualitative data to derive a model, establishing estimators for APS requirements aligned with high, low, and wartime levels of strategic responsiveness.

To arrive at an estimator for high levels of strategic responsiveness, we took the average for the FY 1997–2002 period. During this period, the Army emphasized power projection. It was the heyday of the Army Strategic Mobility Program.³⁹ Prepositioned stocks served as a hedge against uncertainty. Expenditures averaged \$190M over this period. We used this figure as an estimator for annual expenditures during periods when a high degree of responsiveness was required. The Rising Peer Strategy, for example, postulates a high degree of strategic responsiveness.

³⁹ See discussion of the ASMP under the justification for SAG 211, Strategic Mobilization, in Army FY 2002 OMA Budget Justification, p. 211-1.

To arrive at our estimate for wartime needs, we considered the period from FY 2003 through FY 2010. In 2003 and 2004, budget justification documents attribute program increases to a repositioning of equipment from the APS set in Europe, of which a good deal went to Southwest Asia.⁴⁰ We attribute this redistribution to the anticipated onset of

Figure 4.7: SAG 212, Army Prepositioned Stocks Budget Execution, FY 1997–2010



Source: National Defense Budget Estimates, FYs 1997–2010.

Operation Iraqi Freedom. In FY 2005 and after, expenditures declined precipitously because the equipment was actually in use in theater.⁴¹ In FY 2007 and FY 2009, for example, the Army decremented this SAG by approximately \$34M annually.⁴² From these circumstances we inferred a general principle that the Army de-emphasizes the

⁴⁰ See the discussion of APS Program increases in the FY 2004 Operations and Maintenance, Army justification. Army FY 2004 OMA Budget Justification, p. 212-7. The justification speaks only of refurbishing the Southwest Asia contingency set, not of conflict, and of purchasing a substantial amount of War Reserve Secondary Items like chemical protective gear. It seems reasonable to infer that the Army was acquiring these as a hedge against combat usage. The FY 05 OMA Budget Justification records \$25M (current dollars) in supplemental funding in support of the Southwest Asia APS set in an appropriation of \$152M (current dollars) (Army FY 2005 OMA Budget Justification, 209), while the final execution was \$325M in constant FY 2010 dollars.

⁴¹ Army FY 2005 OMA Budget Justification, p. 211.

⁴² Army FY 2007 OMA Budget Justification, p. 175 and Army FY 2009 OMA Budget Justification, p. 198.

ability to prepare for unforeseen contingencies when it knows where it is fighting. We took the average execution from FY 2005 through FY 2010 in FY 2010 constant dollars, \$119M, as our estimator for APS requirements during conflict years. We also used that figure as our estimator for annual requirements when the need for strategic responsiveness was perceived as low for other reasons. We used the aggregate expenditures over and above this figure in FY 2003 and FY 2004 (\$460M in constant 2010 dollars, in aggregate) to provide us with the estimator for up-front costs associated with conflict.

Equations 4.9 and 4.10 depict the resulting models for APS costs during periods of high and low strategic responsiveness, respectively:

$$APS_{\text{High}} = \text{Period}_{\text{Peacetime}} * \$0.190\text{B} + \text{Period}_{\text{Conflict}} * \$0.119\text{B} + \text{Number of Conflicts Anticipated} * \$0.46\text{B} \quad (4.9)$$

$$APS_{\text{Low}} = \text{Period} * \$0.119\text{B} + \text{Number of Conflicts Anticipated} * \$0.46\text{B} \quad (4.10)$$

Table 4.7 indicates the results of this analysis. The level of strategic responsiveness desired is low under the Direct COIN and Build Local Defend Global strategies. Under these strategies, instability and insurgency are seen as the primary threat to U.S. interests. Neither threat is likely to emerge unexpectedly or require emergency deployments. The Rising Peer strategy requires a high degree of responsiveness, however, as the Army must be prepared to respond rapidly on a worldwide basis in order to deter a potential rival’s adventurism. As we have noted, we are assuming two major conflicts under the Direct COIN strategy, given the expectations of “persistent conflict.”

Table 4.7: SAG 212, Army Prepositioned Stocks Costs Under Alternative Strategies, FY 2010–2029

	Direct COIN	Build Local Defend Global	Rising Peer
Strategic responsiveness desired	Low	Low	High
Anticipated conflicts	2	0	0
Conflicts’ aggregate duration	20	0	0
SAG 212 costs (\$B FY 10)	3.3	2.4	3.8

Using the SAG-Level Models

The models described in the foregoing sections provide reasonable, first-order estimates of costs within a range of variation associated with each particular SAG. They are not sufficiently accurate to replace existing PPBS processes. Instead, they respond to trends in a plausible approximation of reality.

Projecting Generating Force Military Personnel Requirements

Generating force military personnel make up the other major component of generating force costs. The Army pays generating force civilians and contractors with operations and maintenance funds, but pays generating force military personnel from military pay accounts. To arrive at a rough estimate of the number of soldiers required by the generating force under alternative investment options and the associated resource requirement, the research team translated arguments made by major generating force commands in the context of the Institutional Army portion of Total Army Analysis for FY 2010–2015 (Institutional Army TAA 10-15) into rudimentary models. It was possible to associate those arguments with four of the seven categories of variables described previously:

- Army size
- Operational commitment
- Developing partners' capability and capacity
- Combat developments emphasis.

The resulting models allowed us to project the number of soldiers each organization would need in response to changes in these variables. Because the arguments on which those models were based were derived from “internal records that are deliberative in nature and are part of the decisionmaking process that contain opinions and recommendations,” they are exempt from disclosure under the Freedom of Information Act (FOIA).⁴³ More important, neither the research team nor any other independent agency has validated the arguments made in Institutional Army TAA 10-15. We will therefore not recount them here in detail here. The resulting projections could support a first order estimate of costs, but they do not provide a sufficient basis on which to allocate manpower. HQDA's Directorate of Force Management has been working with the RAND Arroyo center to improve these models since then.

⁴³ Directorate for Freedom of Information and Security Review, *DoD 5400.7-R, DOD Freedom of Information Act Program*, Washington, D.C.: Department of Defense, 1998, p. 35.

Projecting Generating Force Costs Under Alternative Strategies

Estimating generating force costs follows the same general template we used for estimating operational Army costs. The first step is to understand the operational Army's required size and force structure under that strategy. Estimating generating force costs differs from estimating operational Army costs in that analysts must focus on what the Army might be doing under a strategy, not just the operational Army's size and composition. Obviously, one of the things the Army must do is develop and sustain the operational Army envisioned in a given investment alternative. Army planners must also envision the degree of operational commitment, the nature of operations envisioned under the strategy, and the institutional support needed to develop capabilities required to support those operations. The analyst then applies the models described in the foregoing sections in order to estimate costs. The following sections explain the assumptions underpinning our modeling and provide examples of how those assumptions drive costs.

The Generating Force for the Direct COIN Strategy

The generating force's primary role in the Direct COIN strategy emphasizes its core capability to prepare and project the force. It must create that steady stream of forces to support ongoing operations. Coordinating units' and individuals' deployment, redeployment, and reconstitution is complicated enough. Because demand for forces significantly outstrips the supply of active component forces, the generating force must also continuously mobilize and demobilize reserve component forces. Regardless of component, all deploying units require predeployment training that prepares them for their specific operational environment. In the Direct COIN strategy, the number of countries in which the United States will conduct active counterinsurgency operations will be limited, and will thus limit the range of operational environments for which the operational Army must prepare. As indicated at the beginning of this chapter, variation in several factors determines generating force costs. The next several paragraphs describe the assumptions we are making with regard to each of the seven categories of variable.

Army Size. The Direct COIN strategy will require a large Army to sustain the persistent, large-scale conflict it accepts as being inevitable. Our estimates of Army size represent an extension of current trends. The Army to support the Direct COIN strategy will consist of 1.111 million soldiers, distributed as follows:

- Active Component: 547,000
- Army National Guard: 352,200
- Army Reserve: 205,000.

These were the planning figures for the long term expressed in the 2010 Army Posture Statement.⁴⁴

Those raw figures do not tell the whole story, however, since the Army will have to draw upon its reserve components to sustain persistent conflicts of indefinite duration. Taking averages from recent history, we estimate about 70,000 Army National Guard (ARNG) soldiers and 32,000 U.S. Army Reserves (USAR) soldiers will be mobilized annually, resulting in an average on-active-duty strength of about 650,000 soldiers.⁴⁵ Because the Direct COIN strategy anticipates this level of commitment, we forecast no sudden expansions in the Army size.

Operational Commitment. A high level of operational commitment distinguishes the Direct COIN strategy from the other two alternatives and most U.S. declaratory strategy in the post–Cold War era. Unlike the alternatives, it assumes that large-scale counterinsurgency and stability operations will be the rule and not the exception. Our proxy variable for operational commitment is the average number of BCTs deployed annually over the period. We assume an average of 20 BCTs deployed a year, which is the average the Army sustained since the initiation of Operation Iraqi Freedom. It is also the size of the force that Army officials planned to provide on a continuous basis in 2010.⁴⁶

Modernization. In consonance with its combat developments emphasis, the Army will spend less on acquiring advanced technology. Procurement expenditures, which drive RDTE requirements and partially drive requirements in several other SAGs, will be high as the Army replaces worn or damaged equipment and acquires other systems to cope with the demands of particular operational environments. Taking the estimate of procurement expenses for the operational Army indicated in Chapter 3, approximately \$617B, and dividing it by the strategy’s 20-year duration, we arrive at average annual procurement expenditures of approximately \$30.8B.

Operational Intensity. While lethality will not approach that of a major theater war, equipment will experience heavy use, requiring extensive recapitalization. We anticipate that operational intensity will match the combined intensity of both OIF and OEF combined, about 6,000 casualties annually.

⁴⁴ John M. McHugh, George W. Casey, Jr., and Kenneth O. Preston, *2010 Army Posture Statement*, Washington, D.C.: Department of the Army, 2010, p. 9. Referred to hereafter as *2010 Army Posture Statement*.

⁴⁵ Mobilization figures were drawn from OMA supplemental requests.

⁴⁶ *2010 Army Posture Statement*, p. 12.

Operational intensity affects military manpower requirements as well as fiscal requirements. The Army will need additional personnel to staff Warrior Transition Units or their future analog to care for war wounded, for example.

Operational Environments' Diversity and Complexity. We posit that the Direct COIN strategy will require large-scale interventions in operational environments approximately as complex and diverse as Iraq and Afghanistan. We would characterize this as a “medium” degree of complexity and diversity, since a large number of soldiers will require training in a few languages and cultures at a time. Soldiers will have to acquaint themselves with new cultural cues and norms, and the Army will have to adapt and augment its inventory of knowledge and cultural capabilities. While this strategy does not envision large-scale employment of advisors, developing indigenous forces is integral to virtually every approach to counterinsurgency and stability operations. The Army will have to train soldiers to undertake this mission.

Required Strategic Responsiveness. Insurgencies develop slowly, allowing U.S. decisionmakers and forces to respond to their demands in a deliberate fashion. The Army will be able to decrease its investment in such capabilities as Army prepositioned stocks and strategic mobilization.

Combat Developments Emphasis. Army combat development efforts will be devoted to adapting to operational environments to which Army forces have been committed. Under the Direct COIN strategy, we hypothesize that the Army will emphasize efforts to respond to actual, immediate challenges over preparing for long-term potential challenges. In Army parlance, this emphasis is known as *accelerated combat developments*.

The Generating Force for the Build Local Defend Global Strategy

Of the three strategic alternatives we explore, the Build Local Defend Global strategy may demand the most from the generating force. The generating force will have to undertake a wider range of activities than under either of the other two strategies. Army planners will not only have to consider how the U.S. Army must evolve to meet the demands of its strategic environment but will also have to anticipate partners' requirements, in order to develop the appropriate operational Army capabilities. The Build Local Defend Global strategy also demands wider ranging capabilities to develop the force, especially human capital. Soldiers in the advisory corps will require more education and training to enable them to cope with a wider range of cultures and languages than is the case in under the Direct COIN strategy, a requirement reflected in costs for SAG 321, Specialized Skill Training, among others. Moreover, U.S. Army schools will increase the number of foreign students admitted. The Army will be able to decrease the resources committed to preparing and projecting, however, as operational

tempo declines. Finally, strategic sustainment will require fewer resources because of the significantly reduced scale of operations.⁴⁷

Army Size. The Build Local Defend Global Army will be significantly smaller than the Direct COIN Army, especially its reserve components. Based on our analysis in Chapter 3, we assume an Army of just over a million soldiers, distributed across the three components as follows:

- Active Component: 500,000
- Army National Guard: 320,000
- Army Reserve: 185,000.

Under this strategy, we assume that the Army will substantially reduce its employment of the reserve components as an operational force in accordance on the trajectory depicted in Figure 4.8. We assume no mobilizations thereafter because the strategy assumes that U.S. forces will not be at war. The resulting estimates of the number of ARNG and USAR soldiers mobilized annually are 8,500 and 5,000, respectively. Thus, the average on-active-duty strength for the period will be 513,500.

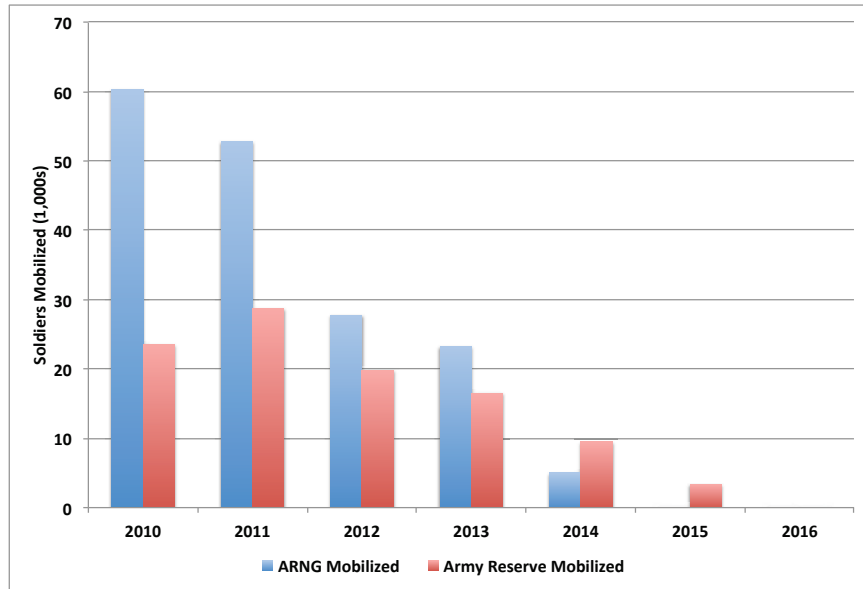
Operational Commitment. Operational commitment, while not nearly as heavy as that envisioned by the Direct COIN strategy, is not insignificant. This strategy envisions commitment of roughly a third of the advisory corps at any point in time. We simply assume that this will have the same effect on generating force costs as a BCT.

Even though the Build Local Defend Global strategy presumes avoidance or prevention of further conflict, the cost estimate must still include costs for residual operations in Afghanistan. The Rising Peer strategy must also account for these costs. We therefore need to estimate the average number of BCTs committed over the period. Figure 4.9 assumes a reduction in U.S. force levels from a high of 19 BCTs in Iraq and Afghanistan in FY 2010 to one BCT in Afghanistan by 2017. Under these assumptions, there will be an annual average of 3.5 BCTs deployed to Afghanistan. Obviously, that does not mean that there will be 3.5 BCTs there every year, but using that figure will enable us to model generating force costs. Thus, we assume an average of 4.5 BCTs deployed every year for modeling purposes.

Modernization. This strategy's implications for generating force modernization requirements flow from its assumptions about the operational Army. Essentially, the Army will simply replace its existing capital stock once over the 20-year period with effective, reliable, relatively low-cost equipment. Additionally, the Build Local Defend Global force structure has lower capital requirements, with fewer HBCTs and combat

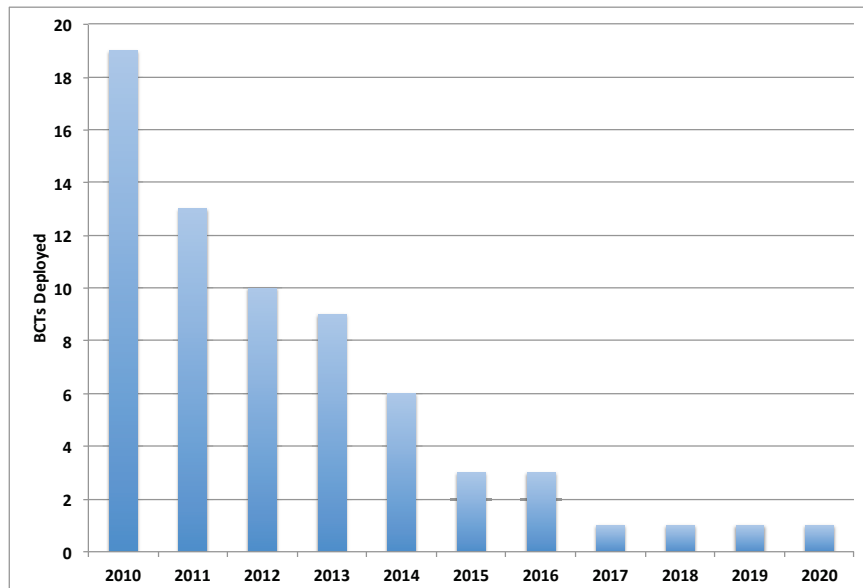
⁴⁷ The greater geographical dispersion and increased complexity of Army missions probably will partially offset the reduced scale of operations.

Figure 4.8: Projected Decline in Mobilization Under the Build Local Defend Global Strategy



Source: Figures for reserve components' mobilization in FY 10–3 taken from Overseas Contingency Operations estimates for Operations and Maintenance, Army; RAND analysis.

Figure 4.9: Projected Drawdown Brigade Combat Teams Deployed to Operations New Dawn and Enduring Freedom



Source: BCT figures from 2010 through 2013 taken from Overseas Contingency Operations estimates for Operations and Maintenance, Army; RAND analysis.

aviation brigades. Over the period from FY 2010 to 2029, the Army will spend an average of \$14.6B in constant 2010 dollars on procurement.

Operational Intensity. We assume a low degree of operational intensity. The Build Local Defend Global strategy seeks to avoid large-scale conflict, and posits that it can be prevented through prophylactic intervention. Nonetheless, the analysis must account for the residual effects of OEF. In FY 10, there were 4,891 casualties attributed to OEF. Dividing the total by the number of BCTs deployed gives a result of roughly 600 casualties per year per BCT committed. Applying that rough heuristic to the number of BCTs deployed per year according to Figure 4.9, we come up with an average casualty rate over the 20-year period of approximately 2,700 per annum.

Operational Environments' Diversity and Complexity will be high. This strategy postulates a high degree of involvement with a greater number of potential partners. While the absolute number of troops deployed at any given time will be relatively low, those operations will require a great many linguists and translators. Moreover, the advisory personnel serving on training and advisory missions will have to obtain at least rudimentary linguistic and cultural competence.

Combat Developments Emphasis. We posit that the Army will emphasize an accelerated combat developments approach. It will integrate lessons learned by its partners in the operational environments to which it is committed. This approach complements its conservative approach to modernization, which allows it to keep abreast of advances in military capabilities without seeking to “leap ahead.”

Strategic Responsiveness Required. While efforts to develop partners' security forces are long term and deliberate, much of the Army serves as a hedge against sudden aggression or the rapid deterioration of the situation in a partner nation. Accordingly, the Army will need to respond rapidly to any such crisis. On the other hand, the strategy assumes tactical overmatch in the event of any such crisis.

The Generating Force for the Rising Peer Strategy

Generating force costs will decrease as the strategic focus narrows. Given the ability to focus on traditional combat operations against a particular adversary, the Army will be able to reduce the resources devoted to directing and resourcing the force. Resources devoted to developing the force will remain relatively constant. Although the Rising Peer Army will require investment in human capital, it will require more investment in materiel and organizational capabilities in order to maintain tactical and operational overmatch. Power projection will assume increasing importance, given the uncertainty about the likely location of ground combat. Strategic sustainment requirements will also decline, given the emphasis on avoiding prolonged combat operations.

Army Size. As described in Chapter 3, this strategy presumes significant reductions in the Army size. The Army will focus on sustaining the combat power it can employ rapidly, and will accept risk with regard to sustaining combat operations over an extended period. We assume the following endstrengths:

- Active component: 480,000
- Army National Guard: 340,000
- Army Reserve: 200,000.

We assume the same average number of reservists mobilized over the period that we assume for the Build Local Defend Global strategy, for the same reason. Both strategies must account for the drawdowns in OIF and OEF.

Operational Commitment. Operational commitment will be low. This strategy assumes that forces will be used to deter, mostly through their existence, and combat will not actually be needed. Our estimates account for residual deployments in support of OIF and OEF.

Modernization. As described in Chapter 3, this strategy assumes a much higher degree of modernization than the other two strategies, albeit for a smaller force. We assume that equipment acquired for modernization will cost 25 percent more than that for either the Direct COIN or the Build Local Defend Global strategies, although the Army will only need to replace its stock once. Accordingly, we estimate an average procurement cost of \$19B annually over the period.

Operational Intensity. Operational intensity will be low, because of the low likelihood of actual combat.

Combat Developments Emphasis. The Army will emphasize a deliberate approach to combat developments, as it seeks technological advantage over near-peer competitors. While we do not posit an arms race, we assume that adversaries will continue to seek asymmetric technological and conceptual advantages.

Strategic Responsiveness Required. The Army for the Rising Peer strategy will require a high degree of strategic responsiveness. We assume that any crises that will emerge will do so suddenly and relatively unexpectedly, causing the Army to deploy rapidly over significant distances. More importantly, deterring adversaries will require a credible ability to respond effectively.

Alternatives Compared

Table 4.8 summarizes the different assumptions relevant to generating force costs under different strategies.

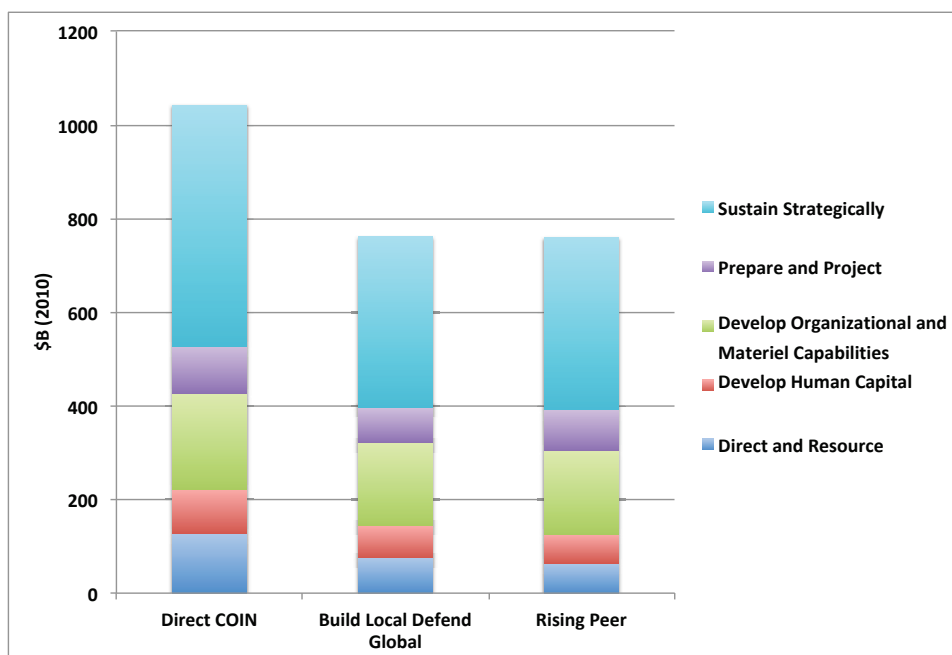
Under these assumptions, we estimate the different strategies require the resources depicted in Figure 4.10. The generating force for the Direct COIN strategy will require a

Table 4.8: Assumptions Governing Generating Force Resource Requirements Under Alternative Strategies, FY 2010–2029

Variables	Direct COIN	Build Local Defend Global	Rising Peer
Army Size	Large	Medium	Small
Active Component endstrength	547K	500K	480K
Army National Guard endstrength	358K	320K	340K
Army Reserve endstrength	205K	185K	200K
Army National Guard soldiers mobilized	70K	8.5K	8.5K
Army Reserve soldiers mobilized	32K	5K	5K
Average on active duty	650K	514K	493.5K
Operational commitment	4,000/year	2,700/year	2,700/year
BCTs deployed	20/year	4.5/year	3.5/year
Modernization	Wartime	Peacetime Low	Peacetime High
Average annual procurement	\$31.8B	\$14.6B	\$19B
Operational intensity	COIN	Peacekeeping and Engagement	Peacekeeping
Anticipated average annual casualties	4,000	2,700	2,700
Combat developments emphasis	Accelerated	Accelerated	Deliberate
Strategic responsiveness required	Low	High	High

Source: RAND analysis.

Figure 4.10: Estimated Generating Force Resource Requirements Under Alternative Strategies, FY 2010–2029



Source: RAND analysis.

little over \$1 trillion over twenty years. The Build Local Defend Global generating force will require approximately \$760B, as will the generating force for the rising peer strategy. The estimates reflected in Figure 4.10 do not reflect military personnel costs, though these would be required to provide a complete picture of costs.

Summary and Conclusion

In this chapter, we explained and illustrated our method for estimating generating force costs under alternative strategies. The fundamental insight that allowed us to do so is that the Army budget's structure aligns closely with generating force core processes. By understanding how the SAGs and appropriations respond to past changes in strategy, we can project how they will respond in the future. We found that a relatively small number of independent variables seem to drive costs in these SAGs and appropriations. These variables fall into the following seven categories:

- Operational commitment
- Army size
- Modernization
- Operational intensity
- Operational environments' diversity and complexity
- Combat developments emphasis
- Strategic responsiveness required.

As the list above indicates, strategy shapes the generating force just as it shapes the operational Army. Formerly, it was believed that the size and capabilities of the generating force were and should be a function of the size of the operational Army.⁴⁸ The reality is much more complex. Strategy requires the exertions of both the operational Army and the generating force. The operational Army cannot equip itself, deploy itself, or sustain itself, yet all these things are required if the Army is to support the national defense strategy. They are integral to Army operational capabilities.

It is therefore important to assess not only the adequacy of resources allocated to the generating force but also how they are allocated. Even though the generating force for the Build Local Defend Global and Rising Peer strategies require about the same amount of fiscal resources, \$760B over 20 years, they are allocated differently. The former requires more to develop human capital for its mission of developing partners' security capabilities; the latter requires more to prepare and project forces in the event of a major contingency operations. Prudent resource allocation would also hedge against the

⁴⁸ See, for example, John R. Brinkerhoff, *The Institutional Army, FY 1975–FY 2002*, Alexandria, Va.: Institute for Defense Analyses, 2002, p. S-1.

invalidation of key assumptions, resulting in a resourcing strategy that is least badly wrong across a range of plausible alternative future security environments. The next chapter describes our approach to this imperative.

5. Assessing Investment Options' Effectiveness

In order to ensure estimates of resources required to support alternative defense strategies are realistic, it is necessary to assess how well the associated investment options meet the demands of alternative strategies and their associated security environments. As indicated in Chapter 2, each alternative defense strategy responds to assumptions about the future security environment, the challenges it holds, and how those challenges respond to U.S. military capabilities. The Direct COIN strategy, for example, assumes that instability gives rise to terrorism and other threats to U.S. interests and that the only truly reliable counter to such instability is the direct application of U.S. military power. The Build Local Defend Global strategy makes the same assumption about the nature of the challenge but assumes that preventive military engagement to build partners' security capabilities can mitigate the risk of such instability. The investment options associated with each strategy reflect these assumptions.

Such assumptions are often wrong. Indeed, according to former Secretary of Defense Robert M. Gates, "We have never once gotten it right."⁴⁹ Thus, the measure of an investment option's prospective effectiveness cannot be solely how well it will work in the imagined environment to which it is ideally suited. Strategists and analysts must also assess how well the investment option will work if some or all of the assumptions on which it is based turn out to be wrong. The goal of such assessments is to identify the option that is least badly wrong across plausible alternative futures. In formal risk management terms, this quality is known as *robustness*.

Therefore, it is necessary to assess each investment option not just against the demands of its assumed future but also against the demands of futures assumed by the alternatives. Our tool for doing so is RAND's Portfolio Analysis Tool (PAT). PAT allows decisionmakers to apply their professional judgment in a structured, consistent manner that mirrors our proposed method. PAT provides an overall assessment of investment options' effectiveness based on how well each option meets the needs of the various combatant commands under a particular strategy, weighted by commands' relative importance under the strategy.⁵⁰ This chapter will explain how to apply PAT to the analysis of robustness in greater detail.

⁴⁹ Robert M. Gates, speech at the United States Military Academy, February 25, 2011. As of February 26, 2013: <http://www.defense.gov/Speeches/Speech.aspx?SpeechID=1539>

⁵⁰ The RAND Portfolio Analysis Tool was developed by Paul K. Davis and Paul Dreyer. For a definitive discussion of the theory and methods behind the tool, as well as a more comprehensive reference manual, see Paul K. Davis and Paul Dreyer, *RAND's Portfolio Analysis Tool (PAT): Theory, Methods, and Reference Manual*, Santa Monica, Calif.: RAND Corporation, TR-756-ODS, 2009.

Seeking Robust Options

Defense officials develop strategies based on their assumptions about the nature of the anticipated security environment. Unfortunately, point forecasts are often wrong. Repeated studies have found that “expert” projects are seldom more accurate than those made by laymen or even random selection.⁵¹ Prudent planners therefore seek to hedge against what might happen as well as what they think will happen.

Fortunately, forecasting is not an end in itself. Planners try to forecast the future in order to prepare for it. Risk managers approach this kind of analytical challenge by exploring alternative futures. Doing so helps them to identify the range of possible challenges, the combination of capabilities and capacity required for those challenges, and the range of demand. Armed with such an understanding, the Departments of Defense and Army can prepare themselves against a range of futures.

Having identified plausible ranges of demand for Army forces, planners can then assess how well investment options meet them. Each range of demand is associated with a particular strategy, and constitutes an “alternative security environment.” Prudent planners diversify their capabilities investments across a range of options that entail different degrees of cost, risk and return. Portfolio managers allocate resources to minimize risk and maximize return across a range of possibilities. They seek “robust” options.

The 2010 Quadrennial Defense Review used this approach. It evaluated Service and joint force structure options across three combinations of scenarios, or integrated security constructs (ISCs). Each ISC consists of a certain number of multi-service force deployment documents (MSFDDs—See Chapter 2 for further discussion), arrayed in time over several years. The force structure resulting from the QDR minimized risk across a number of different futures, not just a single future that planners considered most likely or most dangerous.⁵²

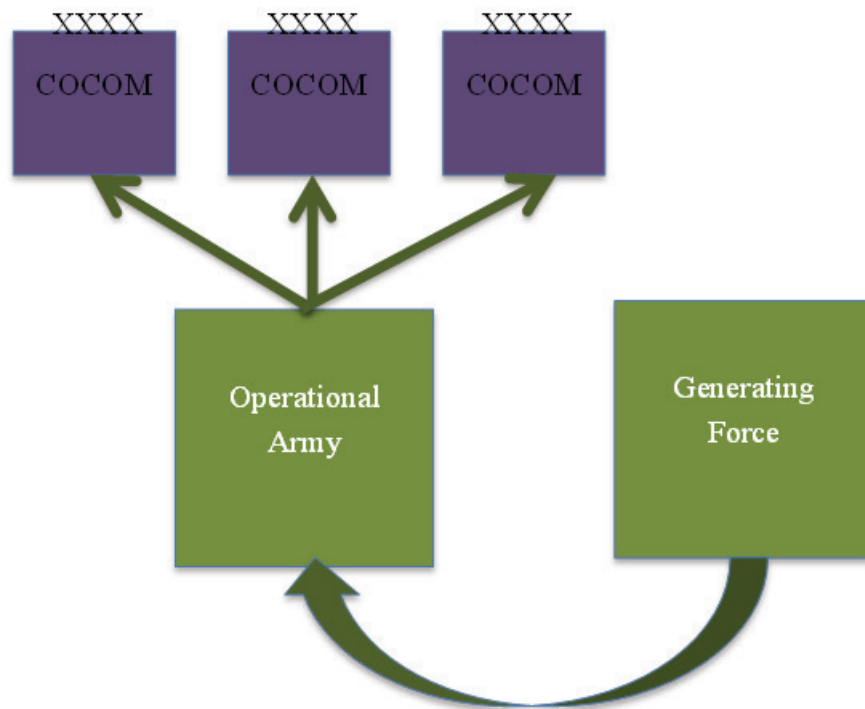
Army Strategic Effectiveness: A Conceptual Model

An assessment of the Army’s effectiveness in supporting alternative defense strategies must rest on a conceptual model for effectiveness. Our conceptual model is simple, as illustrated in Figure 5.1. In that model, the Army is effective as a force

⁵¹ For academic treatments of this issue, see Philip Tetlock, *Expert Political Judgment: How Good Is It? How Can We Know?* Princeton University Press, 2005, and et al., 2003. To see these analyses reflected from a policy perspective, see Danzig, 2011. Our approach to assessing investment options parallels Lempert’s in concept, though not necessarily in sophistication.

⁵² 2010 QDR, pp.41–47.

Figure 5.1: A Conceptual Model for Assessing Army Investment Options' Effectiveness



provider to the degree that its inventory of operational Army forces is adequate to meet combatant commanders' needs, and to the degree that the generating force is able to develop, maintain and sustain operational Army forces. The generating force also sustains Defense, joint, and other service capabilities to a significant extent, a responsibility subsumed under its responsibilities to the operational Army.

We can assess the degree to which operational Army forces meet combatant commander needs under a given strategy by comparing the forces combatant commands require under each ISC with the forces available to source those requirements. Obviously, the degree to which that inventory suffices to provide the forces required to a particular combatant command depends in part on the relative importance of the command and the operational need. It is also necessary to assess the degree to which forces provided have the right orientation to meet the challenges at hand. Several armored BCTs trained for high intensity combat may have the numbers needed for a stability operation, but their training might limit their utility.

The generating force is not broken down into similar individual units in the way that the operational Army is. There is no analog to the BCT—the aggregate capacity of any particular generating force capability does not consist of the sum of several essentially identical units. For that reason, we evaluate generating force capacity to perform a given

function by the degree to which resources allocated to that function match the resources needed as assessed using the methods described in Chapter 4. Assessing generating force capability requires more qualitative judgment—for example, as to whether the proposed generating force will be doing the right kinds of things, such as training soldiers for counterinsurgency or major combat operations.

Assessing Investment Options Using the Portfolio Analysis Tool

PAT promotes structured and transparent analysis of the adequacy of alternative force structure options. It presents an assessment of expected effectiveness of a force structure (in this case, Army force structures) in providing the forces combatant commands need. It employs a familiar and readily understood display: color-coded stoplight charts. At a glance, decisionmakers can absorb how an option scores in key measures—an integrated view of the portfolio, as it were. Whereas a simple stoplight chart is opaque, providing little detail on the criteria and assumptions behind top-level assessments, PAT provides full transparency by allowing a user to “drill down” on assessments to see the judgments behind them. Top-level assessments must have transparent supporting assessments. This enforces analytic discipline and promotes a structured approach to the question at hand. It also provides an audit trail that can bring areas of disagreement into focus and lead to constructive, iterative analysis where called for.

PAT is a structured analytic framework that can be put to many different uses. It can be used to examine national defense strategies or more specific investment options. It can draw on purely qualitative assessments, technical data, or a mix of both. While it is best used to compare alternatives before a decision is made, it can also be used to illuminate the assessment of a single option. Different users will bring different questions to the tool. For example, in previous RAND work on the resource implications of strategic change,⁵³ PAT was used in a substantially different fashion. That research configured the use of PAT to the Joint Staff, to consider how effective alternative defense strategies would be in achieving combatant command objectives. The present application also compares defense strategies using combatant commands as combatant commands, but it is structured to consider a different question: “How well does the Army provide the forces the combatant commands demand?” rather than “Are the forces effective in meeting strategic objectives?”

⁵³ Davis et al., 2008; Gompert et al., 2008.

The Assessment Taxonomy

For this study, we structured PAT to assess how well alternative Army investment options meet the needs of alternative national defense strategies. PAT provides three levels of assessment. We use these levels as described below:

- *Level 1 provides the aggregate assessment of how well each investment option meets the demands of the various security environments for which the alternative strategies were designed.*
- *At Level 2, the analyst or decisionmaker evaluates how well combatant commands and the generating force are able to meet the challenges of alternative security environments. They also assess the relative importance of the different combatant commands and the generating force to different alternative security environments. As discussed in Chapter 2, combatant commands are principally responsible for executing the defense strategy. Thus, in order to assess how well an investment option meets the demands of a particular defense strategy, it is necessary to evaluate how well each combatant command is able to support the strategy and how important that support is to the strategy's success. We evaluate the generating force at this level as well because the generating force's health is important to the entire strategy, not just to individual combatant commands. Moreover, it is difficult to attribute increments of generating force support to particular combatant commands in any simple, straightforward manner. *The most important analytic decision the analyst makes is to weight combatant commands' relative importance under each strategy.**
- *At Level 3, analysts assess how well each investment option supports the requirements of each combatant command and the generating force in each alternative security environment. This assessment provides the foundation for the assessments at Levels 1 and 2. It is the level at which the analyst or decisionmaker renders a judgment about how well alternative Army force structures meet each combatant commander's needs in each alternative security environment. This level of assessment also includes evaluating how well the resources allocated to generating force core capabilities match requirements in in a particular security environment.*

We will describe the analytical process used at each level, working from the bottom up. We will not subject the reader to the tedium of explaining the rationale behind each of over 200 separate assessments required by our notional cases. We will, however, explain the logic used and provide concrete examples.⁵⁴

⁵⁴ To be absolutely clear, these examples are all notional. Had we actually assessed each case against real ISCs, based on current MSFDDs, the results would be classified.

Level 3: Assessing How Well Army Investment Options Support the Requirements of Combatant Commands and the Generating Force Under Alternative Security Environments

An evaluation of how well available Army forces support each individual combatant command under each alternative strategy underpins the entire analysis. This requires analysts and decisionmakers to apply their professional judgment systematically. We will explain this process in the following paragraphs using two examples. PAT records these assessments and applies them systematically, but the assessments themselves are what are important.

First, let us consider to what degree the various alternatives' investment options meet combatant commands' requirements for forces under alternative strategies. We make these assessments based on three criteria:

- **Size of Combat Forces.** To what degree does the proposed investment option provide the required amount of combat forces (BCTs, Combat Aviation Brigades)?
- **Type of Combat Forces.** How well organized, trained, and equipped for this environment are the available forces?
- **Size of Support Forces.** Here we assume that the way support forces perform their function does not differ significantly in different security environments. Therefore, only the amount of such forces affects our assessment.

Obviously, the Direct COIN force incurs relatively low risk in the Direct COIN environment, reflected in the assessments in its row in Figure 5.2. The "Direct COIN" top row of the chart indicates that the options are being assessed against the demands of the Direct COIN strategy and its associated security environment. The term "ARCENT" in the next line down indicates that what is being assessed is the degree to which the investment option meets ARCENT's needs, ARCENT (U.S. Army Central) being the U.S. Central Command's (CENTCOM's) Army service component command (ASCC).

Below that, each row of the chart aligns with a particular investment option (e.g., "Direct COIN," "Build Local Defend Global," etc.), while each column aligns with an environment. Figure 5.2 depicts the Level 3 assessment of how well the Army force structure associated with each strategy meet ARCENT's (Level 2 Measure) requirements for forces under the Direct COIN strategy (Level 1 Measure). Focusing on ARCENT, we note that it loses eight BCTs and significant enablers under the Build Local Defend Global alternative. (See Appendix B, "Allocation of Forces by Combatant Command under Alternative Strategies" for detailed allocation to combatant commands in each investment option.) That still leaves CENTCOM with almost three quarters of its original force level, a decrease that would only increase the risk moderately, an assessment

Figure 5.2: Assessing ARCENT Risk Under Alternative Investment Options in the Direct COIN Security Environment

Level 1 Measure	Direct COIN					
Level 2 Measure	ARCENT					
Scoring Method	Thresholds					
Level 3 Measure	Size of Combat Forces	Type of Combat Forces	Size of Supporting Forces			
Investment Options	ARCENT Score				L2 Score (0, 0, 1, 1)*	
Direct COIN	0.90	0.90	0.90	0.90	0.9	
Build Local Defend Global	0.70	0.90	0.70	0.77	0.77	
Rising Peer	0.50	0.50	0.50	0.50	0.5	

reflected in the light green color. The Rising Peer force structure also takes eight BCTs and enablers from CENTCOM for use elsewhere. Moreover, the Army’s training focus under the Rising Peer shifts back to traditional combat, making those forces that remain less well prepared to conduct counterinsurgency. A yellow cell reflects this assessment. The analyst would perform similar assessments for the other two alternative strategies.

Next, we demonstrate an approach to assessing how well the generating force included in each investment option supports a particular strategy. In this particular approach, we compared the generating force resources available in each investment option with the requirements for each strategy. We considered not just the overall amount but also the resource allocation among five generating force core capabilities:⁵⁵

- Direct and resource the force.
- Develop human capital.
- Develop organizational and materiel capabilities.
- Prepare and project the force.

⁵⁵ DA PAM 100-1, *Force XXI Institutional Army Redesign*, Washington, D.C.: Headquarters, Department of the Army, 1998, identifies four core capabilities.

- Direct and resource the force
- Develop the force
- Generate and project the force
- Sustain the force.

We modified this taxonomy by splitting “Develop the force” into “Develop human capital” and “develop organizational and materiel capabilities” because of the conceptual difference between these two activities and the fact that both are mostly funded from distinctly different resource streams.

- Sustain the force strategically.

To calculate the aggregate resources devoted to each core capability, we aggregated projected costs for the SAGs and appropriations aligned with generating force functions, as reflected in Table 5.1. Table 5.1 groups budget activities and SAGs by generating force core capability. We can thus estimate generating force costs under alternative strategies by modeling how these generating costs have varied over time with changes in strategy, the security environment, and the operational Army.

It would be possible for the Army to have allocated the generating force adequate fiscal resources in the aggregate, for example, yet to misallocate them with regard to particular core capabilities. For instance, allocating too much to materiel development at the expense of training would be a mistake under the Build Local Defend Global strategy. This taxonomy, or a similar one, allows analysts to make that assessment.

Figure 5.3 depicts generating force costs under each strategy. The blue column indicates the level of resources required over 20 years to support the Direct COIN strategy, with the red column indicating the resources available under the Build Local Defend Global strategy. The green column depicts our estimate of resources required under the Rising Peer scenario.

Informed by this analysis, we formed our judgments about how much risk the generating force described in each investment option incurred in the future assumed by the Direct COIN strategy. Figure 5.4 records that assessment. In this case, we are assessing how well the resource allocation to the generating force under each strategy compares with the Direct COIN strategy's (Level 1 measure) resource requirements. Obviously, the generating force designed for the Direct COIN environment will be low-risk in that environment. Alternative generating forces incur more risk in this environment. For example, because both the Build Local Defend Global and Rising Peer strategies envision having less than half the resources needed to sustain strategically under the Direct COIN strategy, the Army's ability to sustain strategically under the two former strategies is at substantial risk, a judgment reflected in Figure 5.4. The only reason we do not consider those strategies to be liable to failure in this analysis is that we consider it unlikely in the extreme that the Army would not adjust as conflict drove costs upward.

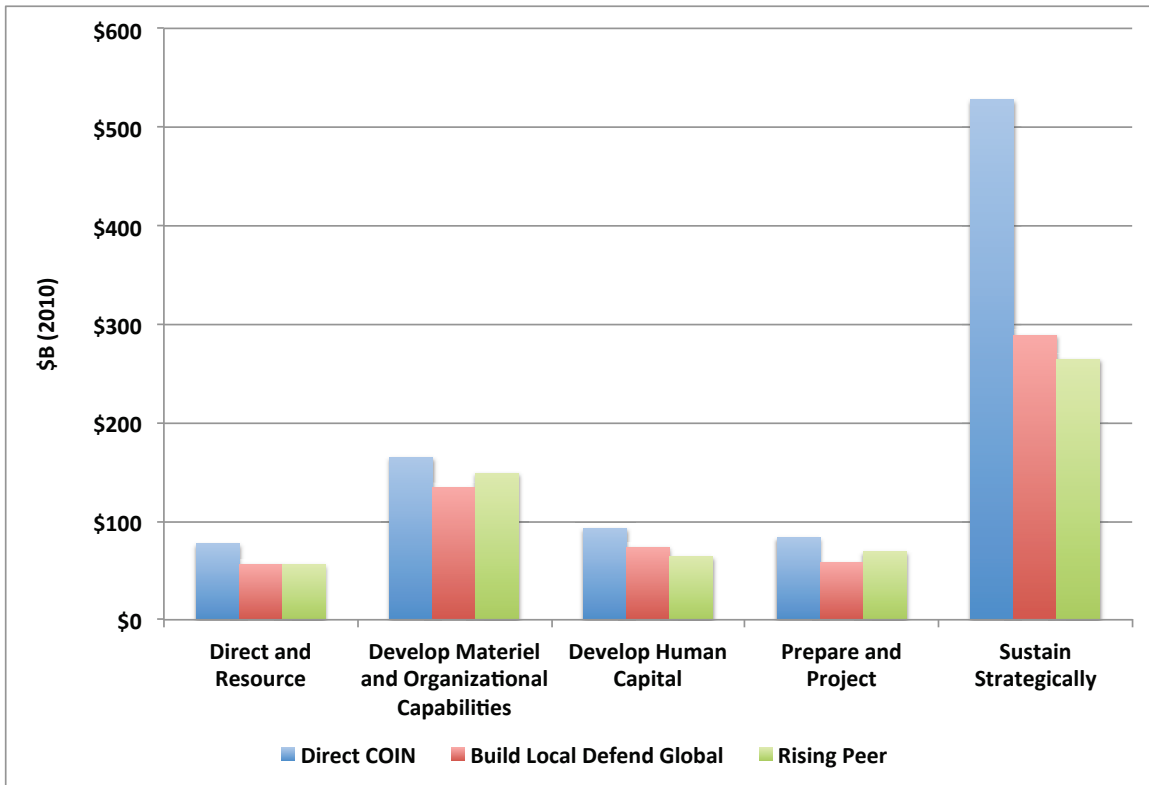
Clearly, each individual assessment relies heavily on the analyst's judgment. Analysts can use different frameworks and tools for forming their assessments. The important thing is that they apply them consistently. PAT helps ensure that consistency.

Table 5.1: Alignment Between Generating Force Core Capabilities and the Army Budget

Core Capability	SAG/Appropriation
<p>Direct and Resource the Force</p>	<ul style="list-style-type: none"> • Management and Operational HQs • Security Programs • Administration • Service-Wide Communications • Manpower Management • OMNG-Land Forces Systems Readiness • OMNG-Management and Operational HQs • OMNG-Staff Management • OMNG-Information Management/Service-wide communications • OMNG-Manpower Management • OMAR-Land Forces System Readiness • OMAR-Administration • OMAR-Service-wide Communications
<p>Develop Organizational and Materiel Capabilities</p>	<ul style="list-style-type: none"> • Land Forces Systems Readiness • Specialized Skill Training • Training Support • Support of NATO Operations (Formerly International HQs) • Land Forces Operations Support • RDTE
<p>Develop Human Capital</p>	<ul style="list-style-type: none"> • Officer Acquisition • Recruit Training • One Station Unit Training • ROTC • Flight Training • Professional Development Education • Recruitment and Advertising • Examining • Off Duty/Voluntary Education • Civilian Education and Training • Junior ROTC • Miscellaneous Support of Other Nations • OMNG-Other Personnel Support • OMAR-Other Personnel Support
<p>Prepare and Project the Force</p>	<ul style="list-style-type: none"> • Land Forces Operations Support • Force Readiness Operations Support • Strategic Mobility • Army Prepositioned Stocks • Industrial Preparedness • Force Readiness Operations Support • OMNG-Base Operations • OMNG-Facilities Sustainment, Restoration and Modernization • OMAR-Forces Readiness Operations Support • OMAR - Land Forces Operations Support • OMAR -Base Operations • OMAR-Facilities Sustainment, Restoration and Modernization
<p>Sustain the Force Strategically</p>	<ul style="list-style-type: none"> • Base Support • SRM • Depot Maintenance • Reset • Service-Wide Transportation • Central Supply Activities • Logistic Support Activities • Ammunition Management

Core Capability	SAG/Appropriation
	<ul style="list-style-type: none"> • Other Service Support • Army Claims Activities • Real Estate Management • OMNG-Land Forces Depot Maintenance • OMNG-Service-Wide Transportation • OMNG-Land Forces Depot Maintenance • OMNG-SRM • Servicewide Transportation • Army Working Capital Fund • MCA • Army Family Housing • MILCON ARNG • MILCON USAR

Figure 5.3: Generating Force Resource Requirements Under Alternative Strategies



Source: RAND analysis.

Figure 5.4: Assessing Generating Force Risk Under Alternative Investment Options in the Direct COIN Strategy

Level 1 Measure	Direct COIN								
Level 2 Measure	Generating Force								
Scoring Method	Thresholds								
Level 3 Measure	Direct and Resource	Develop Materiel and Organizational Capabilities	Develop Human Capital	Prepare and Project	Sustain Strategically				
Investment Options						Generating Force Score		L2 Score (0, 0.1, 1)*	
Direct COIN	0.90	0.90	0.90	0.90	0.90	0.90		0.9	
Build Local Defend Global	0.50	0.50	0.70	0.50	0.30	0.50		0.5	
Rising Peer	0.50	0.70	0.50	0.70	0.30	0.54		0.54	

Source: RAND analysis.

Level 2: Assessing How Well Combatant Commands and the Generating Force Are Able to Meet the Challenges of Alternative Security Environments

PAT aggregates these assessments of how well alternative investment options support each combatant command (through its assigned ASCC) and the generating force in each alternative security environment into the Level 2 Assessment. Figure 5.5 depicts how that works. The Level 3 assessment of how well investment options meet the needs of combatant commands and the generating force serves as the basis for the Level 2 assessment. Analysts must then determine how important each command and the generating force is under each alternative security environment.

Compared with the Level 3 assessments, assessing the relative importance of combatant commands and the generating force to each strategy is relatively simple. It is also profoundly important. The Level 3 assessment described above determines how well various investment options support the different combatant commands under each strategy. The Level 2 assessments of combatant commands’ relative importance determines whether and how much that support matters.

The only limitation PAT imposes is that the weight for each combatant command and the generating force must be a number between zero and one. It is up to the analyst or decisionmaker to determine what those numbers are. Table 5.2 reflects the view of the relative importance of various ASCCs and the generating force to the Direct COIN strategy. Each cell records how important the entity in a particular row is relative to the entity in the particular column. The assessment depicted in Table 5.2 is essentially arbitrary. It is not the only viable approach to weighting. What is important is that analysts make a conscious decision about relative importance.

Figure 5.5: Relationship Between PAT Level 3 and Level 2 Assessments

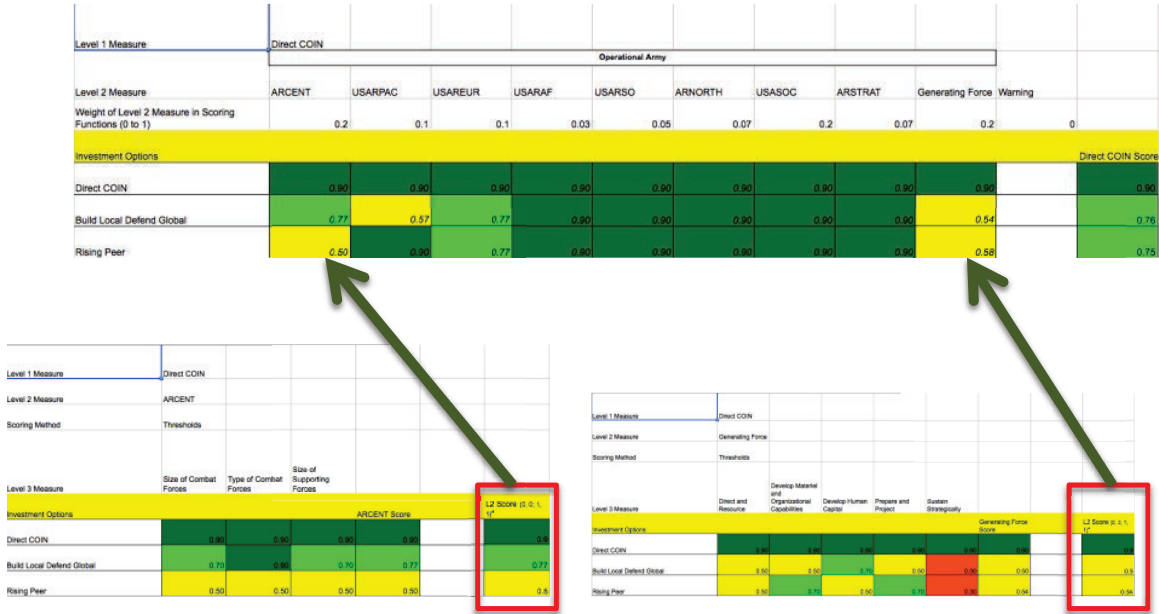


Table 5.2: ASCCs' Importance Relative to One Another Under the Direct COIN Strategy

	ARCENT	USAREUR	USARPAC	USARSO	USASOC	ARSTRAT	ARNORTH	Generating Force
ARCENT	1	2	2	4	1	3	3	1
USAREUR	1/2	1	1	2	1/2	3/2	3/2	1/2
USARPAC	1/2	1	1	4/3	1/2	3/2	3/2	1/2
USARSO	1/4	1/2	1/2	1	1/4	3/4	3/4	1/4
USASOC	1	2	2	4	1	3	3	1
ARSTRAT	1/3	2/3	2/3	4/3	1/3	1	1	1/3
ARNORTH	1/3	2/3	2/3	4/3	1/3	1	1	1/3
Generating Force	1	2	2	4	1	3	3	1

Source: RAND analysis.

The scores at PAT's summary level cover a lot of ground. PAT's drill-down function can reveal why these top-level scores came out as shown. The user can see the measures and scores at Level 2 that lead to the aggregate scores at the summary level for a given measure (that is, a given security environment).

Level 1: Assessing How Well Each Investment Option Meets the Demands of the Alternative Security Environments for Which Alternative Strategies Were Developed

PAT’s Level 1 or summary view provides analysts with the opportunity to assess investment options’ robustness. Figure 5.6 depicts that summary assessment. Not surprisingly, the Direct COIN Army is the most robust. It is also the largest and most expensive Army. Even though it lacks some of the high technology capability of the Rising Peer Army, it still has plenty of mass and firepower with which to deter or fight any wars that might develop. Developing robust options under resource constraints is both more important and more challenging.

Figure 5.6: Summary Assessment of Alternative Investment Options Under Alternative Future Security Environments

	Measures	Direct COIN	Build Local Defend Global	Rising Peer
Investment Options		Detail	Detail	Detail
Direct COIN		Dark Green	Light Green	Dark Green
Build Local Defend Global		Light Green	Dark Green	Light Green
Rising Peer		Light Green	Light Green	Dark Green

Source: RAND analysis.

This analysis also highlights the impact of using combatant commands as the unit of analysis. For example, one would suppose that an Army whose primary focus is advising and assisting foreign forces, the Build Local Defend Global army, would be at high risk in a future dominated by the prospect of high-technology conflict. The Build Local Defend Global Army has far fewer heavy brigades and a conservative approach to combat developments and modernization. Yet it has enough capacity for high-intensity conflict in the PACOM area of operations to meet the probable threat, even if its level of capability is at moderate risk. It has adequate capability and capacity to meet challenges throughout the rest of the world. Using combatant commands as the unit of analysis

provides a useful reminder that the characteristic problems that dominate discussions of strategy and force structure are not the only challenges for which the Army must develop capabilities.

Of course, this assessment does not conclude the issue. Decisionmakers must still consider how probable they believe the alternative security environments to be. For example, if the decisionmaker does believe that the world does not work as envisioned in the Direct COIN strategy, the fact that the Build Local Defend Global or Rising Peer options performs less well will not particularly matter. That decisionmaker could take comfort in the assessment that the aggregate risk of selecting the Build Local Defend Global option for a Direct COIN future is still low.⁵⁶

Summary and Conclusion

This chapter has illustrated a particular approach to assessing investment options' prospective effectiveness using RAND's Portfolio Analysis Tool (PAT). That approach aligns with the overall method described in this report. Because combatant commands are considered to be the agents of strategy, we assess how well alternative Army investment options associated with each strategy provide the forces and capabilities that combatant commands need under alternative strategies. Because alternative strategies depend to differing degrees on different combatant commands, this approach allows the analyst or decisionmaker to weight them differently.

The resulting assessments highlight the consequences of these assumptions. They provide the basis for further analysis and refinement of investment options. PAT is designed to illuminate issues for the decisionmaker, not make decisions for him. When properly structured, PAT's system of nested scores allows decisionmakers to quickly review assessments, drill down on those assessments that are not obvious and put them on the table for further discussion and analysis. Analysts and decisionmakers can and should iterate in order to develop more robust options under constrained resources.

As noted, the approach described in this chapter is one way of assessing alternative investment options and the strategies they support. It is not the only way. Users can employ different assessment taxonomies, perhaps organizing them by categories of scenario instead of by combatant command. It is critical to assess investment options putative effectiveness in some manner, even if the analyst is mostly concerned with deriving costs. Only a reasonably effective and relatively robust investment option can serve as a realistic basis for assessing costs implied by changes in defense strategy.

⁵⁶ That assessment is not unreasonable. The Build Local Defend Global Army is somewhat larger than the Army with which the U.S. began OEF and OIF. Although that Army had to change, it was able to do so in time to bring OIF to a relatively successful conclusion.

6. Summary and Conclusions: Responsive Analysis to Inform Initial Strategic Guidance

The Army Capabilities Integration Center asked the Arroyo Center to develop a method for predicting the cost implications for the Army of changes in defense strategy. ARCIC was particularly interested in identifying strategic variables that drive costs for both the operational Army and the generating force. The purpose of the resulting method, the Strategic Investment Analysis Protocol (SIAP), is to develop first-order estimates of the costs and effectiveness of different strategies and different investment options in order to allow Army senior leaders to develop resource-informed strategic guidance and recommendations.

There is considerable scope for further research in this vein, however. Risk analysis and portfolio management depend on reliable estimates of the probability and consequence of certain contingent events, like a change in asset prices. Neither type of estimate is readily available to support the management of the Army's portfolio of capabilities. While the Army probably will never be able to quantify the probabilities of conflict precisely, it would help to think about them systematically. It would be especially useful to explore the degree to which preventive engagement might or might not mitigate the risks of larger conflicts. Better research is needed with regard to the costs of such conflicts as well. Finally, although we believe our approach to estimating generating force costs stands on solid ground, the models themselves probably require further requirement.

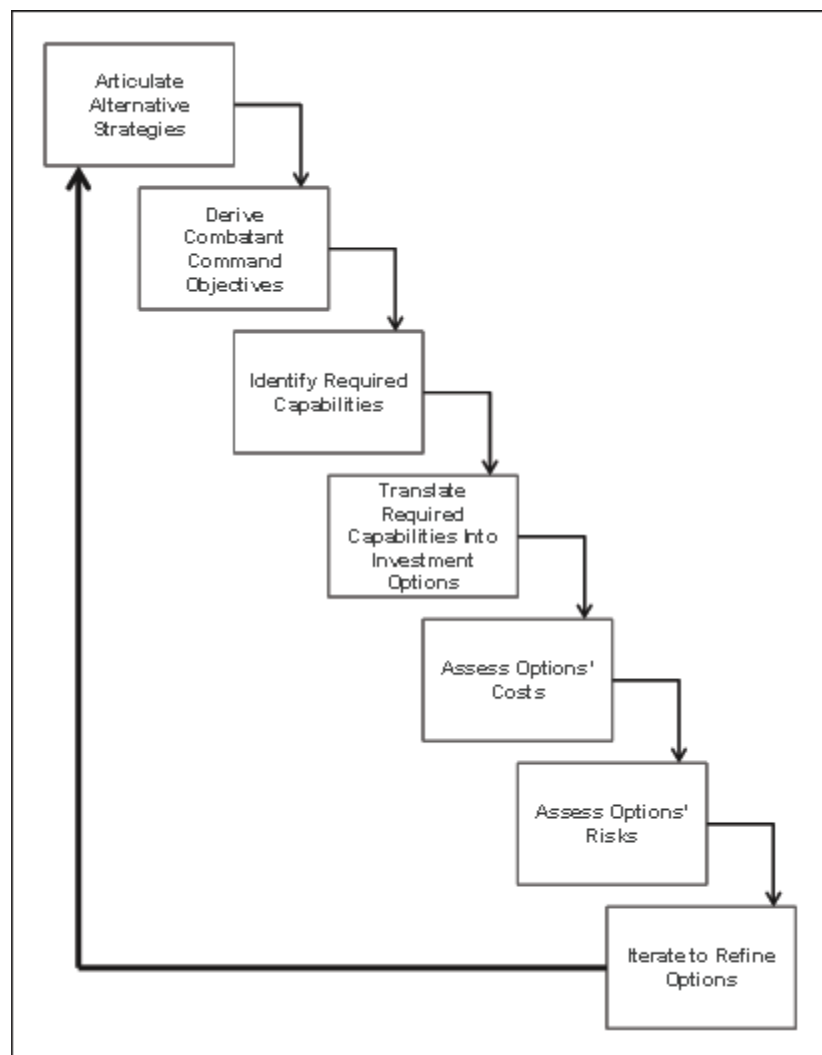
The Problem: Developing Timely Estimates

Existing planning, programming and budgeting system (PPBS) processes provide precise, accurate estimates of the resources required to implement the National Defense Strategy. The problem is that those estimates arrive months after the strategy has been adopted and the Department of Defense is already committed to it. To invert and paraphrase a popular aphorism, the wheels of PPBS grind exceedingly small, but they grind very slowly. Once Defense Department leaders adopt a particular strategy, they have, in effect, determined the sort of Army they will require. The only question remaining for them is the degree of risk they are willing to accept with regard to that Army. Therefore, decisionmakers need a means of comparing alternative strategies' costs and risks before they make that decision.

Approach

The approach developed for this study amplifies and extends earlier RAND work recorded in our 2008 reports *Developing Resource-Informed Strategic Assessments and Recommendations* and *Analysis of Strategy and Strategies of Analysis*.⁵⁷ That work laid out the seven-step process depicted in Figure 6.1. This report focuses on the last step of the process, estimating the costs implied by an alternative defense strategy. For this study, we focused on the Army context.

Figure 6.1: RAND Approach for Relating Resources to Strategy: The Strategic Investment Analysis Protocol (SIAP)



⁵⁷ Davis et al., 2008; Gompert et al., 2008.

Conclusions

The most important result of this study is that it is possible to develop relatively accurate, first-order estimates of alternative defense strategies' cost implications for the Army. Such estimates can inform the development and selection of defense strategies, and the Army investment options that support those strategies. We are confident that the method proposed in this report, the Strategic Investment Analysis Protocol (SIAP), provides a reliable method for doing so.

SIAP requires relatively little manpower to implement, at least relative to the PPBS processes that it mimics. It thus allows a small team of analysts to provide responsive, confidential analysis to decisionmakers during the critical, early phases of the decision process. Service planners may envision improvements to this method, or even entirely different approaches to the same problem. Regardless of the method employed, the important thing is to integrate this kind of strategic analysis at an early stage, so that officials no longer have to commit to a particular strategy on the basis of very limited information about its potential resource implications.

Existing Methods for Estimating Operational Army Costs Remain Useful

Techniques to estimate operational Army costs are well developed. Operational Army costs include operations and maintenance costs associated with operational Army units, along with associated military personnel and procurement costs. Once analysts determine the number and type of forces required, the Army has mature tools for assessing those forces' operations and support costs. For our analysis, we relied heavily on one such tool, the Office of the Assistant Secretary of Army for Financial Management and Comptroller's (OASA (FM&C)'s) Force and Organization Cost Estimating System (FORCES).⁵⁸ The FORCES Cost Model estimates required operations and support requirements for operational Army units. In particular, we used FORCES' estimates of alternative armies' Direct Equipment, Parts and Fuel (DEFL) and Indirect Support costs.

In combination, those two cost elements equate to operations and maintenance requirements for operational Army units. FORCES' estimates of the resources required to pay associated military personnel and to replace the capital inventory associated with an alternative force structure were also important to our analysis. Aside from demonstrating their utility in this kind of analysis, we have little to add.

⁵⁸ OASA (FM&C) graciously provided the data directly to the study team for our investigation.

The Army Budget's Structure Provides the Basis for Estimating Generating Force Costs

To the extent this study breaks new ground, it does so with respect to estimating generating force costs. Most of the Army's budget records costs required to organize, man, train and equip those forces. Those functions, and thus those costs, are the province of the Army's generating force. The budget's different appropriations and sub-activity groups (SAGs) more or less align with generating force core processes and core capabilities as described by DA PAM 100-1, *Force XXI Institutional Army Redesign*. In order to understand how those costs might vary under alternative strategies, we examined how the different SAGs and appropriations have responded to past changes in strategy and conditions.

Seven Categories of Factors Affect Generating Force Costs

Through that analysis described above the research team was able to identify a limited set of factors that seemed to govern generating force costs. Those factors fall into the seven broad categories identified in Table 6.1.

Table 6.1: Variables Affecting Army Generating Force Resource Requirements

Category	Variables
Operational commitment	<ul style="list-style-type: none"> • Brigade combat teams (BCTs) deployed • Reserve component soldiers mobilized • Cyclic readiness in effect (Y/N)
Army size	<ul style="list-style-type: none"> • Components' endstrength • Average on active duty strength
Modernization	<ul style="list-style-type: none"> • Average annual procurement
Operational environments' diversity and complexity	<ul style="list-style-type: none"> • High: large number of different culturally and linguistically complex operational environments • Medium: relatively few different culturally and linguistically complex operational environments, along the lines of OIF/OEF • Low: Operational environments present few cultural or linguistic challenges, either due to environments' familiarity or the nature of operations
Operational intensity	<ul style="list-style-type: none"> • Average annual casualties anticipated
Combat developments emphasis	<ul style="list-style-type: none"> • Deliberate: long-term effort to establish disruptive advantage in the future security environment • Accelerated: short-term efforts focused on adapting to operational environments to which Army forces are already committed
Strategic responsiveness required	<ul style="list-style-type: none"> • High: The Army must be able to achieve operational overmatch in distant theaters with little advance notice • Low: The Army can anticipate having ample time to prepare and project forces in response to emerging crises

Source: RAND analysis.

We then developed models incorporating those variables to estimate generating force costs by SAG or, where possible, by appropriation. That analysis involved an extensive review of the documentary evidence presented in Army budget justification documents and statistical analysis correlating SAG execution with changes in the variables identified above, as well as other potential variables. The documentary evidence was particularly important because it provided the specific rationale for specific variations in costs. This evidence indicated what kinds of variables might drive requirements for each SAG, informing our quantitative analysis. When our quantitative analysis of requirements within a SAG was both consistent with this qualitative analysis and did not appear to be statistically invalid, we adopted the resulting multivariate regression model. When the statistical analysis was ambiguous or contradicted by the documentary evidence, we built our model based on the latter.

This mitigates the risk of error. Other analysts with more accurate and comprehensive data might arrive at slightly different models. Indeed, we strongly recommend such refinement. We are confident in our basic approach, which involves analysis at the individual SAG level. At a minimum, the resulting set of models confines the range of each SAG's potential requirements to its historical range, and indicates the direction of change.

We caution against refining models too much, however. If these models and this approach are to be useful to senior leader decisionmaking, they should not require senior leaders to make assumptions about matters with which they may be unfamiliar. For example, we feel confident that senior leaders would feel comfortable making assumptions about the number of BCTs required by some future conflict or a reasonable size for a future Army. We are less confident that they would be comfortable making assumptions about the future size of the Army's civilian workforce.

Assessing Investment Options' Robustness is a Prudent Risk Mitigation Step

Finally, assessing strategies' potential effectiveness and that of their associated investment options is a critical component of SIAP. The fact that analysts develop a particular force structure and generating force resource allocation to support a particular strategy is no guarantee that it actually does so. In the Interwar Period, the French army meticulously designed itself to defend France against a German onslaught. It failed spectacularly. So it is necessary to assess the capabilities and capacity of a given option against the requirements of the strategy for which it was designed. The Multi-Service Force Deployment Documents (MSFDDs) of OSD's Analytic Agenda, integrated into integrated security constructs aligned with each alternative strategy, comprise the tool for making such assessments. Our illustrative analyses elide this assessment, because the MSFDDs are classified, but Army analysts should not similarly ignore them. Equally, if not more important, analysts should also assess alternative strategies against the

requirements of other alternative futures, to hedge against the risk that the assumptions underpinning a particular strategy turn out to be wrong. Indeed, according to former Secretary of Defense Robert Gates, such assumptions will inevitably be wrong.

Analysts should use the results of these assessments to refine investment options and iterate the analysis. Prudent Army analysts and decisionmakers seek to develop an Army that is “least badly wrong” across a range of potential strategies and future security environments. Such options are robust against potential shocks.

For Further Research: Improving Strategic Risk Analysis

This study resulted in a method that allows senior Army leaders to develop consistent, first-order estimates of the relative costs implied by alternate defense strategies. Those estimates include costs for the generating force as well as the operational Army. It also allows the Army to evaluate how robust alternative Army force structures (including the generating force) are across alternative futures. Army leaders can use this method to inform high-level deliberations on national strategy, and as a basis for providing initial guidance to the Army on resource allocation in support of changes in strategy.

More remains to be done, however. Significant revisions to the defense strategy occur infrequently, and the Army makes few decisions about strategy anyway. More usually, Army leaders must decide how to allocate constrained resources among competing and unlike investments. Should it acquire new unmanned surveillance systems, or fund a barracks upgrade? Does it need more maneuver units, or should it augment existing formations’ capabilities? The answers must persuade important internal and external stakeholders, so the logic must be both simple and transparent. In short, the Army needs to be able to assess how changes in Army capabilities and capacity increase or reduce risk in a way that is persuasive to internal and external stakeholders alike.

Standard risk assessment techniques involve computing an expected value, in which the likelihood of an event is multiplied by its consequence. Such techniques require authoritative estimates of both probability and consequence, such as the frequency of flooding or analysts’ prediction of the return on a particular investment. Such authoritative estimates of the likelihood and consequence of conflict have yet to be developed, however. RAND research in the 1990s proposed an approach to that problem, but neither DoD nor any other organization appear to have implemented that approach on a significant scale.⁵⁹ The analytic approach presented in this report can highlight assumptions about risk, but rigorous comparison of force management and modernization

⁵⁹ See, for example, Tim Bonds, Glenn A. Kent, Colin Lampard, Randall Bowditch, John Birkler, Monti D. Callero, and James Chiesa, *A Tool for Evaluating Force Modernization Options*, Santa Monica, Calif.: RAND Corporation, MR-905-OSD, 1998.

decisions requires systematic assessments of about the probability and consequence of possible outcomes.

Estimating the Conditional Probability of Conflict

A particular question that emerged during this study concerned how to assess relative costs associated with the likelihood of conflict. Of the three notional strategies explored in this report, the Direct COIN proved most expensive by far because it presumed a high level of persistent conflict. Such assumptions were consistent with Army planning throughout much of the last decade. On the other hand, it seems highly unrealistic to simply assume that the United States would be able to avoid conflict almost entirely under the alternatives proposed, however. Moreover, proponents of strategies like the Direct COIN strategy would argue that alternatives court more-severe risks by failing to acknowledge the inevitability of conflict. Certainly, the risk of conflict under a particular strategy is a legitimate decision criterion, but tools to quantify that risk, or even to bound it, do not exist.

In this vein, the Departments of Defense and Army also need to better understand and articulate how potential interventions affect the likelihood and consequence of various contingencies. The 2010 *Quadrennial Defense Review Report* and the 2010 *Defense Strategic Guidance* hypothesize that preventive engagement can decrease the risk of conflict. While that hypothesis seems plausible, there is little evidence in the public record to either confirm or contradict that hypothesis. More importantly, even if true, we know little about the degree to which engagement can reduce the risk of larger conflicts. As the Army faces difficult decisions about the degree it should trade capacity for waging wars for capabilities and capacity to prevent them, it becomes even more important to understand this dynamic.

Estimating the Extraordinary Cost of Operations

To compare the costs of preventing wars against the costs of waging them, it is necessary to estimate the costs to the Army of the various operations to which Army forces might be committed. Neither the Department of Defense's Analytic Agenda nor Total Army Analysis appear to include such cost estimates, however. There are two basic approaches to estimating potential contingency operations' costs.

In the first, analysts can aggregate unit cost estimates developed with the Army Contingency Operations Cost Model (ACM). The ACM is part of the FORCES suite. It allows analysts to estimate the costs to deploy and employ a given force package to a specified operational environment. Essentially, it aggregates individual estimates of the costs to deploy and employ particular unit types to specified operational environments.⁶⁰

⁶⁰ DASA-CE, "FORCES Information."

Analysts can use the force tables and timelines provided with each MSFDD as inputs to the ACM, resulting in an aggregate cost estimate.

The problem with that approach is that a contingency operation's cost may well differ from the sum of its parts. Our own rudimentary analysis of the extraordinary costs of operations in OIF and OEF indicates that certain operational themes—in these cases, counterinsurgency—impose certain patterns of operational costs. In the related field of casualty estimation, George W.S. Kuhn of the Logistics Management Institute found that aggregating casualty estimates for individual units was likely to overestimate the aggregate total. Based on an extensive review of historical casualty data, Kuhn determined that this approach failed to account for differences in units' operational circumstances over the course of an extended campaign.⁶¹

Ergo, we suggest that Army analysts also seek to estimate operations' costs by extrapolating from historical examples. In addition to OIF and OEF, the recent record includes major combat operations during Operation Desert Storm, stability operations in the Balkans, occasional non-combatant evacuation operations and fairly frequent humanitarian relief efforts. Obviously, the historical record does not mirror the defense planning scenarios comprising the Analytic Agenda. Several well-researched, paradigmatic cases could help analysts identify factors that affect operations' costs, as opposed to the costs of units committed to operations.

Ideally, both approaches would be employed and their results compared and reconciled. For each planning scenario, the Army would have an estimate of both the forces and costs required to accomplish its mission. Such cost estimates would enable Army analysts to assess the expected value of alternative defense strategies' extraordinary costs of operations. In particular, analysts could explore the cost implications of relying more heavily on a strategy of preventive engagement to avert the need for large-scale commitment.

Generating Force Cost Modeling

This study demonstrated how analysts can estimate generating force costs incident to a change in defense strategy at a fairly high level of aggregation. While the study's approach to estimating generating force costs is generally sound, the specific models we developed remain rudimentary. The fiscal data and documents on which they are based cover on a limited span of time, from FY1995–2010. That time frame includes only a relatively narrow range of strategic circumstances. Protracted, large-scale

⁶¹ George W.S. Kuhn, *Ground Forces Battle Casualty Rate Patterns: Current Rate Projections Compared to the Empirical Evidence*, McLean, Va.: Logistics Management Institute, 1990, p. vii; *Ground Forces Battle Casualty Rate Patterns: Uses in Casualty Estimation and Simulation Evaluation*, McLean, Va.: Logistics Management Institute, 1992, p. 4–9. Kuhn's approach to casualty estimation might well serve as a model for projecting operations' costs.

counterinsurgency operations consumed most of the last decade. Before then, the late 1990s included only a limited degree of operational commitment. Throughout this period, the U.S. has not faced the threat of any serious peer or near-peer competitor. The FY1995–2010 period does not even include the first Gulf War, which represents an entirely different type of contingency operation from those in the period under consideration.

Analysts should therefore expand the timeframe under consideration to encompass a wider variety of strategic conditions. Moving forward, it will become clearer how the more proactive strategy of engagement described in U.S. declaratory policy affects generating force costs. It would of course be useful to be able to model how generating force costs varied in response to the first Gulf War. It is also important to integrate the late Cold War buildup into the analysis, since the 1995–2010 period does not include a comparable peacetime military modernization effort.

While refining these models, however, researchers should remain focused on their purpose: to provide senior leaders with discreet, responsive, first-order estimates of how aggregate generating force costs might vary in response to changes in strategy. For example, the Army staff can already model how base operations costs should vary with the number of personnel assigned to each different installation. That level of analysis is essential to developing the Army budget and program, but it takes data unlikely to be readily available to senior Army leaders and their immediate staff. Obtaining such data and estimates would require considerable time, as well. We posit that a rough estimate based on aggregate endstrength is far more useful to senior Army leaders in preliminary deliberations over strategy. Such estimates can also provide a “yardstick” against which to compare the more precise analysis developed during the PPBES process.

Harnessing Senior Leaders’ Judgment

A 2009 Project AIR FORCE study, *Managing Risk in USAF Force Planning*,⁶² addresses many similar issues. That study’s method links familiar tools, including risk management, alternative futures, and the balanced scorecard to enable the Air Force to compare the relative strategic utility of various investment options. One of the study’s key conclusions was that, in order to be persuasive, a useful method had to harness senior leaders’ subjective judgments about risk at the strategic level. “Subjective” is often a pejorative adjective in analytical deliberations, but senior leaders have honed their intuition through decades of experience. Perhaps more importantly, there is little empirical basis on which to make objective assessments of the likelihood and magnitude of strategic risks. Capturing senior leaders’ beliefs about risks allows analysis and

⁶² Frank Camm, Lauren Caston, Alexander C. Hou, Forrest E. Morgan, Alan J. Vick, *Managing Risk in USAF Force Planning*, Santa Monica, Calif.: RAND Corporation, MG-827-AF, 2009.

deliberations to take place according to a common logic. The analyst's role in this process is to ensure the consistent application of subjective judgments about risk and utility across all investment options, across all futures. Adapted and refined for Army use, the method described in this report could address many of the key issues that complicate Army resource decisions.

Using SIAP to Support Army Planning

We developed SIAP to provide Department of Defense and Army leaders with the means to assess the costs and risks of alternative strategies before the Department commits itself to a specific alternative. In the normal course of strategy and program development, SIAP can inform the Army's evolution of its Army Strategic Planning Guidance (ASPG) and the Army Programming Guidance Memorandum. It could also enable senior leaders to provide more precise guidance with which to initiate the force management requirements process, which includes but is not limited to the Requirements phase of Total Army Analysis (TAA).

Changes in strategy honor normal PPBES processes in the breach as much as the observance, however. Examples of such major discontinuities include General Peter Schoomaker's initiation of the Army's modular Transformation, or adoption of the "surge" strategy in Iraq with the concomitant decision to grow the Army. In such cases, being able to assess alternatives' inherent costs and risks rapidly becomes even more important.

With this in mind, SIAP trades precision and accuracy for responsiveness. It cannot substitute for ordinary PPBS processes in providing the detailed and specific analysis of what it will actually take to implement a particular strategy. Instead, SIAP provides relatively accurate, first-order estimates of alternative strategies' costs and risks to help policymakers select and refine a strategy from among plausible options.

Appendix A: Alternative Strategies

This appendix describes how the research team derived the capabilities needed to support each alternative strategy from the strategic concept described in Chapter Two. It works through the method, step by step, beginning with a characterization of the current strategy and a statement of two alternative strategies that, while illustrative, relate well to issues of grand strategy that are being debated today. We draw these strategies from our earlier work at the joint level. Discussion of the strategies is deliberately abbreviated, since the focus of this report is on the methodology to determine the resource implications of different strategies, not developing the strategies themselves in detail. Those interested in a more detailed explanation of the strategies used in this report should review our earlier work, *Analysis of Strategy and Strategies of Analysis* (Gompert et al., 2008).

Articulating Alternative Strategies

This section describes the alternative illustrative strategies used for this analysis. Although the strategies are notional, they resemble either strategies in force (in the case of the Direct COIN strategy) or those being considered in the broader U.S. discourse over strategy. The three illustrative strategies are

- Direct COIN (analytic baseline)
- Build Local Defend Global
- Rising Peer.

Direct COIN (analytic baseline). Extremist Islamist insurgency is a worrisome phenomenon that threatens the homeland and important U.S. interests in such sensitive regions as

- energy-producing countries in the Gulf and North Africa
- countries straddling key lines of communication, such as Indonesia
- important Muslim-majority allies and partners such as Pakistan and Turkey
- Allied NATO countries such as the UK and France with alienated Muslim minorities

Islamist insurgencies can also threaten the state of Israel, to which the United States has long-standing security responsibilities.

This is a relatively new phenomenon, at least in its intensity and in its transnational character. While the United States and its allies have well-honed approaches to dealing with symmetric competitors, they are still feeling their way on how to cope with this largely new challenge. In turning to this strategy, decisionmakers have judged that it is

unlikely that local states will be able to deal with the challenges by themselves. As a result, *the United States should plan on continuing, direct intervention to assist in COIN operations.*

Build Local Defend Global. Although the concerns of the Direct COIN strategy are valid, eliminating insurgent threats through large-scale U.S. military operations has proven to require a very large investment in U.S. forces and to be extremely expensive with no assurance of ultimate success. Indeed, the presence of U.S. military forces conducting operations on the territory of other states risks creating strong backlash reactions as adversaries depict such operations as unwanted “occupation” of their lands and of a U.S.-led “war against Islam.” Hence, for a variety of reasons, *local instability is best dealt with by local forces, which implies a strategy of investing heavily to build and sustain local capacities.*⁶³

Rising Peer. Although the Islamist challenge is undeniable, as mentioned in the Current Direct COIN and Build Local Defend Global strategies, the preeminent challenge is the rise of potential adversaries like China. Chinese diplomatic, economic, technological and military power cannot help but alter the strategic landscape. Unless the United States takes proactive measures, this expansion could take place at the expense of U.S. interests. A strong U.S. stance, in the Pacific and globally, will lay the foundation for a stable, peaceful, long-term relationship with China (albeit one of competition). The Islamist challenge, although substantial, can probably be contained by supporting the efforts of local countries, and without greater investments than are already part of the current program. We should note that China serves as a proxy for any other large, technologically and economically advanced adversary. For these reasons, *the United States should prepare emphasize technology and materiel modernization to cope with an emerging peer competitor.*

Contrasting Goals, Approaches, and Preparations for Adaptation

Against a background of conflicting premises, the strategies have contrasting goals and approaches, as described in Table A.1. The differences between these strategies are stark. These stark differences between notional strategies are particularly useful for demonstrating the methods to derive costs from strategy developed in this study. A true national security strategy probably would include elements of all three of the strategies described.

⁶³ See two RAND reports for further development of the imperative for the United States to serve as an enabler of COIN operations in foreign countries, rather than be the principal actor: Andrew R. Hoehn, Adam Grissom, David Ochmanek, David A. Shlapak, Alan J. Vick, *A New Division of Labor: Meeting America's Security Challenges Beyond Iraq*, Santa Monica, Calif.: RAND Corporation, 2007; David C. Gompert, John Gordon, IV, Adam Grissom, David R. Frelinger, Seth G. Jones, Martin C. Libicki, Edward O'Connell, Brooke Stearns Lawson, Robert E. Hunter, *War by Other Means – Building Complete and Balanced Capabilities for Counterinsurgency*, Santa Monica, Calif.: RAND Corporation, 2008.

Table A.1: Characterizing the Alternative Strategies

Strategy	Goal	Approach to Core Goal
Direct COIN (analytic baseline)	Diminished threat from, capability of, and support for Islamist terrorist groups and associated insurgents acting against U.S. interests.	Direct U.S. intervention to defeat insurgent groups and stabilize fragile states from which terrorist groups are operating or could operate. Other facets include: <ul style="list-style-type: none"> • Direct action against high value targets (HVTs). • Efforts to improve indigenous security forces' capability and capacity. The need for military interventions is expected.
Build Local Defend Global	Diminished threat from terrorist and associated insurgent groups without the expense and risk of over commitment associated with direct interventions.	Assist indigenous security forces in partner countries to develop competence to handle non-state threats. Foster multi-lateral cooperation with capable allies and partners. Intervene directly only as necessary to: <ul style="list-style-type: none"> • Prevent a strategic shift in a vital region. • Defeat threats to free flow of goods or access to energy sources. • Protect an ally.
Rising Peer	Potential peer and near-peer competitors constructively engaged in international affairs, deterred from acts of military intimidation or coercion.	Deter and dissuade potential adversaries from pursuing a path of military confrontation with the United States. <ul style="list-style-type: none"> • Plan military capabilities to ensure that U.S. could prevail in plausible conflict against potential peer competitors. • Encourage military cooperation in areas of common interest such as counterterrorism and SLOC security.

We will present several tables throughout the rest of this appendix to document the logic chain that links strategic goals to shifts in Army forces. With the exception of Table A.1, we presume that the links between approaches and combatant command objectives, and from combatant command objectives to specific forces and programs, should be relatively intuitive. We do explain the rationale behind specific force shifts in the paragraphs detailing specific force shifts for each strategy. Those desiring a more detailed explanation of the links should consult our earlier work.

Combatant Command Objectives

The key to success of the strategy focused on Direct COIN is the capable performance of CENTCOM, although other combatant commands have key contributions to make. The strategy of Build Local Defend Global, although also focused on the Islamist threat, seeks to improve the capabilities of partner countries in several regions worldwide. The Rising Peer strategy is largely focused on the Pacific Command (PACOM). Table A.2 highlights representative objectives particularly relevant to the alternative strategies. As an example, under all strategies the United States must be able to intervene to protect oil supplies and deal with a North Korean attack of South Korea or an attempted Chinese coercion of Taiwan. The objectives indicated are meant to be

illustrative of both the similarities and differences between our notional strategies. They are not meant to be exhaustive.

Table A.2: Representative Combatant Command Objectives for Illustrative Strategies

Command	Direct COIN (baseline)	Build Local Defend Global	Rising Peer
CENTCOM	<ul style="list-style-type: none"> Promote stability of allied governments and prevent creation of terrorist havens Ensure access to and transit of energy supplies Contain and keep pressure on Iran Execute direct COIN operations Identify and strike terrorist targets Build up indigenous COIN capacity 	<ul style="list-style-type: none"> Build strong capability of indigenous security forces, both on shore and in coastal waters Provide direct military support for local allies as needed Enable actionable intelligence for limited strikes on terrorist targets and early warning of incipient crises Improve capacities of local governments 	<ul style="list-style-type: none"> Enhance SLOC security Build capability of indigenous security forces and governments
PACOM	<ul style="list-style-type: none"> Deter North Korean attack Deter Chinese attack on Taiwan Maintain SLOCs' security Prevent growth of terrorist capabilities Identify and strike terrorist targets Build up indigenous COIN capacity 	<ul style="list-style-type: none"> Build capability of indigenous security forces, both on shore and in coastal waters Enable actionable intelligence for limited strikes on terrorist targets and early warning of incipient crises Improve capacities of local governments 	<ul style="list-style-type: none"> Maintain capacity to establish sea control in the Western Pacific Enhance SLOC security Strengthen local alliances and partnerships and engage with China on issues of common interest Build capability of indigenous security forces and governments
EUCOM	<ul style="list-style-type: none"> Maintain a strong security partnership with European allies Enhance European focus on and capabilities for global counter-terrorism and COIN operations 	<ul style="list-style-type: none"> Improved capability to deploy forces out of area rapidly Increase contribution of allies to security in the Mediterranean and Atlantic 	<ul style="list-style-type: none"> Increase contribution of allies to security in the Mediterranean and Atlantic
AFRICOM	<ul style="list-style-type: none"> Improve indigenous security forces and promote good governance Conduct limited direct operations against terrorist targets Build up indigenous COIN capacity 	<ul style="list-style-type: none"> Build capability of indigenous security forces, both on shore and at sea Improve capacities of local governments Build up indigenous COIN capacity 	<ul style="list-style-type: none"> Promote political and economic progress independent of China Build maritime security capabilities of local allies and partners
SOUTHCOM	<ul style="list-style-type: none"> Promote stability of local governments and prevent creation of terrorist havens Improve regional allies' capabilities to conduct counter- insurgency and counter-drug operations 	<ul style="list-style-type: none"> Build capability of indigenous security forces, both on shore and at sea Improve capacities of local governments 	<ul style="list-style-type: none"> Build maritime security capabilities of local allies and partners

NORTHCOM	<ul style="list-style-type: none"> • Prevent terrorism against U.S. territory • Support civil authorities in counter-terrorism and disaster response 	<ul style="list-style-type: none"> • Prevent terrorism against U.S. territory • Support civil authorities in counter-terrorism and disaster response 	<ul style="list-style-type: none"> • Prevent terrorism against U.S. territory • Support civil authorities in counter-terrorism and disaster response
STRATCOM	<ul style="list-style-type: none"> • Provide assured global nuclear deterrent • Maintain current level of national missile defense • Provide national aerospace and cyberspace security 	<ul style="list-style-type: none"> • Provide assured global nuclear deterrent • Partially compensate for drawdown of forward deployed forces • Maintain current level of national missile defense 	<ul style="list-style-type: none"> • Enhance national missile defense • Enhance global ISR capabilities • Prepare to compensate for potential loss of space-based ISR and communications assets
SOCOM	<ul style="list-style-type: none"> • Support national level objectives where highly focused and/or covert action is needed • Integrate and synchronize U.S. military efforts to combat terrorism 	<ul style="list-style-type: none"> • Enhance support to combatant commands in training of indigenous forces and direct action • Integrate and synchronize U.S. military efforts to combat terrorism 	<ul style="list-style-type: none"> • Selectively employ direct action for limited periods in pursuit of HVTs • Integrate and synchronize U.S. military efforts to combat terrorism
JFCOM	<ul style="list-style-type: none"> • Deter support for terrorism • Deter rise of potential military competitors • Provide rapid global support to other combatant commands and to allies • Limit proliferation of WMDs and other advanced weapons technologies 	<ul style="list-style-type: none"> • Maintain capacity to surge forces forward in those cases where enhanced direct action capability is needed 	<ul style="list-style-type: none"> • Provide ground, air, and maritime surge capability to support potential high-intensity conflict with near-peer competitor

Identifying Capabilities Needed by Combatant Commands

When decisionmakers reflect on changing a course of action, or in this case, adopting a new defense strategy, they are typically interested in the change from the existing current program, asking such questions as the following:

“If we move forward with a more aggressive defense strategy, one that doesn’t depend strong contribution from allies, how much more will that cost?”

or

“If we pull back and let local forces take responsibility for their own security, how much could we save?”

In the remainder of this appendix, we first derive required capabilities from the objectives described in Table A.2. We then translate those capabilities into investment options comprised of forces and programs. (We explain how we estimate options’ costs and assess their risks in Chapters 3–5).

Combatant command objectives may in some cases indicate a clearly needed set of capabilities, but there can be more than one set of capabilities that can address a given objective. This is not new. Force planners routinely wrestle with precisely such an analytic challenge. This approach will not resolve that challenge, but it does provide a useful and transparent analytic framework: clearly stating capabilities that match the combatant command objectives, which in turn establish a foundation for identifying programs and force shifts to provide these capabilities. The resource implications of the strategy can then be expressed through the programs and force shifts in a way that links the costs and savings back to capabilities and so to objectives.

Following the flow of methodology discussed earlier, the next step is to characterize the capabilities needed by the combatant commands to achieve their objectives. Table A.3 describes these capabilities succinctly. The capabilities listed in these tables are not wholly comprehensive but are meant to suggest the essence of a more comprehensive list. The capabilities listed in Table A.3 emphasize differences from the current program particular to the strategy in question.

Table A.3: Representative Combatant Command Capability Requirements

Combatant Command	Direct COIN	Build Local Defend Global	Rising Peer
CENTCOM	<ul style="list-style-type: none"> • Sizable forces for COIN and stability operations in Iraq and Afghanistan • Training and advisory teams to build local COIN capacity with strong focus on Iraq and Afghanistan • SOF direct action capability • Forces to defeat a regional aggressor in a major theater war • Adequate naval forces to protect SLOC security • Robust security sector reform in Iraq and Afghanistan 	<ul style="list-style-type: none"> • Substantial increase in training and advisory teams to build local COIN capacity • Sufficient ground combat forces to deter regional competitors and to support allies if indigenous forces are overwhelmed • Enhanced naval presence to improve SLOC security and partner with local forces • Substantial financial assistance to upgrade local security forces, and security sector reform 	<ul style="list-style-type: none"> • Enhanced naval presence to improve SLOC security and partner with local forces • Sufficient ground combat forces to deter regional competitors and to support allies if indigenous forces are overwhelmed • Financial assistance to regional partners to build partner security sector capacity to conduct COIN
PACOM	<ul style="list-style-type: none"> • Ground and air forces to deter North Korean attack or to supplement South Korean forces in the event of an invasion • Strong naval and air presence in the Western Pacific • SOF direct action capability • Training and advisory teams to build local COIN capacity 	<ul style="list-style-type: none"> • Additional training and advisory teams to build local COIN capacity • Enhanced naval presence to improve SLOC security and partner with local forces 	<ul style="list-style-type: none"> • Substantially enhanced naval presence to establish sea control • Enhanced capability in littoral warfare • Enhanced capability to partner with local maritime forces • Increased medium range strike capability • Increased stealthy strike capability • Financial assistance to regional partners to build security sector capacity
EUCOM	<ul style="list-style-type: none"> • Sufficient military presence to train, exercise, and partner with NATO allied armed forces • Naval and air forces that can deploy promptly to Middle East or Africa if needed 	<ul style="list-style-type: none"> • Improved capability to rapidly deploy forces out of area 	<ul style="list-style-type: none"> • <i>No additional capabilities needed</i>
AFRICOM	<ul style="list-style-type: none"> • Capabilities to support developing partners' security forces, to include security sector reform • SOF direct action capability 	<ul style="list-style-type: none"> • Substantial increase in capabilities to support developing partners' security forces, to include security sector reform • Improved SOF direct action capability 	<ul style="list-style-type: none"> • Financial assistance to regional partners to support security sector reform

Combatant Command	Direct COIN	Build Local Defend Global	Rising Peer
SOUTHCOM		<ul style="list-style-type: none"> • Capabilities to support developing partners' security forces, to include security sector reform • Improved SOF direct action capability 	<ul style="list-style-type: none"> • Enhanced capability to partner with local maritime forces
NORTHCOM	<ul style="list-style-type: none"> • Partnership capacity building with local forces • SOF direct action capability 	<ul style="list-style-type: none"> • Capabilities to support developing partners' security forces, to include security sector reform • SOF direct action 	<ul style="list-style-type: none"> • <i>No additional capabilities needed</i>
STRATCOM	<ul style="list-style-type: none"> • Strategic nuclear forces sufficient to deter strike from Russia or China • Development of national missile defense systems • Provide cyber security 	<ul style="list-style-type: none"> • Improved long range strike capability • Strategic nuclear forces sufficient to deter strike from Russia or China • Development of national missile defense systems 	<ul style="list-style-type: none"> • National missile defense capable of dealing with limited attack • Enhanced repositionable ballistic missile defense capability • Improved long range stealthy strike capability
SOCOM	<ul style="list-style-type: none"> • Direct action capability worldwide 	<ul style="list-style-type: none"> • Enhanced ability to respond to emerging direct action needs 	<ul style="list-style-type: none"> • <i>No additional capabilities needed</i>
JFCOM	<ul style="list-style-type: none"> • A military R&D program that ensures steady improvement in weapon systems, C4ISR and other enablers • Strategic lift capability to respond to a major theater war • Global command and control capability to monitor deployment of military forces world-wide • Lift and C3 ability to shift forces to any combatant command to respond to unforeseen contingency 	<ul style="list-style-type: none"> • Training and advisory teams available to bolster efforts of regional commands as needed • Sufficient ground forces to reinforce forward deployed units in event of crisis • Substantial ISR surge capacity 	<ul style="list-style-type: none"> • A military R&D program that ensures steady improvement in weapon systems, C4ISR and other enablers

Translating Required Capabilities Into Investment Options

The Direct COIN strategy serves as the analytic baseline and provides a frame of reference in which increments and decrements can be made to provide the capabilities required to underwrite a change in strategy. To illustrate the technique, the major components of active duty forces are “allocated” to the several combatant commands in this section as shown in Table A.4. Table A.4 indicates the ASCC to which the forces are assigned. For example, forces supporting CENTCOM are aligned with ARCENT. Appendix B provides detailed lists of the resulting force structures.

The research team made this notional allocation based on the current demands placed on the armed forces by combatant command, which in turn reflect the strategic choices made since the turn of the century. The results of these choices were shown in Table A.4, which gives the current program strategic objectives. In some instances, a number of units is followed by a parenthesis that breaks the allocation into two separated by “/”. The number before the “/” indicates forces that are specifically oriented to the ASCC; the number after it is the number of units held by the FORSCOM “earmarked” to that ASCC. The units listed after the “/”, then, are listed again under FORSCOM.⁶⁴ The ground force contribution only is listed. This list is drawn from RAND research done for the J-8 that specified the combatant command “demand” for forces from all services.⁶⁵

ARCENT. The operations in Iraq and in Afghanistan have generated a heavy requirement for all types of forces, but ground forces in particular. This current program assumes a sizable drawdown in U.S. forces in Iraq over the coming decade, but recognizes that those countries and the region in general, will continue to be a top focus for the U.S. military. Ongoing, albeit diminished, responsibilities in Iraq and Afghanistan in addition to the need to respond quickly to other emerging threats in the region, result in an enduring heavy commitment of U.S. ground forces. In Table A.4, 18 BCTs are indicated as the core requirement while a further 15 BCTs, included in FORSCOM, are earmarked for CENTCOM. In like manner, there is a core requirement for 10,000 Special Operations Forces and a further earmark of 23,000 SOF forces.

USARPAC. The requirements for forces in the PACOM AOR remain substantial even as they are shifting. There is still a need for three BCTs to maintain a rotation base

⁶⁴ Readers will recall that all forces not assigned to one of the other geographic or functional combatant commands are assigned to FORSCOM.

⁶⁵ Davis et al., 2008; Gompert et al., 2008.

Table A.4: Major Elements of Direct COIN (Analytic Baseline) Army Force Structure

Program	ASCC	Service
33 (18/15) BCTs	ARCENT	Army
33K (10/23) SOF troops	ARCENT	Multi
6 (3/3) BCTs	USARPAC	Army
4 (1/3) BCTs	USAREUR	Army
21 BCTs	FORSCOM	Army
26K SOF	FORSCOM	Multi

of one BCT in Korea. Three other BCTs would be earmarked to USARPAC in the event of the need to reinforce, but are otherwise available to FORSCOM. In the event of a conflict in Korea, the great bulk of the ground forces would be provided by the South Koreans, and the U.S. contribution would be heavily weighted toward air. Islamist movements and other sources of instability in the Southeast Asian region generate a requirement for some 3,000 Special Operations Forces to support operations in the region, with another 3,000 available should those operations intensify.

USAREUR. The requirement for forces for EUCOM operations diminished with the dissolution of the Warsaw Pact and breakup of the Soviet Union, but the strong U.S. relationship with Western Europe and the need for continued presence throughout the Atlantic and Mediterranean call for a measure of current program forces. An Army brigade combat team is projected as a core requirement, while three further BCTs are earmarked.

FORSCOM. Most of the force structure is fungible. It can be put at the service of any combatant command. The analytic baseline reflects this. Although it fully allocates or earmarks major active duty force structure components to the combatant commands, this is specifically to understand the *demand* generated by the combatant commands and how it varies with alternative strategies. Those forces that are not considered a core command requirement and the “earmarked” forces are especially available for worldwide deployment.

USARSO, USARAF, ARNORTH and ARSTRAT have no significant forces assigned to them.

Translating Required Capabilities into Programs and Force Shifts to Support a Build Local Defend Global Strategy

The forces that need to be changed from their current distribution and resource allocation to underpin a strategy of Build Local Defend Global are summarized in Table A.5. Only those combatant commands with resource changes are discussed. There are a number of ways of providing the requisite increase in forces. The programs indicated below are an initial judgment of how to deliver the required capabilities effectively. The

Table A.5: Force Shifts for the Build Local Defend Global Strategy

Program/Shift	ASCC
Cut 3 BCTs Cut 6 SF groups	ARCENT
Convert CENTCOM brigade-equivalent to training and advisory units; deploy to CENTCOM and FORSCOM	ARCENT/FORSCOM
Add 4 SF groups	USARAF
Cut 2 BCTs	USAREUR
Add 2 SF groups	USARSO
Move 3 BCTs from PACOM to National Command	USARPAC/FORSCOM
Create Advisory Corps; convert 3 BCTs to general purpose training units	ARCENT/FORSCOM

choice of specific programs is best done by Army force planners and analysts who do this on a regular basis for Army and Joint planning and programming.

Establishing a notional “advisory corps” is one of the major shifts in programs and forces envisioned under this strategy. While we discuss the organization and functions of this notional force in Chapter 3, its focus is on providing capabilities to support efforts to develop partner security *at scale*. Organizing and conducting training and education at scale is an area in which the conventional army arguably possesses a comparative advantage over Army Special Forces. Given the significantly reduced operational demands envisioned under this strategy, it is not reasonable to assume that conventional forces would be employed to support small-scale training missions that Army Special Forces probably would perform much more effectively. The research team neither endorses nor condemns the advisory corps concept; we use it purely to provide a plausible and distinctly different alternative strategy. The majority of these units would be oriented towards CENTCOM, but 40 percent would be placed under FORSCOM, providing a force that can be targeted at partner nations in the greatest need.

ARCENT. The focus of this strategy is to develop sizable, capable indigenous security forces, as well as the civil apparatus—police, justice, corrections—necessary to provide effective internal security and governance. Nowhere is the challenge more critical than in CENTCOM’s area of responsibility (AOR). There are currently large U.S. and allied forces in Iraq and in Afghanistan that, if this strategy is to succeed, must be replaced by local forces capable of maintaining stability and defending borders from determined troublemakers.

This is a tall order. First and foremost in priority is a robust expansion of the program to develop indigenous forces to prepare them to take the lead in counterinsurgency operations. Two advisory divisions from the new advisory corps would provide the

capacity to develop Iraq's and Afghanistan's security forces. As the indigenous forces take root, three brigade combat teams and six Special Operations Forces group-equivalents can be expected to be freed up. The latter contingent would be divided between AFRICOM and SOUTHCOM to deal with emerging threats and enhance combatant commands' capability to develop partners' capacity within their AORs.

Other government agencies would play a key role in this strategy; indeed, much of the additional cost comes from expenditures by the State Department, the U.S. Agency for International Development (USAID), and other U.S. government agencies.

The Build Local Defend Global strategy would also include harnessing the capabilities of local forces for shallow water naval operations (maintaining security in ports, straits, and coastal waters). As local forces picked up the bulk of land operations, the U.S. would enhance its supporting role, providing ISR for those forces.

USARPAC. For four decades, PACOM's strategy has been to provide forces to fight alongside local allied forces to underpin their defense. The focal point for land forces has, up to now, been South Korea. With its substantial growth in the past four decades, South Korea dwarfs North Korea in gross domestic product and in population, leaving it in a much improved position to defend itself against an invasion. Deterrence against the North's use of nuclear forces would be a matter of national policy implemented by STRATCOM (not shown). The United States should be able to pay increased attention to other regional threats. Other friendly forces in the region, Indonesia for example, need improved counter-insurgency capabilities. An expansion of the program to assist partner nations in combating insurgencies is needed. Compared to CENTCOM, the threat of insurgency is less advanced, so a focus on preventing those conditions that give rise to insurgencies and instability is warranted—additional funding would be programmed for economic development assistance and government capacity building. This foreign assistance program would largely fall under the purview of the State Department.

An additional Special Forces company would complement existing forces. FORSCOM would also retain a reserve of conventional military transition teams (MiTTs) to commit to priority areas as needed. The capacity of non-DoD agencies, USAID in particular, to support ongoing COIN operations would be enhanced.

These measures, along with the growing capabilities of the South Korean military, would ease the requirement for U.S. ground forces to be prepared for land operations in Asia. The demand for Army forces in PACOM could be reduced by three BCTs.

As local forces picked up the bulk of land operations, the United States would enhance its supporting role, providing, as in the case of CENTCOM, ISR for those forces. Primary responsibility for shallow water naval operations (maintaining security in ports, straits and other key sea lines of communication [SLOC] points, and coastal waters) would be passed to the local forces.

USAREUR. In this strategy, the United States would continue the trend of reorienting ground forces away from the territorial defense of Europe. The European

members of NATO (and non-NATO members of the European Union) have more than enough wealth and population to defend their territory against invasion. Under this strategy, the demand for ground forces in the EUCOM AOR could be reduced by two BCTs.

EUCOM would be tasked to work with our European allies to encourage them to develop expertise in counterinsurgency and building partners' capabilities operations and to share the burden in these operations outside of NATO's borders. This would include EUCOM's intensifying liaison and coordination with allies in ongoing COIN operations in Afghanistan and, over the longer term, in Africa.

USARAF. A key challenge for AFRICOM is to enable the development of capable indigenous militaries and to focus U.S. capability on supporting them by striking against difficult, high value targets. Four group-equivalents would be reoriented from CENTCOM to AFRICOM and a Special Forces (SF) company would be added to AFRICOM. These forces would provide a capability to strike high value targets and to cultivate partners' counterinsurgency capability in the command's AOR. In addition, JFCOM would hold a reserve of conventional MiTTs ready to assist in priority areas. The capacity of non-DoD agencies, USAID in particular, to support ongoing COIN operations would be enhanced.

Local forces would maintain responsibility for shallow-water naval operations (defending offshore energy infrastructure; maintaining security in ports, straits, and coastal waters) with capacity-building assistance from the U.S. Navy.

USARSO. This strategy envisions the U.S. contribution to security in the region to train local forces and to provide specialized capabilities to complement their capabilities.

Two SF group-equivalents would be reoriented from CENTCOM to SOUTHCOM and an SF company would be added to SOUTHCOM. These forces would provide a capability to strike high value targets and to cultivate partner nations' counter-insurgency capabilities in the command's AOR.

The local forces would maintain responsibility for shallow water naval operations (maintaining security in ports, patrolling major rivers, straits, and coastal waters) with capacity building assistance from the U.S. Navy.

FORSCOM. As the U.S. forces pull "off-shore" from the CENTCOM, PACOM, and EUCOM AORs, not all are removed from the force. FORSCOM maintains a portion of those forces.

Implementation of this strategy reduces the requirement for eight forward-deployed BCTs. Of these, three BCTs are shifted to FORSCOM to hedge against misjudgment in one of the theaters and the need to refocus ground forces on a requirement that could emerge from one of the AORs (most likely CENTCOM). Several BCTs worth of force structure would be converted to support creation of the notional advisory corps. The

preponderance of these units would be deployed to CENTCOM. In addition, one Special Forces battalion is held by SOCOM to augment regional combatant commands’ direct action capabilities as necessary. Four squadrons of medium-altitude long-endurance unmanned aerial vehicles (UAVs) and a detachment of high-altitude long-endurance (HALE) UAVs provide surge capability to both monitor and strike emerging threats.

ARSTRAT. With the United States “offshore” supporting allied and partner forces, a squadron of long-range surveillance and strike aircraft is added to STRATCOM to provide the ability to strike anywhere on the globe promptly and with precision.

Programs and Force Shifts to Support Rising Peer Strategy

The forces that need to be enhanced above the current program forces and existing program to underpin a Rising Peer strategy are summarized in Table A.6. Only those combatant commands with resource changes are discussed. The programs indicated below are an initial judgment of how to deliver those capabilities most effectively and cost-effectively. The choice of specific programs, a critical step in the methodology, demands input from planners and programmers in the Army.

Table A.6: Programs and Force Shifts for Rising Peer Strategy

Program/Shift	ASCC	Service
Cut 3 BCTs	ARCENT	Army
Shift 8 BCTs from ARCENT to FORSCOM	ARCENT/FORSCOM	Army
Move 3 BCTs from EUCOM to National Command	USAREUR/FORSCOM	Army

ARCENT. The focus of this strategy shifts away from the CENTCOM region and leads to a substantial scaling back of U.S. participation on land. Eight BCTs are shifted away from their CENTCOM orientation. That said, we are still concerned about the threat posed by terrorist havens. Sizable forces remain in the current program to provide for CENTCOM requirements. In addition, security assistance and foreign aid to the area are increased. This effort shares a goal with the aid provided in the Build Local Defend Global strategy—reducing the burden on the U.S. Army by building local capacity—but it is conducted at a much-reduced scale.

The United States will also help the countries in the region ensure the security of their ports, energy infrastructure in coastal regions, and SLOC choke points.

USARPAC. The strategic thrust of the Rising Peer strategy is to cultivate a constructive relationship with China. This approach does not have direct resource implications, but it informs initiatives in PACOM.

USAREUR. The center of gravity of this strategy shifts solidly to the Pacific rim. Two BCTs are shifted from their EUCOM focus to be held by the National Command for

allocation as needed to unforeseen requirements that could emerge. Although no military capabilities are assigned for this purpose, the United States could engage with European allies to encourage a broader European role in CENTCOM, AFRICOM, and elsewhere to backfill for the United States as it focuses primarily on China.

USARAF. The DoD would look to AFRICOM to limit the penetration of Chinese influence in Africa. A key element of this strategy would be to deepen military ties with the indigenous security forces.

USARSO. The DoD would also look to SOUTHCOM to limit the penetration of Chinese influence. A key element would be working with indigenous land forces and with select countries to defend their coastal waters and execute riverine operations.

FORSCOM. Three BCTs removed from CENTCOM and EUCOM are maintained in the force structure and put into the same pool for allocation to whatever combatant command has an unanticipated requirement.

ARSTRAT. China is in the process of expanding the range and accuracy of its conventional strike systems. It is also upgrading and extending the range of its ISR capacity. This strategy envisions STRATCOM picking up responsibility for longer-range aircraft that can strike targets on the littoral of China promptly from strategic distances. There are two STRATCOM strike programs: a squadron of long-range surveillance and strike aircraft⁶⁶ and long-range conventional ballistic missiles.

A squadron of unmanned aircraft is brought into the force to enhance the U.S. ability to develop operational-level ISR in and around China and in other areas of interest.

Finally, China has demonstrated its capability (and perhaps signaled its willingness) to shoot down low-earth-orbit satellites. This is precisely the type of satellite on which we depend for our theaterwide ISR. Communications and GPS satellites could also be at risk. Therefore, as a backup capability, i.e., to plug a gap in coverage rapidly should the need arise, a program that procures additional HALE UAVs is introduced. These would be held back in time of crisis specifically to ameliorate any loss of satellite ISR coverage and could also serve in a limited capacity as theater communications relays.

Methods for Developing Alternative Force Structures

The first step in assessing strategies' operational Army costs is to develop alternative force structures aligned with combatant commanders' objectives as outlined under each alternative strategy. Translating changes in combatant commanders' objectives into changes in force structure is a task best left to experienced operational planners. We do not claim to have invented any improvement on existing processes for doing so. Indeed,

⁶⁶ In considering future programs, the Air Force frequently considers modernizing the existing bomber fleet, and refers to option alluded to here as a "future long range bomber." The authors prefer the term "long range surveillance and strike aircraft," which explicitly names what should be two core capabilities for a stealthy future platform.

the alternatives we offer in this report are entirely notional and are included purely for illustrative purposes. There are several tools available to the analyst for developing these alternatives, however. We describe them below.

The approach we used in this study was to elaborate on alternative force structures developed for *Analysis of Strategy and Strategies of Analysis* (Gompert et al., 2008) and other related strategies. Those prior alternatives included only major combat units, such as brigade combat teams and Special Forces groups. We refined those alternatives by including combat support and combat service support capabilities in the alternative force structure using Army rules of allocation. We describe that process below, as well as alternative approaches. Alternative approaches include relying on Multi-Service Force Deployment Documents (MSFDDs) emerging from DoD's Analytic Agenda and using historical deployment data. Regardless of the data sources used to develop an alternative force structure, that force structure should include the capability and capacity needed to deal with the range of contingencies analysts and decisionmakers believe might plausibly occur simultaneously.

In any case, planners must work within certain constraints. In the Army's case, the obvious constraints include endstrength and total obligational authority. Any investment option that could satisfy all plausible requirements with minimal risk probably would be fiscally infeasible. Other constraints include the capabilities and capacity provided by other Services. While the Army must account for other Services' plans in its analysis, it cannot assume that the other Services will adapt their capabilities in response to Army initiatives. At the outset, the Army must assume that other services will adhere to previously stated plans and development strategies.

Using the Army's Rules of Allocation

As noted, the approach we used in this study was to apply Army Rules of Allocation (ROA) to the force structures we had developed for previous studies. The Army uses ROA in Total Army Analysis (TAA) to estimate the enablers required to support maneuver forces in a particular contingency operation. According to AR 71-11 and the Army War College text *How the Army Runs*, there are three kinds of rules of allocation:

- **Manual, or direct input** rules, which consist of “stand alone” capability demands in theater. These can either be the maneuver forces in question, or certain elements of theater infrastructure, e.g., the army service component command.
- **Existence** rules, which derive requirements from one kind of unit from the existence of another. An example might be the rule that prescribes one division headquarters for every two to five brigade combat teams. We rely principally on existence rules in this analysis.

- **Workload** rules, which base requirements for certain types of units on the amount of work required from them in a particular campaign or set of campaigns. For instance, the number of pipeline companies the Army needs depends on the length of pipeline required to support operations in a specific contingency.⁶⁷

For this study, we relied mostly on existence rules of allocation. We started with the Army's baseline force structure as described in the 2010 QDR, then incremented or decremented that force structure by the number of BCTs or Special Forces groups indicated by our previous work. We also incremented or decremented the force structure by the number of combat support and sustainment units appropriate to the increment or decrement in brigade combat teams. For example, for every four BCTs cut from the force structure, we cut one division headquarters as well.

It is unwise, however, to simply apply the rules of allocation mechanically. TRADOC develops the rules of allocation to fit a particular strategic context. According to the Army's force development model, a change in strategic circumstances should instigate fundamental reconsideration of unit designs and support requirements. The best example of this was the Army's adoption of modularity as an organizational design principle in response to the need to sustain continuous stability operations on a global scale. The Army's adoption of the brigade combat team as the fundamental building block required redesign of the Army's entire support and sustainment structure. As unit designs changed, so did support relationships. The support relationships embodied in the Army's rules of allocation today could change over time in response to an alternative strategy.

We therefore made further adjustments to the proposed force structure, beyond those suggested by the rules of allocation. In some cases, such adjustments merely involved revisiting earlier rules of allocation. For the Rising Peer strategy, for instance, we revisited the rule that allocated one fires brigade for each division. In other cases, such as in the Build Local Defend Global Strategy, we designed a new organization, an advisory corps. To the maximum extent possible, we relied on designs already proposed by defense analysts, restricting our efforts to fleshing out the support units that analysts often omit in their proposals. Our intent in designing these structures was to develop a framework that would enable us to estimate the cost and support requirements for a like capability, not to recommend their precise structure to the Army. Finally, we applied our own judgment. For example, as will be explained shortly, we added three air defense brigades to the force structure for the Rising Peer strategy because the context posited required mitigating U.S. Pacific bases' vulnerability to air and missile attack.

⁶⁷ Harold W. Lord, ed., *How the Army Runs: A Senior Leader Reference Handbook*, Carlisle Barracks, Pa.: The U.S. Army War College, 2011, p. 63–64. See also Army Regulation 71-11, *Total Army Analysis*, 1995, p. 1.

Multi-Service Force Deployment Documents

Multi-Service Force Deployment Documents (MSFDDs) are another useful source of information for developing alternative force structures. As noted in the introduction, DoD's Analytic Agenda helps assess the capabilities and capacity needed for future contingency operations. The Analytic Agenda consists of a number of Defense Planning Scenarios (DPSs), which describe a notional strategic problem that takes place in a particular country or geographical region, such as the Strait of Hormuz. MSFDDs describe the concept of operations and joint forces that might be used to resolve the crisis described in a particular planning scenario. Because they are classified, we did not use MSFDDs in the analysis described in this report.

Analysts can use this information to determine how force structures might be altered in response to a change in defense strategy and, consequently, combatant commands' objectives. They should start by inferring what those changes imply about the range of scenarios U.S. forces have to be prepared to conduct in each AOR. Increments or decrements to the scenario set imply increments or decrements to the forces required to meet the resulting range of scenarios.

The analyst cannot simply aggregate the resulting MSFDD force tables, however. The United States cannot afford to maintain sufficient forces to resolve every single potential contingency. Instead, planners try to estimate how much capacity, of which capabilities, U.S. joint forces might need at any one time. The phrase "two near-simultaneous major theater wars," which used to dominate the DoD discussion of force-sizing, conveys the essence of the simultaneity problem. The issue of simultaneity persists and is reflected in the force-sizing construct described in the 2010 *Quadrennial Defense Review Report*.⁶⁸

Historical Deployment Data

Army analysts can also draw upon historical deployment data to assess capabilities and capacity needed for certain kinds of contingency operation. The Operations Directorate in HQDA G-3/5/7 can provide authorized parties with information on the number, type, and manning of units deployed to various contingencies over any given period of time. In general, analysts must glean the objectives and concept of operations associated with these deployments from other sources. Deployment data provide the most complete picture of the capabilities and capacity needed to resolve a particular operational problem. On the other hand, historical data clearly do not reflect improvements in concepts or capabilities that may have occurred since the contingency itself.

⁶⁸ 2010 QDR, p. 41–43.

Appendix B: Alternative Force Structures

Illustrative Alternative Force Structures

In this section, we describe the operational Army implied by each alternative strategy and list the landpower capabilities the Army must provide to support the alternative. We begin by determining the capabilities and capacity each combatant commander will need to accomplish assigned objectives. Next, we aggregate the various operational Army units needed to support each combatant commander's objectives into a single list for each strategy. In this chapter, we present only the aggregate list; Appendix A includes tables describing the distribution of forces by combatant command for each strategy. While Army leaders must pay close attention to individual combatant commands' requirements, they are charged with meeting aggregate demand. Assigning or apportioning forces to different combatant commands remains the Secretary of Defense's prerogative. The research team relied on other analysts' work to develop the force structures we explore. While plausible, we used these alternatives solely to illustrate the methodology.

We present these alternatives in particular to illustrate the issues of substitution. Often, new strategic concepts include new capabilities and force designs. For example, John Nagl's 2007 proposal to establish an advisory corps supported the strategic concept of preventive engagement, later embodied in the 2010 QDR and highlighted in the January 2012 *Defense Strategic Guidance*. In evaluating the strategic concepts and the supporting capabilities, planners must struggle with difficult questions about the degree to which new designs can replace or improve upon existing capabilities to meet anticipated demands. Moreover, analysts must add sufficient detail to proposed capabilities to allow them to estimate costs for those designs. We do not argue that we have necessarily gotten the detail right, but wish to demonstrate why it is necessary to do so to estimate costs.

The Analytic Baseline: The Direct COIN Army

We began our analysis by establishing an analytic baseline. For that baseline, we used the Army's programmed force for FY 13, depicted in Table B.1 below. It represents a relatively comprehensive and mature solution to waging irregular warfare against Al Qaeda and associated elements, while contributing to deterrence in other regions. This problem set corresponds closely to that described in our Direct COIN strategy.

This force structure consists of six major kinds of units. First, there are theater commands. Theater commands provide the landpower capabilities needed to establish

and maintain U.S. joint forces in a theater of operations. They provide the theater infrastructure that includes communications, theater air defense, port operations, and intelligence, to name some of the most important. These units are constantly manned and seldom rotate. The rest of the Army is organized under the modular concept, and is meant to function under cyclic readiness. That is, it is designed to be significantly larger than what might be required in various theaters at any given time, so that the Army can sustain steady-state operations over an extended period. The modular Army includes operational army headquarters, like corps and divisions; brigade combat teams; multi-functional support brigades, meant to provide direct support to brigade combat teams; and functionally organized brigades, meant to provide specific capabilities when required. There are also some specialized brigades, such as the contracting support brigade, that are relatively small but provide critical skills.

Overall, the direct COIN strategy assumes that terrorism and insurgency pose substantial threats to U.S. security, and that timely and effective U.S. intervention is required to combat those threats. While those assumptions are no longer in vogue, they certainly informed Army planning throughout much of the last decade. The 2009 Army Posture Statement, for instance, states

Violent extremist groups such as Al Qaeda . . . consider themselves at war with western democracies and even certain Muslim states. Looking ahead, we see an era of persistent conflict—protracted confrontation among state, nonstate, and individual actors that are increasingly willing to use violence to achieve their political and ideological ends. In this era, the Army will continue to have a central role in providing full spectrum forces necessary to ensure our security.⁶⁹

Thus we may fairly say that operational Army planned at that time would support the Direct COIN strategy described in this report.

To support this strategy, the Army must provide a steady stream of operational Army forces organized, trained, and equipped for irregular warfare “amongst the peoples” on a very large scale. As an adjunct and complement to these operations, the Army must also provide capabilities to develop multinational partners’ capability and capacity. The Army that supports this strategy requires ample manpower and a deep rotational pool of units to sustain operations of indeterminate duration. It requires fewer units whose primary purpose is to augment maneuver forces’ lethality, and more units capable of providing security and assisting in reconstruction. The Army must also hedge against the unexpected outbreak of war elsewhere.

⁶⁹ The Honorable Pete Geren and General George W. Casey, *2009 Army Posture Statement*, Washington, D.C.: Department of the Army, 2009, introductory letter.

The following paragraphs explain the rationale behind the research team's allocation of forces to the various Army service component commands and the generating force, from which the foregoing cost estimates are derived. Current trends toward reducing operational Army commitments in Europe continue, while allocations to the PACOM AOR responsibility remain both stable and relatively light. Allocations address the number of BCTs available for use to the combatant command, not their component (active or reserve). Finally, these allocations presume a certain level of complementary joint capability allocated to the various combatant commanders.

ARCENT. The bulk of operational Army forces remain committed to ARCENT, as they are in current overseas contingency operations. At the time we conducted our analysis, the United States was reducing its commitment to Iraq and increasing its commitment in Afghanistan. Our analysis posits that future major counterinsurgency efforts may take place in this region, as well.

Maneuver forces allocated to this region consist principally of brigade combat teams and combat aviation elements. An allocation to ARCENT of 24 BCTs, with 18 more available from FORSCOM if necessary, allows ARCENT to maintain 14 BCTs on operations on a steady state basis.⁷⁰ To enhance their capability for stability operations, each BCT will be augmented by attached military transition teams, engineers and Civil Affairs capabilities. The ongoing commitment of approximately 2,200 advisors will continue.

To provide command and control capabilities to these brigade combat teams, one corps headquarters and four division headquarters are allocated to ARCENT; FORSCOM holds an additional corps headquarters and four division headquarters as a rotational force to replace those committed to theater. In addition to the theater signal command, one signal brigade and other associated communications elements support the theater. The research team assumed that overall command in a given country would remain with a joint headquarters on the order of Multi-National Force–Iraq.

A number of support capabilities are normally allocated to each division headquarters. For instance, four fires brigades are allocated to ARCENT, even though the fairly low level of combat intensity seldom requires their capabilities. Those units fill such secondary roles as augmenting command and control capabilities and providing additional manpower. Finally, contractors will continue to provide much of the sustainment support required in theater.

⁷⁰ This allocation assumes that units will spend two years at home station for every year in which they are committed to operation. As of this writing, Army forces are spending around one year at home station for every year deployed.

USARPAC. Even though the Direct COIN strategy is oriented to irregular challenges, it recognizes other challenges. In the PACOM area of responsibility, North Korea poses such a challenge and is likely to do so for some time. To be sure, the U.S. contribution in a conflict with North Korea would consist mostly of air and naval forces, supplemented by ground base enablers. We assume that the Republic of Korea would provide the bulk of ground combat forces. The actual requirement for maneuver forces is estimated to be one heavy brigade combat team and one combat aviation brigade stationed on the peninsula, and two more brigade combat teams required to reinforce U.S. forces there in the event of conflict. To command, support, and sustain those brigades, we posit a division headquarters and associated enablers. Beyond that, USARPAC includes the normal contingent of theater commands and other enablers whose purpose is to shape the theater and enable operations of any scale.

USARAF. The research team assumed few landpower capabilities would be committed to the AFRICOM area of responsibility. The Army would continue to support building partners' capacity and targeted efforts to combat terrorism in Africa.

USARSO. The Direct COIN strategy anticipates no significant commitment of U.S. forces to Latin America. Army forces and others would occasionally participate in combined training events and other security cooperation activities.

ARNORTH. Two brigade combat teams are allocated to NORTHCOM to assist in consequence management in the wake of natural disasters or terrorist strikes.

ARSTRAT (U.S. Army Space and Missile Defense Command). Primarily, ARSTRAT commands U.S. Army missile defense capabilities dedicated to national missile defense, such as ground-based midcourse interceptors and radars.

FORSCOM. Any forces not committed in ongoing operations remain fungible. That is, they can be reallocated as events dictate. Those forces fall under FORSCOM as the Army global force manager for Joint Forces Command (JFCOM).

Table B.1 aligns forces with their Army service component command. The first number associated with each type of unit indicates the total number of units earmarked for that theater. That number includes those forces committed exclusively to that army service component command; these forces cannot be considered available for employment elsewhere except under extreme circumstances. The total also includes forces held by FORSCOM intended to provide a rotation base for that combatant command but available for service elsewhere if needed. The first number in parentheses after each entry represents the active component units in this total; the second number denotes the reserve component units devoted to it. Several unit types, including most theater commands, use individual replacement rather than lifecycle manning and therefore do not require a rotation base.

Table B.1: Operational Army Forces Supporting Direct COIN Strategy

Category	Units
Brigade Combat Teams	25 Heavy Brigade Combat Teams (18/7) 43 Infantry Brigade Combat Teams (23/20) 8 Stryker Brigade Combat Teams (7/1)
Headquarters Units	9 Army Service Component Commands (9/0) 3 Corps Headquarters (3/0) 18 Division Headquarters (10/8)
Multifunctional Support Brigades	23 Maneuver Enhancement Brigades (4/19) 19 Aviation Brigades (11/8) 10 Battlefield Surveillance Brigades (4/6) 13 Fires Brigades (6/7) 32 Multifunctional Sustainment Brigades (14/18)
Support Brigades	7 Air Defense Brigades (5/2) 3 Chemical Brigades (1/2) 16 Engineer Brigades (5/11) 11 Military Intelligence Brigades (10/1) 14 Signal Brigades (10/4) 10 Military Police Brigades (4/6) 2 Military Police Brigades (CID) (2/0) 4 Quartermaster Groups (Petroleum, Oil And Lubricants) (1/3) 3 Explosive Ordnance Disposal Groups (2/1) 14 Medical Brigades (4/10) 42 Regional Support Groups (0/42) 7 Theater Aviation Brigades (1/6) 9 Civil Affairs Brigades (1/9)
Theater Commands	3 Theater Air And Missile Defense Commands (2/1) 2 Theater Aviation Commands (0/2) 4 Civil Affairs Commands (0/4) 1 Support Command (CBRNE) (1/0) 2 Theater Engineer Commands (0/2) 13 Expeditionary Support Command (4/9) 2 Theater Military Police Commands (0/2) 3 Theater Signal Commands (2/2) 1 Information Operations Command (1/0) 4 Theater Medical Commands (2/2) 5 Theater Sustainment Commands (3/2) 5 Human Resources Sustainment Centers (3/2) 1 Army Network Operations Support Center (1/0) 6 Theater Network Operations Support Center (6/0) 8 Financial Management Centers (4/4) 1 Medical Logistics Management Center (1/0)

Army Force Shifts to Support the Build Local Defend Global Strategy

The Build Local Defend Global strategy presents the most complex set of requirements for the Army. As an enterprise, the Army would have to improve its capability and capacity to develop partner forces at scale, a mission requiring capabilities from both the operational Army and the generating force. This strategy's intent is to reduce the requirement to commit U.S. forces to counterinsurgency and stability operations abroad. The Army would still have to retain sufficient capability as a hedge to conduct operations directly when local forces cannot contain significant threats to U.S. interests.

In order to estimate the operational Army's requirements to support a Build Local Defend Global strategy, we had to postulate an Army for doing so. To provide Army capabilities to build partners' capability and capacity, John Nagl, Andrew Krepinevich and other analysts have recommended creating an "advisory corps" in the operational Army.⁷¹ Our study team took no position on whether this concept represented an optimal solution to the strategic challenge of developing partner capabilities and capacity. Supporters of the "advisory corps" concept argue that it represents a minimal investment of manpower with potentially high strategic returns and would enable America to leverage less-costly indigenous security forces. Because an "advisory corps" represents a plausible solution that might be considered in DoD deliberations, we used it as a framework to estimate its likely costs.

To estimate the long-term costs of an advisory corps, we had to postulate its mission and organization. Nagl's proposed advisory corps would supply additional operational Army capacity to efforts to develop partners' forces and would be responsible for the generating force function of developing and refining U.S. Army advisory capabilities. His concept also implies a focus on large-scale efforts, in that his "Divisions of Combat Advisors" are modeled on the Iraq Advisory Group, the organization charged with supporting U.S. Army advisors in that country.⁷² We made scale explicit. For that reason, the advisory corps we describe here is intended to undertake the large-scale development of partners' security forces.

The issue of scale is important because it is where the Army provides a comparative advantage relative to Special Forces.⁷³ The Build Local Defend Global strategy assumes a general reduction in operational tempo as U.S. forces disengage from direct operations and rely more on local partners. This construct means that Special Forces will once again be available to perform small-scale foreign internal defense missions, mitigating the need for conventional forces to provide additional *capacity*. The Army, however, has an inherent and unique capability to develop capabilities and capacity wholesale, a capability often required for security sector reform. Under this strategy, Army forces would undertake missions requiring the development of a full range of partner landpower capabilities, including maneuver forces, enablers and partners' generating forces.

⁷¹ John Nagl, "Institutionalizing Adaptation: It's Time for a Permanent Army Advisor Corps," Washington, D.C.: Center for a New American Security, June 2007; Andrew F. Krepinevich, *An Army at the Crossroads: Strategy for the Long Haul*, Washington, D.C.: Center for Strategic and Budgetary Assessments, 2008, p. 54–57.

⁷² Nagel, 2007, p. 6.

⁷³ Again, we note that while Special Forces soldiers are members of the U.S. Army, U.S. Special Operations Command and the Office of the Secretary of Defense largely determine their size and composition.

We based our proposed force structure for an advisory corps on Nagl's, augmenting his framework with necessary support and sustainment capabilities. We did not, however, alter his proposed advisory structure. Transition teams require force protection, integrated communications support, transportation, and other logistics support in order to function. A large-scale, distributed assistance effort will require aviation support as well. We included additional support and sustainment organizations we deemed necessary in our notional force structure. Readers should not attach too much importance to the specific advisory corps organization shown. Its purpose is to identify proxies for costing, not to recommend adoption of such an organization. Table B.2 depicts an Advisory Corps structure, functions, and equivalent units for costing purposes.

The question of where the advisory corps would operate is also significant. Location largely dictates the number of theater commands required. If we anticipate these efforts taking place in an established theater, such as the PACOM or the CENTCOM areas of responsibility, the number and orientation of theater commands would not change. Since operations might also take place in a previously underdeveloped theater, the Army would have to create new commands to support that theater. For the purposes of analysis, we posited that future large-scale capacity-building efforts would occur in Africa, which lacks a well-developed theater infrastructure. The chaos in Somalia, instability in the Gulf of Guinea, and instability in southern Africa are all circumstances that plausibly could require large-scale efforts at security sector reform.

For all the importance of capabilities to develop partners' capabilities and capacity to underpin this strategy, the bulk of the operational Army still consists of traditional maneuver units and enablers. Reduced operational tempo will allow the Army to reduce the number of brigade combat teams it maintains by some 11 heavy BCTs. The Army can also reduce the number of division headquarters by three, together with major associated enablers. As with previous tables, the first number in parentheses indicates how many of the units indicated come from those assigned to the combatant command; the second indicates changes to the number of units under FORSCOM's command earmarked for the combatant command in question. The resulting operational Army force structure is depicted in Table B.3.

The operational Army resources devoted to projection also increase. Under this strategy, the Army would be expected to deploy forces relatively rapidly to restore equilibrium when insurgents start to achieve tactical overmatch, as when the 1st Cavalry Division deployed to Vietnam in 1965 to defeat a communist offensive in the Central Highlands. In contrast to the Vietnam example, however, the force would then redeploy rapidly as well, becoming available for deployment elsewhere.

Table B.2: Notional Advisory Corps Force Structure and Equivalent Costs

Organization	Quantity	Mission	Equivalent Costing Unit
Advisory Corps Headquarters	1	<ul style="list-style-type: none"> • Advisory Corps Capabilities Development • Force Provider (equivalent to Army Service Component Command) • Coordinating and integrating externally provided capabilities into subordinate elements 	Division headquarters
Combat Advisor Division Commander and Staff	3	<ul style="list-style-type: none"> • Planning, directing, resourcing and assessing all efforts to develop landpower capabilities in a partner nation • Providing command and control for U.S. direct support to partners, either with or without combat 	Infantry Brigade Combat Team (IBCT) Headquarters And Headquarters Company (HHC)
Division Advisor Team		<ul style="list-style-type: none"> • Advising host nation division commanders and staff • Providing command and control for U.S. support to partner units • Providing support and sustainment to assigned brigade advisor teams 	IBCT HHC
Brigade Advisor Team	120	<ul style="list-style-type: none"> • Advising host nation brigade commanders and staff • Providing command and control for U.S. support to partner units • Providing support and sustainment to assigned battalion advisor teams 	IBCT HHC (Including subordinate battalion advisory teams)
Battalion Advisor Team	600	<ul style="list-style-type: none"> • Advising host nation battalion commanders and staff • Providing command and control for U.S. support to partner units 	See above
Aviation Brigade	1	<ul style="list-style-type: none"> • Providing deployable aviation packages to support U.S. combat advisor divisions 	Theater Aviation Brigade
Sustainment Brigade	1	<ul style="list-style-type: none"> • Coordinating sustainment for deployed combat advisor divisions and subordinate elements • Providing sustainment packages 	Multifunctional Sustainment Brigade
Signal Battalion	1	<ul style="list-style-type: none"> • Maintaining communications links between deployed combat advisor divisions and other U.S. elements, especially combatant commands • Enabling combat advisor division headquarters to communicate with subordinate elements 	

Table B.3: Operational Army Force Structure Under a Build Local Defend Global Strategy

Category	Units
Brigade Combat Teams	14 Heavy Brigade Combat Teams (10/4) 43 Infantry Brigade Combat Teams (23/20) 8 Stryker Brigade Combat Teams (7/1)
Advisory Corps	See Table B.2
Headquarters Units	9 Army Service Component Commands 3 Corps Headquarters (3/0) 15 Division Headquarters (8/7)
Multifunctional Support Brigades	20 Maneuver Enhancement Brigades (3/17) 16 Aviation Brigades (10/7) 10 Battlefield Surveillance Brigades (3/5) 13 Fires Brigades (6/7) 29 Multifunctional Sustainment Brigades (12/17)
Support Brigades	7 Air Defense Brigades (5/2) 3 Chemical Brigades (1/2) 13 Engineer Brigades (3/10) 11 Military Intelligence Brigades (10/1) 14 Signal Brigades (10/4) 10 Military Police Brigades (4/6) 2 Military Police Brigades (CID) (2/0) 4 Quartermaster Groups (Petroleum, Oil and Lubricants) (1/3) 3 Explosive Ordnance Disposal Groups (2/1) 12 Medical Brigades (3/9) 42 Regional Support Groups (0/42) 8 Theater Aviation Brigades (2/6) 9 Civil Affairs Brigades (1/8)
Theater Commands	3 Theater Air And Missile Defense Commands (2/1) 2 Theater Aviation Commands (0/2) 4 Civil Affairs Commands (0/4) 1 Support Command (CBRNE) (1/0) 2 Theater Engineer Commands (0/2) 13 Expeditionary Support Command (4/9) 2 Theater Military Police Commands (0/2) 3 Theater Signal Commands (2/2) 1 Information Operations Command (1/0) 4 Theater Medical Commands (2/2) 6 Theater Sustainment Commands (4/2) 5 Human Resources Sustainment Centers (3/2) 1 Army Network Operations Support Center (1/0) 6 Theater Network Operations Support Center (6/0) 8 Financial Management Centers (4/4) 1 Medical Logistics Management Center (1/0)

ARCENT. All U.S. combat brigades were out of Iraq by the end of 2011, but U.S. strength in Afghanistan increased. Overall, we posit that the number of combat brigades would decrease by eight from the Direct COIN force structure. Enablers would also decrease accordingly. In particular, the number of division headquarters would decrease by two, one from the forces assigned to ARCENT and one from those forces in FORSCOM earmarked for ARCENT.

Even as the United States reduces the number of combat brigades in Iraq, however, it is increasing its emphasis on developing capable Iraqi security forces. Meanwhile, efforts to develop the Afghan National Army will continue at their current scale and level of intensity for some time. Two combat advisor divisions will support efforts in each country initially, eventually decreasing to one.

USARPAC. North Korea poses the most immediate threat to the security of the United States and its allies in the PACOM area of responsibility. The Republic of Korea now has an army arguably capable of defending against a North Korean invasion, reducing the requirement for U.S. ground forces both to deter and, if deterrence would fail, to fight on the ground. This increase in South Korean capability allows the U.S. Army to reduce the number of BCTs committed in the PACOM area of responsibility by three.

The United States does have an interest in forestalling instability and the concomitant risk of emerging threats to U.S. security. Such threats remain in an embryonic stage, and in this strategy are best dealt with through capacity-building efforts, including low-profile initiatives conducted by U.S. Special Forces.

USAREUR. The diminishing likelihood of land conflict in Europe, combined with European wealth and population, should allow the U.S. Army to decrease forces dedicated to the EUCOM area of responsibility. The increased emphasis on collaborative approaches within a NATO context, with the European Union, and with individual European nations militates against reducing theater forces precipitously. As recent overseas contingency operations have demonstrated, moreover, U.S. bases in Europe play an important role in supporting U.S. operations in other parts of the world.

USARAF. The prevalence of civil wars, insurgencies, and other forms of instability demonstrates a need for large-scale efforts to develop and reform indigenous security capabilities. The United States has supported security sector reform in Liberia, although relying largely on contractors, and the development of African peacekeeping capabilities under the State Department's Africa Contingency Operations Training and Assistance (ACOTA) program. Imagining a more robust U.S. military commitment to these purposes is plausible and is envisioned under this strategy.

We postulate the commitment of a combat advisor division with supporting elements to the AFRICOM area of responsibility. Beyond the Advisory Corps' organic capability, it would require support from theater assets not currently extant, including a theater sustainment command, a theater signal command, and a theater medical command.

Army Force Shifts to Support the Rising Peer Strategy

In many respects, the Army would revert to a smaller version of its Cold War incarnation under the Rising Peer strategy. The principal challenge in this strategy comes from a rising China. In a direct confrontation with China, there is at best a limited role for Army maneuver forces. The purpose of U.S. strategy in this alternative would not be to defeat China militarily, however, but rather to foreclose its temptation to resort to military force. Although Army maneuver forces may have limited utility in a war with China, Army protection assets can help avert such a confrontation. Army air and missile defense systems can mitigate the risk of a successful surprise attack, thereby ensuring conflict stability. Army forces also have a role in conducting out-of-area contingency operations, whether against Chinese proxies or rogue states. As with the Build Local Defend Global strategy, the Army would rely less on its reserve components, enabling them to revert to their role as a strategic reserve.

An Operational Army for a Rising Peer Strategy

The operational Army will be a highly capable, highly capitalized force designed to deploy rapidly to wage short, sharp, limited conflicts. The resulting Army will be smaller, but with greater technological capabilities. A significantly higher proportion of brigade combat teams will be heavy, or their future equivalent, even though the overall number will decrease. There will be a higher proportion of enablers to maneuver forces, affecting especially combat enablers like fires brigades, battlefield surveillance brigades and aviation brigades.

Under the Rising Peer strategy, the operational Army also gets smaller, this time by eight IBCTs. In contrast to the Build Local Defend Global strategy, enablers actually increase in proportion to the number of brigade combat teams, on the assumption that additional reconnaissance, fires, and maneuver enhancement capabilities represent the most cost-effective way of augmenting maneuver forces' lethality and survivability. While the number of division headquarters and combat aviation brigades decreases by two, the Army would augment its force structure by two fires brigades and two battlefield surveillance brigades over its Direct COIN force structure. As noted, the Army would also enhance its capabilities to protect U.S. bases in the PACOM area of responsibility by adding three air defense artillery brigades. Table B.4 lists the resulting operational Army.

Table B.4: Operational Army Force Structure Under a Rising Peer Strategy

Category	Units
Brigade Combat Teams	25 Heavy Brigade Combat Teams (18/7) 35 Infantry Brigade Combat Teams (17/18) 8 Stryker Brigade Combat Teams (7/1)
Headquarters Units	9 Army Service Component Commands 3 Corps Headquarters (3/0) 16 Division Headquarters (9/7)
Multifunctional Support Brigades	20 Maneuver Enhancement Brigades (3/17) 17 Aviation Brigades (10/7) 12 Battlefield Surveillance Brigades (6/6) 15 Fires Brigades (8/7) 26 Multifunctional Sustainment Brigades (12/14)
Support Brigades	10 Air Defense Brigades (5/2) 3 Chemical Brigades (1/2) 13 Engineer Brigades (3/10) 11 Military Intelligence Brigades (10/1) 14 Signal Brigades (10/4) 10 Military Police Brigades (4/6) 2 Military Police Brigades (CID) (2/0) 4 Quartermaster Groups (Petroleum, Oil and Lubricants) (1/3) 3 Explosive Ordnance Disposal Groups (2/1) 12 Medical Brigades (3/9) 7 Theater Aviation Brigades (2/6) 9 Civil Affairs Brigades (1/8)
Theater Commands	3 Theater Air And Missile Defense Commands (2/1) 2 Theater Aviation Commands (0/2) 4 Civil Affairs Commands (0/4) 1 Support Command (CBRNE) (1/0) 2 Theater Engineer Commands (0/2) 10 Expeditionary Support Command (4/6) 2 Theater Military Police Commands (0/2) 3 Theater Signal Commands (2/2) 1 Information Operations Command (1/0) 4 Theater Medical Commands (2/2) 6 Theater Sustainment Commands (4/2) 5 Human Resources Sustainment Centers (3/2) 1 Army Network Operations Support Center (1/0) 6 Theater Network Operations Support Center (6/0) 8 Financial Management Centers (4/4) 1 Medical Logistics Management Center (1/0)

ARCENT. Under a Rising Peer strategy, CENTCOM’s focus shifts from promoting internal stability to denying terrorists safe havens. This effort still requires substantial U.S. forces, but allows for reallocating nine BCTs and the accompanying enablers from ARCENT. The most important of these enablers are three division headquarters, two of which will be eliminated entirely. The United States retains forces to develop local capacity, however, organized on current lines. The increasing maturity of U.S. Army

improvisations to support these efforts, combined with the assumption that similar efforts to develop a sizable force will not be required elsewhere under a Rising Peer strategy, obviate the necessity to create an “advisory corps” to support those efforts.

USARPAC. The Rising Peer strategy emphasizes air and naval capabilities. Although they are not the centerpiece of U.S. military capabilities in a direct confrontation with China, Army maneuver forces remain allocated to the PACOM area of responsibility as a hedge against a North Korean invasion to secure key installations or to cope with other potential difficulties. The Army will create three additional air defense artillery brigades to provide point and area defense for U.S. bases in the region.

USAREUR. The strategic center of gravity having shifted to the Pacific basin, the Army can reallocate three BCTs, a division headquarters and associated enablers from Europe.

FORSCOM. Of the twelve BCTs and three division headquarters reallocated from ARCENT and USAREUR, seven BCTs and a division headquarters will be released to FORSCOM for worldwide employment. The remainder will be eliminated.

Allocation of Forces by Combatant Command Under Alternative Strategies

The next several tables indicate the notional distribution of forces to each combatant command and associated Army service component command (ASCC) under each of the illustrative defense strategies. These distributions serve as the basis for comparison used to make the assessments described in Chapter 5. Table B.5 presents the baseline distribution under the Direct COIN strategy; Tables B.6 and B.7 depict the reallocation of forces from that strategy.

The notation differs from that in Chapter 3. In the tables below, the numbers in parentheses separated by a slash (“/”) indicate first the number in theater and second the number held at FORSCOM for eventual commitment to that theater. In Chapter 3, we used similar notation to differentiate active component from reserve component forces.

Table B.5: Baseline (Direct COIN) Allocation of Operational Army Units

Army Service Component Command	Units
ARCENT	1 Army Service Component Command 2 Corps Headquarters (1/1) 8 Division Headquarters (4/4) 1 Theater Air and Missile Defense Command 1 Theater Aviation Command 2 Civil Affairs Commands 1 Theater Engineering Command 4 Theater Expeditionary Sustainment Command (2/2) 1 Theater Medical Command 1 Theater Signal Command 1 Information Operations Command 1 Theater Sustainment Command 1 Human Resources Sustainment Center 1 Theater Networks Operation Center 1 Financial Management Center 39 Brigade Combat Teams (24/15) 8 Combat Aviation Brigades (4/4) 8 Battlefield Surveillance Brigade (4/4) 8 Fires Brigades (4/4) 8 Maneuver Enhancement Brigades (4/4) 8 Sustainment Brigades (4/4) 9 Engineer Brigades (3/6) 4 Air Defense Brigades (2/2) 2 Military Intelligence Brigade (1/1) 4 MP Brigades (2/2) 2 Signal Brigades (1/1) 1 Medical Brigade 2 Quartermaster Groups (1/1) 1 MP Brigade (CID) 1 EOD Group 2 Theater Aviation Brigade (1/1) 1 Chemical Brigade 3 Regional Support Groups
USARPAC	1 Army Service Component Command 1 Corps Headquarters 2 Division Headquarters 1 Air and Missile Defense Command 1 Theater Aviation Command 2 Expeditionary Sustainment Commands 1 Theater Signal Command 1 Theater Medical Command 1 Theater Sustainment Command 1 Human Resources Sustainment Center 1 Theater Network Operations Center (AC) 1 Financial Management Center 7 Brigade Combat Teams (4/3) 2 Combat Aviation Brigades 1 Battlefield Surveillance Brigade 2 Fires Brigades

Army Service Component Command	Units
	1 Maneuver Enhancement Brigades 2 Sustainment Brigades 2 Engineer Brigades 1 Air Defense Brigade 3 Military Intelligence Brigades 2 Signal Brigades 1 Medical Brigade 1 EOD Group 2 Theater Aviation Brigades (RC) 1 Chemical Brigade 5 Regional Support Groups
USAREUR	1 Army Service Component Command 1 Division Headquarters 1 Theater Air and Missile Defense Command 1 Expeditionary Support Command 1 Theater Signal Command 1 Theater Medical Command 1 Theater Sustainment Command 1 Human Resources Sustainment Command 1 Theater Network Operations Center 1 Financial Management Center 4 Brigade Combat Teams (1/3) 1 Combat Aviation Brigade 1 Multifunctional Sustainment Brigade 1 Engineer Brigade 1 Air Defense Brigade 2 Military Intelligence Brigades 1 Military Police Brigade 1 Signal Brigade 1 Medical Brigade 1 EOD Group 1 Theater Aviation Brigade 4 Regional Support Groups
USARAF	1 Army Service Component Command
USARSO	1 Army Service Component Command
ARNORTH	1 Army Service Component Command 2 Brigade Combat Teams (CBRNE Consequence Management Support Force, or C-CMSF) (0 AC/6 RC) 1 Theater Aviation Brigade
ARSTRAT	1 Army Service Component Command
FORSCOM	1 Army Command 1 Corps Headquarters 7 Division Headquarters 2 Civil Affairs Commands 1 Chemical, Biological, Radiological, Nuclear and high Explosive (CBRNE) Command 1 Engineer Command 6 Expeditionary Support Commands 1 Military Police Command 1 Theater Medical Command 2 Theater Sustainment Commands 2 Human Resource Support Centers

Army Service Component Command	Units
	1 National Ground Intelligence Center
	1 Army Network Operations Center
	3 Theater Network Operations Center
	3 Financial Management Centers
	1 Medical Logistics Management Center
	25 Brigade Combat Teams
	8 Combat Aviation Brigades
	1 Battlefield Surveillance Brigades
	14 Maneuver Enhancement Brigades
	3 Fires Brigades
	22 Multifunctional Sustainment Brigades
	1 Chemical Brigade
	4 Engineer Brigades
	1 Air Defense Brigade
	4 Military Intelligence Brigades
	5 Military Police Brigades
	5 Military Police Brigades
	7 Medical Brigades
	2 Quartermaster Groups
	1 Theater Aviation Brigade
	29 Regional Support Groups

**Table B.6:
Operational Army Force Shifts by Army Service Component Command Under a Build
Local Defend Global Strategy**

Army Service Component Command	Units
ARCENT	-8 (4/4) Brigade Combat Teams -2 (1/1) Division Headquarters +2 Combat Advisor Divisions -2 (1/1) Combat Aviation Brigades +1 (1/0) Theater Aviation Brigade (supporting Combat Advisor Divisions) -2 (1/1) Battlefield Surveillance Brigades -1 (1/0) Multifunctional Sustainment Brigades -2 (1/1) Fires Brigades -2 (1/1) Maneuver Enhancement Brigades -3 (1/2) Engineer Brigades
USARPAC	-3 (0/3) Brigade Combat Teams -1 (0/1) Division Headquarters -1 (0/1) Combat Aviation Brigade -1 (0/1) Fires Brigades -1 (0/1) Battlefield Surveillance Brigades -1 (0/1) Maneuver Enhancement Brigades
USAREUR	-2 (0/2) Brigade Combat Teams
USARAF	+1 (1/0) Theater Signal Command +1 (1/0) Theater Sustainment Command +1 (1/0) Theater Medical Command +1 (0/1) Civil Affairs Command +1 (0/1) Theater Aviation Brigade +1 (1/0; eventually 2) Combat Advisor Divisions
USASOC	+1 (1/0) Infantry Brigade Combat Teams (Ranger Regiment) +1 (1/0) Combat Aviation Brigade (160 th SOAR)
FORSCOM	-1 Theater Aviation Brigade

Table B.7: Operational Army Force Shifts by Combatant Command under a Rising Peer Strategy

Army Service Component Command	Units
ARCENT	-8 (4/4) Brigade Combat Teams -2 (1/1) Division Headquarters -2 (1/1) Battlefield Surveillance Brigades -1 (1/0) Multifunctional Sustainment Brigades -2 (1/1) Fires Brigades -2 (1/1) Maneuver Enhancement Brigades -3 (1/2) Engineer Brigades
USARPAC	+3 (3/0) Air Defense Artillery Brigades
USAREUR	-2 (0/2) Brigade Combat Teams
FORSCOM	+2 Battlefield Surveillance Brigades +2 Fires Brigades

Appendix C: Alignment of Army Budget Appropriations and SAGs with Generating Force Core Processes

Appropriation/ SAG Number	SAG Title	Generating Force Core Process Alignment
Military Personnel, Army (MPA) National Guard Personnel, Army (NGPA) Reserve Personnel, Army (RPA)		Mixed
Operations and Maintenance, Army (OMA) Operations and Maintenance, Army National Guard (OMNG) Operations and Maintenance, Army Reserve (OMAR)		See below
115	Land Forces Operations Support	Support Organizational Training
121	Force Readiness Operations Support	Support Organizational Training
122	Land Forces Systems Readiness	Develop Doctrine
123	Land Forces Depot Maintenance	Acquire, Maintain, and Sustain Equipment
131	Base Operations Support	Operate Installations
132	Sustainment, Restorations, and Modernization	Acquire and Sustain Infrastructure
133	Management and Operational Headquarters	Planning and Policy Development
134	Combatant Commands Core Operations	Joint
138	Combatant Command Direct Mission Support	Joint
211	Strategic Mobility	Tailor, Mobilize, and Project Landpower
212	Army Prepositioned Stocks	Tailor, Mobilize, and Project Landpower
213	Industrial Preparedness	Acquire, Maintain, and Sustain Equipment
311	Officer Acquisition	Identify and Develop Leaders
312	Recruit Training	Acquire, Train, and Sustain People
313	One Station Unit Training	Acquire, Train, and Sustain People
314	Senior Reserve Officer Training Corps (SROTC)	Identify and Develop Leaders
321	Specialized Skill Training	Acquire, Train, and Sustain People
322	Flight Training	Generating Force
332	Professional Development Education	Acquire, Train, and Sustain People
333	Off-Duty and Voluntary Education	Acquire, Train, and Sustain People
334	Civilian Education and Training	Identify and Develop Leaders
335	Junior Reserve Officer Training Corps	Acquire, Train, and Sustain People
411	Security Programs	Direction and Assessment
421	Servicewide Transportation	Maintain and Sustain Land Operations
422	Central Supply Activities	Maintain and Sustain Land Operations
423	Logistic Support Activities	Maintain and Sustain Land Operations
424	Ammunition Management	Maintain and Sustain Land Operations
431	Administration	Planning and Policy Development
432	Servicewide Communications	Information Management

Appropriation/ SAG Number	SAG Title	Generating Force Core Process Alignment
433	Manpower Management	Direction and Assessment
434	Other Personnel Support	Acquire, Train, and Sustain People
435	Other Service Support	Operate Installations
436	Army Claims	Acquire, Train, and Sustain People
437	Other Construction Support and Real Estate Management	Acquire and Sustain Infrastructure
438	Financial Improvement and Audit Readiness	Financial Management
441	International Military Headquarters	Joint
442	Miscellaneous Support of Other Nations	Acquire, Train, and Sustain People
RDT&E		Develop Requirements
Military Construction, Army (MCA) Military Construction, Army National Guard (MCNG) Military Construction, Army Reserve (MCAR)		Acquire and maintain Infrastructure

Appendix D: Budget Data Used in Model Development

We used data from publically available documents, the annual *Green Books* published by the Office of the Under Secretary of Defense (Comptroller) and Army budget materials to develop our generating fore models. Where possible, we developed those models by correlating expenditures with cost drivers like the number of brigade combat teams deployed, casualties and so forth that served as proxies for our qualitative variables. In the interests of transparency, we present those data in this appendix. Obviously, Army planners already have access to these and even better data.

Budget Data

Table D.1: Army Budget Data for Select Appropriations and Sub-Activity Groups, FY 1997–2010 (Constant FY 2010 Dollars)

SAG	SAG Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
OMA	Operations and Maintenance, Army														
111-114, 116	Operational Army Forces	2.971	2.571	2.617	2.760	3.330	3.569	3.535	3.615	3.825	2.816	2.237	3.222	3.366	2.830
115	Land Forces Operations Support	1.227	0.974	1.117	1.120	1.142	1.132	1.674	1.128	1.162	1.034	1.089	1.132	1.240	1.104
121	Force Readiness Operations Support	1.133	1.621	1.778	1.781	1.499	1.671	2.762	2.073	2.032	1.963	3.574	3.453	1.561	2.413
122	Land Forces Systems Readiness	0.656	0.547	0.554	0.758	0.768	0.647	1.295	0.700	0.605	0.545	0.546	0.528	0.646	0.622
123	Land Forces Depot Maintenance	1.080	1.059	0.879	0.944	0.955	0.959	1.462	2.405	3.005	3.648	0.752	0.726	0.711	0.661
131	Base Operations Support	7.224	6.412	6.509	7.296	7.491	7.779	9.462	7.153	7.095	7.118	7.307	7.060	7.317	9.064
132	Facilities Sustainment, Restoration, & Modernization	1.690	1.813	1.864	2.231	2.263	2.188	1.707	1.484	1.676	2.414	1.929	1.864	2.604	2.236
133	Management And Operational Hq	0.323	0.230	0.209	0.219	0.243	0.317	0.299	0.278	0.263	0.305	0.270	0.261	0.294	0.329
134	Combatant Commanders Core Operations	0.230	0.094	0.122	0.126	0.106	0.115	0.135	0.127	0.135	0.114	0.106	0.102	0.199	0.155
135	Additional Activities	2.052	2.468	3.959	3.560	2.767	4.056	18.447	33.974	35.324	35.654	27.780	26.840	40.740	43.207
137	Reset	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.245	3.262	5.169	8.770	7.879	7.370	6.545
211	Strategic Mobility	0.475	0.454	0.452	0.475	0.464	0.492	0.521	0.311	0.296	0.246	0.168	0.162	0.194	0.237
212	Army Prepositioning Stocks	0.129	0.215	0.215	0.248	0.147	0.184	0.374	0.325	0.169	0.110	0.070	0.067	0.124	0.084
213	Industrial Preparedness	0.088	0.079	0.083	0.071	0.101	0.079	0.233	0.009	0.018	0.021	0.005	0.005	0.002	0.006
311	Officer Acquisition	0.097	0.091	0.100	0.107	0.106	0.105	0.108	0.117	0.115	0.119	0.132	0.120	0.138	0.136
312	Recruit Training	0.020	0.021	0.029	0.020	0.027	0.025	0.025	0.072	0.032	0.039	0.040	0.046	0.080	0.058

SAG	SAG Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
313	One Station Unit Training	0.022	0.018	0.017	0.019	0.024	0.027	0.037	0.067	0.044	0.051	0.048	0.047	0.046	0.031
314	Senior Reserve Officers Training Corps	0.174	0.168	0.211	0.223	0.216	0.242	0.260	0.252	0.256	0.252	0.261	0.372	0.453	0.490
321	Specialized Skill Training	0.344	0.330	0.326	0.356	0.387	0.408	0.521	0.524	0.509	0.573	0.509	0.721	0.920	0.930
322	Flight Training	0.328	0.300	0.353	0.366	0.426	0.569	0.584	0.670	0.606	0.554	0.581	0.735	0.815	0.972
323	Professional Development Education	0.116	0.113	0.127	0.133	0.137	0.151	0.087	0.110	0.125	0.119	0.107	0.106	0.178	0.160
324	Training Support	0.598	0.704	0.567	0.603	0.608	0.668	0.698	0.696	0.649	0.568	0.601	0.589	0.721	0.689
331	Recruiting And Advertising	0.375	0.367	0.398	0.544	0.519	0.580	0.593	0.548	0.599	0.638	0.514	0.567	0.571	0.543
332	Examining	0.110	0.101	0.101	0.108	0.104	0.098	0.101	0.127	0.151	0.147	0.122	0.145	0.161	0.159
333	Off-Duty And Voluntary Education	0.169	0.166	0.156	0.127	0.188	0.235	0.292	0.299	0.283	0.193	0.254	0.212	0.230	0.241
334	Civilian Education And Training	0.114	0.109	0.101	0.100	0.098	0.105	0.117	0.157	0.171	0.154	0.155	0.185	0.202	0.214
335	Junior ROTC	0.103	0.106	0.104	0.115	0.112	0.119	0.121	0.151	0.154	0.134	0.142	0.150	0.149	0.149
411	Security Programs	0.539	0.541	0.633	0.632	0.684	0.748	1.173	1.101	1.088	1.560	1.171	2.110	2.204	2.588
421	Servicewide Transportation	0.816	0.784	0.610	0.782	0.667	0.893	1.380	1.841	1.448	2.163	1.192	3.889	3.313	5.244
422	Central Supply Activities	0.591	0.516	0.498	0.535	0.586	0.594	0.763	0.578	0.565	0.444	0.434	0.542	0.638	0.608
423	Logistic Support Activities	0.587	0.480	0.544	0.497	0.389	0.876	2.206	0.583	0.487	0.493	0.441	0.527	0.496	0.491
424	Ammunition Management	0.495	0.444	0.508	0.492	0.473	0.506	0.809	0.457	0.406	0.387	0.295	0.383	0.450	0.358
431	Administration	0.453	0.432	0.678	0.395	0.940	1.056	1.378	1.481	1.726	1.193	0.643	1.406	1.036	1.161
432	Servicewide Communications	0.962	0.877	0.930	0.934	0.707	0.696	0.982	0.809	0.826	0.979	0.911	1.076	1.230	1.411
433	Manpower Management	0.230	0.211	0.222	0.225	0.214	0.199	0.268	0.265	0.294	0.296	0.285	0.307	0.336	0.379
434	Other Personnel Support	0.302	0.261	0.269	0.251	0.313	0.302	0.339	0.274	0.286	0.265	0.196	0.257	0.229	0.292
435	Other Service Support	1.676	1.903	1.897	1.825	1.606	1.562	1.692	1.827	1.607	1.564	0.787	1.528	1.865	1.832
436	Army Claims Activities	0.169	0.173	0.141	0.164	0.149	0.134	0.119	0.105	0.096	0.209	0.196	0.184	0.189	0.214
437	Real Estate Management	0.133	0.094	0.094	0.099	0.083	0.077	0.070	0.066	0.066	0.050	0.047	0.046	0.060	0.128
441	Support Of NATO Operations	0.352	0.359	0.352	0.355	0.288	0.278	0.301	0.342	0.350	0.356	0.324	0.371	0.416	0.425
442	Misc. Support Of Other Nations	0.057	0.053	0.057	0.061	0.067	0.067	0.067	0.069	0.069	0.050	0.043	0.044	0.025	0.014
OMAR															
111-116	Operational Army Units	0.366	0.365	0.387	0.443	0.448	0.501	0.656	0.593	0.540	1.015	1.089	1.301	1.357	1.175

SAG	SAG Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
121	Force Readiness Operations Support	0.173	0.171	0.195	0.183	0.184	0.198	0.171	0.206	0.200	0.204	0.222	0.228	0.277	0.323
122	Land Forces Systems Readiness	0.061	0.055	0.044	0.045	0.063	0.078	0.121	0.079	0.078	0.079	0.102	0.137	0.131	0.108
123	Land Forces Depot Maintenance	0.071	0.059	0.066	0.049	0.062	0.076	0.060	0.076	0.080	0.101	0.138	0.158	0.097	0.122
131	Base Operations Support	0.377	0.440	0.420	0.438	0.475	0.506	0.571	0.489	0.512	0.555	0.557	0.582	0.588	0.519
132	Facilities Sustainment, Restoration, & Modernization	0.105	0.135	0.097	0.182	0.174	0.194	0.235	0.170	0.152	0.165	0.230	0.227	0.242	0.208
135	Additional Activities	0.001	0.005	0.002	0.003	0.002	0.004	0.003	0.004	0.005	0.005	0.009	0.010	0.012	0.234
421	Servicewide Transportation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
431	Administration	0.051	0.042	0.047	0.049	0.050	0.058	0.057	0.059	0.064	0.063	0.063	0.069	0.076	0.075
432	Servicewide Communications	0.046	0.043	0.044	0.038	0.030	0.039	0.050	0.047	0.011	0.011	0.009	0.011	0.006	0.004
433	Manpower Management	0.073	0.071	0.065	0.063	0.062	0.061	0.062	0.060	0.009	0.009	0.008	0.009	0.009	0.017
434	Recruiting And Advertising	0.069	0.060	0.090	0.117	0.111	0.115	0.116	0.123	0.126	0.128	0.105	0.073	0.052	0.056
OMNG															
111-114,116	Maneuver Units	0.000	1.830	1.943	1.931	1.870	1.944	2.456	2.436	2.303	2.270	2.520	2.521	2.561	2.379
115	Land Forces Operations Support	0.000	0.086	0.116	0.090	0.053	0.055	0.095	0.040	0.037	0.038	0.026	0.045	0.052	0.080
121	Force Readiness Operations Support	0.000	0.001	0.001	0.000	0.000	0.154	0.130	0.187	0.213	0.248	0.252	0.295	0.380	0.501
122	Land Forces Systems Readiness	0.000	0.142	0.172	0.007	0.111	0.195	0.240	0.166	0.174	0.141	0.156	0.119	0.125	0.131
123	Land Forces Depot Maintenance	0.000	0.000	0.000	0.262	0.229	0.241	0.212	0.229	0.258	0.272	0.375	0.412	0.323	0.336
131	Base Operations Support	0.000	0.503	0.634	0.762	0.757	0.757	0.890	0.867	0.923	0.927	0.795	1.095	0.942	0.940
132	Facilities Sustainment, Restoration, & Modernization	0.000	0.180	0.199	0.282	0.321	0.331	0.398	0.384	0.349	0.446	0.413	0.468	0.468	0.532
133	Management And Operational Hq	0.000	0.471	0.579	0.793	0.834	0.784	0.573	0.538	0.670	0.549	0.423	0.601	0.699	0.790
135	Additional Activities	0.000	0.000	0.000	0.000	0.052	0.056	0.060	0.092	0.118	0.109	0.116	0.925	0.555	0.453
421	Servicewide Transportation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SAG	SAG Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
431	Administration	0.000	0.045	0.064	0.117	0.124	0.136	0.143	0.148	0.120	0.121	0.143	0.145	0.122	0.110
432	Servicewide Communications	0.000	0.087	0.065	0.033	0.028	0.019	0.030	0.030	0.046	0.064	0.058	0.055	0.048	0.044
433	Manpower Management	0.000	0.143	0.097	0.048	0.053	0.054	0.043	0.053	0.081	0.110	0.057	0.009	0.009	0.007
434	Recruiting And Advertising	0.000	0.052	0.063	0.086	0.116	0.109	0.132	0.192	0.252	0.392	0.135	0.371	0.273	0.416
RDTE	RDTE	7.385	7.294	7.114	7.374	8.340	9.056	9.425	12.243	12.005	12.693	11.911	12.917	12.389	11.711
MCA	Military Construction, Army														
	Operation Enduring Freedom	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.549	0.313	0.762	1.117
	Operation Iraqi Freedom	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.141	0.000	0.055	0.292	0.407	0.000	0.000
	Domestic Military Construction	0.000	0.000	0.000	1.685	1.221	2.383	1.805	1.774	4.110	2.451	2.265	4.688	6.229	4.221
	Other Overseas Construction	0.000	0.000	0.000	0.038	0.476	0.644	0.713	0.502	0.942	0.617	1.124	0.879	0.578	0.273
	TOTAL MILITARY CONSTRUCTION	0.873	1.025	1.396	1.723	1.697	3.027	2.518	2.417	5.052	3.123	4.229	6.287	7.569	5.610
AFH/AFO	Army Family Housing	1.998	1.864	1.747	1.599	1.563	0.404	1.590	1.717	1.778	1.468	1.402	1.184	1.383	0.712
MCNG	Military Construction, Army National Guard	0.117	0.177	0.205	0.328	0.379	0.517	0.300	0.375	0.508	1.213	0.504	0.553	0.900	0.582
MCAR	Military Construction, Army	0.084	0.107	0.144	0.154	0.145	0.213	0.126	0.106	0.115	0.165	0.177	0.152	0.288	0.432

Workload Data

We compiled workload data from a variety of sources. Once again, our most consistently useful and reliable source of data were Army budget justification documents, particularly those associated with supplemental or Overseas Contingency Operation (OCO) requests. Those documents provide an official estimate of the major force deployed, the personnel deployed, and so forth. We also extracted information on mobilization and casualties from the website of the Defense Manpower Data Center's (DMDC's) Statistical Information and Analysis Division (SIAD) website (<http://siadapp.dmdc.osd.mil/personnel/MMIDHOME.HTM>). We limited this workload data to the period of the current conflict, from FY 2002 to FY 2010.

Table D.2: Potential Generating Force Workload Factors, FY 2002–2010

Fiscal Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Soldiers deployed to OEF (1,000s)	5.2	10.4	15.2	15.0	16.9	18.5	21.2	33.5	56.7
Soldiers deployed to OIF/OND (1,000s)	0.0	143.9	129.0	125.8	116.4	121.3	122.6	112.9	84.0
Soldiers deployed to SFOR (1,000s)	4.3	3.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0
Soldiers deployed to KFOR (1,000s)	2.8	1.5	1.7	1.8	1.8	1.4	1.0	1.0	1.0
BCTs deployed to OEF	1	1	2	2	3	4	3	5	8
BCTs deployed to OIF/OND			17	17	14	18	22	16	11
Total BCTs deployed to OEF and OIF/OND	1	1	19	19	17	22	25	21	19
Total soldiers deployed	12.3	158.8	147.4	143.6	135	141.2	144.8	147.3	141.8
Actual AC endstrength	486,543	499,301	499,543	492,728	505,402	522,017	543,645	552,465	566,045
Average on-active-duty strength	508,928	590,060	616,323	614,800	582,978	587,032	608,016	641,774	650,441
Average USAR endstrength	194,259	195,087	196,196	196,088	188,255	188,936	194,137	203,354	207,080
Average ARNG endstrength	350,820	348,214	345,096	333,462	343,465	349,536	360,864	363,621	360,864
Average Reserve Component endstrength	545,079	543,301	541,292	529,550	531,720	538,472	555,001	566,975	567,944
Grow The Army Initiative under way (Dummy)	0	0	0	0	0	1	1	1	1
Total Army size (1,000s)	1,031.6	1,042.6	1,040.8	1,022.3	1,037.1	1,060.5	1,098.6	1,119.4	1,134.0
Total soldiers deployed (1,000s)	5.2	154.3	144.2	140.8	133.2	139.8	143.8	146.3	140.8
OIF WIA	0	2416	8005	5944	6412	6112	2051	677	389
OIF KIA	0	486	849	846	822	904	314	149	60
Total OIF casualties	0	2,902	8,854	6,790	7,234	7,016	2,365	826	449
OEF KIA	49 ^a	48	52	99	98	117	155	312	499
OEF WIA	96	76	207	265	325	648	900	1,661	4,392
Total OEF casualties	145	124	259	364	423	765	1,055	1,973	4,891
Total U.S. KIA	49	534	901	945	920	1021	469	461	559
Total U.S. WIA	96	2,492	8,212	6,209	6,737	6,760	2,951	2,338	4,781

Fiscal Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total U.S. casualties	145	3,026	9,113	7,154	7,657	7,781	3,420	2,799	5,340
Total RC mobilized	22,385	90,759	116,780	122,072	77,576	65,015	64,371	89,309	84,396
Total ARNG mobilized	18,102	71,027	87,997	100,251	67,962	49,534	54,208	62,786	60,300
Total USAR mobilized	10,203	49,129	46,542	39,963	29,953	24,078	26,638	23,235	23,550

^aIncludes casualties suffered in Southwest Asia. Obviously, these cannot be attributed to OIF per se.

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