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CBO STUDY

SEPTEMBER 2000

Budgeting for Defense: Maintaining Today's Forces



**Cold
War**

**Current
Strategy
and Forces**

**Regional
Command**

Operational

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**BUDGETING FOR DEFENSE:
MAINTAINING TODAY'S FORCES**

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Congressional Budget Office

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NOTES

Unless otherwise indicated, all years referred to in this study are fiscal years, and all values are in 2000 dollars of budget authority.

Data on forces and military personnel are drawn from 1999, the last completed fiscal year.

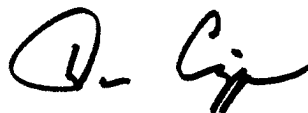
Numbers in the text and tables may not add up to totals because of rounding.

Preface

Funding for national defense is a major issue that the 107th Congress will consider. With a new Administration—and possibly a new national security strategy—in place, the size and shape of U.S. forces and the budget needed to maintain them are likely to be a focus of that debate. This Congressional Budget Office (CBO) study, which was prepared for the Senate Committee on the Budget, presents CBO's estimate of the cost of sustaining today's military forces. In keeping with CBO's mandate to provide objective, impartial analysis, the study contains no recommendations.

Lane Pierrot of CBO's National Security Division (NSD) wrote the study with assistance from Evan Christman and Billy Trimble. Jo Ann Vines of CBO's Budget Analysis Division (BAD) wrote the section on procurement costs and together with colleagues Raymond Hall and Dawn Regan developed many of the cost estimates for the sustaining budget. The analysis was performed under the general supervision of Christopher Jehn and R. William Thomas of NSD and Michael A. Miller of BAD. Barry Anderson, Bruce Arnold, Deborah Clay-Mendez, Arlene Holen, and Steve Lieberman of CBO and Sean O'Keefe of the Maxwell School at Syracuse University provided helpful comments. CBO's Russ Beland, Eric Labs, Rachel Schmidt, and Laurinda Zeman analyzed portions of the defense budget. John Cadigan, Delia Welsh, and Anne Dupree, formerly of CBO, also made important contributions.

Leah Mazade edited the study, and Christian Spoor proofread it. Cynthia Cleveland typed the many drafts with speed and precision. Kathryn Quattrone prepared the report for publication. Annette Kalicki prepared the electronic versions for CBO's Web site. Barry Anderson designed the cover.



Dan L. Crippen
Director

September 2000

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Summary

The budget request for national defense that the 107th Congress will consider in 2001 will be the first submitted by a new Administration in eight years. That Administration could put forth new strategies or programs that would change the funding needed to maintain national security. As the Congress considers that budget, three questions should be prominent:

- o Is the new Administration's national security strategy an appropriate response to likely threats to U.S. security?
- o Will the military forces and modernization programs that the Department of Defense (DoD) plans adequately support that strategy?
- o Will the budget that the Administration proposes be sufficient to maintain those forces and carry out those plans?

All three of those questions are appropriate for evaluating the nation's military forces and the funding that is necessary to maintain them. But this Congressional Budget Office (CBO) study focuses only on the last question and attempts to provide a context or reference point for answering it.

A full examination of either the current threats to U.S. security or the adequacy of the strategy that has been developed to counter those threats is beyond the scope of this analysis. Accordingly, the discussion

treats threats and strategy only briefly to provide some background for CBO's analysis of today's military forces and their funding. Further, this study does not address the cost of the broad array of alternative strategies that might be pursued in the future. Instead, as a starting point for such an analysis, it discusses the cost of a "sustaining" budget for today's national defense structure—that is, the annual funding CBO estimates is needed to maintain today's forces into the future and to modernize them. The study also describes several options for closing the gap between current appropriations for defense and CBO's estimate of sustaining funding.

Threats

The U.S. military today has no peer. In number, certain Russian and Chinese conventional (mostly non-nuclear) weapons and forces may equal and, in a few cases, exceed those of the United States. But the capabilities of the U.S. military far surpass those of other nations once such factors as training, readiness for combat, sophistication of weapons, and availability of linked communications and intelligence networks are taken into account.

Nevertheless, certain regional powers around the world are antagonistic to U.S. interests and pose threats that are the focus of much of today's defense planning. Iran, Iraq, and North Korea are the nations

of most concern, although they have substantially fewer forces than either Russia or China, let alone the United States. Their forces are also no match for U.S. troops and equipment in many of the other dimensions of combat capability noted above.

But most worrisome, according to the intelligence community and many military leaders, may be unconventional threats—for example, nuclear, biological, and chemical (NBC) weapons, many of which have enormous destructive capacity. The regional powers of concern to U.S. defense analysts may be developing or expanding their stocks of such weapons. Moreover, threats to use unconventional weapons could come from individuals or hostile groups as well as other nation states. Adversaries could also target the Internet and seek to disrupt commercial and military computer networks on which the United States and DoD increasingly rely. Such threats are difficult to counter, in part because most current U.S. weapons are focused on more conventional threats. Moreover, the nation's superior conventional forces and weapons would be of limited value in a regional war if an enemy's threat of retaliation with NBC weapons deterred the United States from using its conventional arms.

Strategy

The current national security strategy rests on a policy of engagement in the world's affairs, not only during crises but in peacetime as well. Consequently, the strategy directs the U.S. military to be ready to undertake activities ranging from limited humanitarian missions to full military campaigns against capable, well-equipped regional adversaries.

The makeup of today's combat forces is driven by a goal of being ready to fight two regional campaigns occurring at about the same time. That objective determines the size and structure of most types of forces. But the current national security strategy has also expanded the U.S. military's peacetime activities—what CBO refers to in this study as peace operations—compared with past periods. (Peace operations include peacekeeping, humanitarian assistance, hostage rescue, and peace enforcement.) That part of the strategy has affected forces as well, adding to the mili-

tary's operating costs in peacetime and increasing the demands on military personnel—not only from additional activities but also from the greater need for forces specifically associated with peace missions, such as civil affairs personnel and military police.

Another factor that affects U.S. military actions and budgets is the desire of decisionmakers to minimize casualties, a desire that has increased over the past several decades. That attitude may affect the nature of the forces that are used—for example, air rather than ground forces. It may also lead to increases in the number of forces DoD maintains, because, the military argues, greater U.S. superiority can shorten wars and reduce U.S. casualties.

In addition to meeting current demands, the services are directed by the national security strategy to prepare for the demands of the future. The plans that DoD develops for that purpose attempt to consider the evolution of military technology, the proliferation of more-sophisticated weapons—including weapons of mass destruction and the means to deliver them—and the possible emergence in the future of a nation with military capabilities that rival those of the United States. The military has used those considerations to justify its plans for modernization and its development and procurement of new weapons.

What Factors Drive Budget Requests for Defense?

Several major factors determine the resources needed to support today's military forces. Factors that influence DoD's annual operating costs—specifically the number, type, and readiness of its forces—are particularly important. (The costs associated with readiness, however, are difficult to pinpoint, in part because funding is dispersed among a number of budget categories; moreover, DoD's measures of readiness have serious limitations.) Another major determinant is the future capability that DoD requires in its forces, which guides the military's investment in modernization (specifically, the development and procurement of weapons, equipment, and facilities). The costs of supporting DoD's infrastructure, including military construc-

Summary Table 1.
U.S. Military Forces in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999
Strategic Forces^a					
Land-Based ICBMs	1,000	787	580	550	-45
Heavy Bombers ^b	310	194	126	143	-54
Submarine-Launched Ballistic Missiles	576	408	408	432	-25
Conventional Forces^c					
Land Forces					
Army divisions ^d					
Active	18	14	10	10	-44
Reserve	10	8	8	8	-20
Marine Corps expeditionary forces ^e					
Active	3	3	3	3	0
Reserve	1	1	1	1	0
Naval Forces					
Battle force ships ^f	566	435	354	317	-44
Aircraft carriers					
Active	15	13	11	11	-27
Reserve	1	0	1	1	0
Navy carrier air wings					
Active	13	11	10	10	-23
Reserve	2	2	1	1	-50
Air Forces					
Tactical fighter wings					
Active	25	16	13	13	-48
Reserve	12	11	8	8	-33
Airlift aircraft					
Intertheater	401	382	345	331	-17
Intratheater	468	380	430	425	-9

SOURCE: Congressional Budget Office using data from Office of the Secretary of Defense, *Annual Report to the President and the Congress* (various years).

NOTE: ICBMs = intercontinental ballistic missiles.

- a. Forces with basically nuclear missions.
- b. Includes some long-range bombers that do not have strategic missions.
- c. Forces with largely nonnuclear missions.
- d. Excludes separate brigades that are not part of a division.
- e. A Marine expeditionary force includes a division, an air wing, and supporting forces for those combat elements.
- f. Includes all Navy ships involved in combat—for example, ballistic missile submarines, surface combat ships, aircraft carriers, and amphibious craft—as well as some other vessels.

tion and family housing, also add to budgetary requirements.

The size and structure of U.S. conventional forces largely determine the military's operating costs and hence its budget requests. Metrics used for those factors typically include divisions (the Army and the Marine Corps); tactical air wings (the Air Force, Marine Corps, and Navy); and ships (the Navy). Today's Army includes 10 active-duty divisions, and each typically has three brigades. Another eight divisions and 18 separate brigades make up the Army National

Guard. The Navy operates more than 300 battle force ships (essentially all ships involved in combat plus some others). The Marine Corps is organized into three active divisions and three Marine air wings; another division and air wing make up the Marine Corps Reserve. Finally, the Air Force operates the equivalent of about 20 tactical fighter wings—12.6 in the active component of the service and 7.6 in the Air National Guard and Air Force Reserve. (Summary Table 1 lists today's forces and compares them with those of previous years. Summary Table 2 shows how budgets have changed along with force structures.)

Summary Table 2.

Funding for National Defense and Personnel for the Department of Defense in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999 ^a
Budget Authority (In billions of 2000 dollars)					
Department of Defense					
Military personnel	109	93	78	73	-33
Operation and maintenance	116	99	99	109	-6
Procurement	97	58	44	52	-47
Research, development, test, and evaluation	47	42	38	39	-17
Military construction	7	5	6	6	-20
Family housing	4	4	4	4	-11
Subtotal	380	302	269	282	-26
Other Agencies ^b	11	16	13	14	23
Total, National Defense ^c	391	318	282	296	-24
DoD Personnel (In thousands)^d					
Active Duty	2,130	1,705	1,439	1,386	-35
National Guard and Reserve	1,171	1,058	902	869	-26
Civilian	1,107	984	786	704	-36

SOURCE: Congressional Budget Office using data from the Department of Defense and the Office of Management and Budget.

- The apparent discrepancies in CBO's calculations arise from rounding.
- Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
- Includes revolving and management funds, trust funds, and offsetting receipts. Excludes contract authority for the working capital funds because appropriations are used to liquidate that authority.
- Strength measured at the end of the year.

CBO did not analyze whether those forces are sufficient to support the national security strategy, although that issue has been a matter of some contention. Defense analysts have criticized force levels as either too high or too low, or the mix of units as wrong, for the missions that the U.S. military is expected to accomplish, both today and in the future. Such criticisms suggest that the levels and structure of those forces may change and that questions about their sufficiency will be a topic of upcoming debates about defense. In its analysis, however, CBO accepted the nation's military forces as they are sized and structured today and estimated the annual budget that would be necessary to sustain and modernize them.

CBO's Estimate of a Sustaining Budget for National Defense

CBO's estimate of a sustaining budget for national defense totals about \$340 billion in 2000 dollars. That amount represents the overall funding required to keep defense forces in a "steady state," which CBO calculated by holding constant certain factors, including the numbers of personnel, forces, and military bases. It is not an estimate of the defense budget for any specific year, although CBO has organized the components of the estimate in traditional budget categories (see Summary Table 3). In budgetary terms, the estimate covers budget function 050, which includes not only funding for the Department of Defense but also budget authority for defense activities related to atomic energy in the Department of Energy and for national defense functions in other federal agencies.

More specifically, CBO's estimate of sustaining funding for DoD's portion of the defense budget includes funds to:

- o Keep increases in the pay of military personnel consistent with increases in pay in the private sector;
- o Maintain current operating tempos (the pace of operations and training) and levels of maintenance and support for today's forces, and keep

increases in pay for DoD's civilian workforce in line with those in the private sector;

- o Replace the military's weapons and equipment at a rate consistent with projections of their service lives—in particular, replace old weapons and equipment with new systems that exist or are planned, or with items in DoD's current inventory where no new system is in development;
- o Provide funding for the research, development, test, and evaluation category consistent with the historical share of the budget that has been devoted to those activities; and
- o Repair and replace the existing stock of military facilities and family housing units.

Most of the sustaining budget—\$327 billion—would fund DoD; about \$13 billion would support the defense programs in other agencies. Activities in the Department of Energy would account for \$12 billion of the non-DoD funds, and the remaining \$1 billion would be dispersed among a variety of other agencies.

Sensitivities and Uncertainties of CBO's Estimate

The assumptions CBO made in estimating a sustaining budget for national defense were based on the best available information about current forces and trends. Like most estimates, CBO's is sensitive to (would be affected by) changes in some of those assumptions.

For example, a different force structure would not only alter appropriations for the pay and benefits of military personnel but also change the funding required for both operating costs and modernization. And even if the number and structure of forces remained the same, the estimate would still be sensitive to changes in other assumptions.

CBO's sustaining estimate of operating costs, for example, rests on an assumption about how much the pay of military personnel and DoD's civilian workforce would need to grow in real (inflation-adjusted) terms over a particular period to remain competitive with the pay of private-sector workers. That estimate

would be higher or lower depending on whether pay in the private sector grew faster or more slowly than CBO's projection. And if the labor market for young adults tightens further or even remains as challenging for military recruitment and retention as it is today, the costs of labor (military pay and benefits) could rise faster than the costs of other aspects of support for the military.

CBO's estimate of sustaining funding for procurement (\$90 billion) is particularly sensitive to changes in some of its components. Alternative assumptions about some portions of that estimate could add to or reduce it by tens of billions of dollars. For example, a major assumption involved the service lives of weapon systems and equipment. CBO used

service-life projections that are consistent with those that the military services use for their planning, which are much longer than the projections used in the past (because DoD is now keeping some equipment in service longer). But if CBO based its estimate on DoD's previous experience in retiring equipment, its estimate of sustaining funding for procurement would be \$25 billion higher.

Conversely, that estimate would be lower under an assumption that weapon systems and other equipment would be replaced on some other basis than one for one. The services might choose a different replacement policy in the future for a variety of reasons, as an example involving the Navy suggests. The service has cut the number of fighter aircraft in its carrier

Summary Table 3.

Fiscal Year 2000 Appropriations for National Defense and CBO's Estimate of a Sustaining Defense Budget, by Budget Category (In billions of 2000 dollars of budget authority)

	Appropriation for Fiscal Year 2000 ^a	Sustaining- Budget Estimate ^b
Department of Defense (Budget subfunction 051)		
Military personnel	74	82
Operation and maintenance	102	107
Procurement	53	90
Research, development, test, and evaluation	38	40
Military construction	5	5
Family housing	4	4
Subtotal	276	327
Other Agencies (Budget subfunctions 053 and 054) ^c	13	13
Total, National Defense (Budget function 050) ^d	289	340

SOURCE: Congressional Budget Office.

NOTE: The figures in the table include both discretionary and mandatory funding.

- a. Based on CBO's estimates as of July 2000 but excluding supplemental appropriations of about \$9 billion.
- b. The sustaining-budget estimate is CBO's calculation of the annual funding required to maintain U.S. military forces at their current size; to modernize their weapons and equipment at a rate that is consistent with expected service lives and with maintaining a technological advantage over potential adversaries; and to maintain current funding for readiness. It is a steady-state concept and not an estimate of the defense budget for any specific year.
- c. Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
- d. Includes revolving and management funds, trust funds, and offsetting receipts, which total less than \$0.5 billion. Excludes contract authority for the working capital funds because appropriations are used to liquidate that authority.

wings by about 20 percent from the levels it maintained during the Cold War. Such cuts might reflect changes in the threats faced by the carrier wings and in their missions. But they might also reflect the Navy's view that it could provide sufficient capability with fewer planes if those planes were more capable.

The Limitations of CBO's Estimate

In addition to the uncertainties noted above, CBO's estimate of a sustaining budget for national defense has several limitations that affect its usefulness. The estimate does not apply to the period for which DoD typically constructs detailed plans; in addition, as noted earlier, it is not an estimate of the defense budget for any specific year. The estimate is also a broad one, based on total defense appropriations and simple estimating methods. Consequently, it is not comparable to the detailed cost estimates that CBO prepares for legislation.

A more fundamental limitation of CBO's estimate is that it is not a calculation of the funding required to defend the nation's security interests. Such an estimate would require a full evaluation of the national security strategy and the military capabilities required to support it in light of the threats that the United States could confront. A new strategy could deemphasize, revise, or replace any of DoD's and the Administration's goals. Changes in the assumptions DoD now uses for planning—such as maintaining enough forces to fight two regional wars that occur at about the same time—would change the forces that the military required and therefore the funding it would need for both the operations and modernization of those forces. Likewise, fewer peace operations and deployments overseas could reduce the operating funds that the military required and might even justify cuts in the number of forces it would need.

Alternatives for Defense Forces and Budgets

To broaden the discussion, CBO's study includes a number of illustrative options showing how changes to

the military's force structure, modernization plans, or operations might affect the funding that the services require to maintain their forces. Some of the options would change specific force elements or particular programs; others would alter DoD's business operations or the way it runs its military bases. CBO drew specific alternatives from its March 2000 publication *Budget Options for National Defense*. The options are not intended to be recommendations but are merely examples that indicate the rough size of the savings such changes might produce. Average annual savings under the options would range from \$0.5 billion (for canceling the Army's Comanche helicopter) to \$3.8 billion (for canceling the F-22 fighter plane).

In addition to those options, CBO constructed two broad force structures to illustrate the budgetary effects of changing the focus of some of the military's missions. The first alternative emphasizes peace operations and deemphasizes combat missions. It would cut conventional combat forces, such as Army divisions, yet preserve most maritime forces and units that have been heavily used in recent peace operations, such as some support forces and airlift aircraft. Sustaining the forces in that option would require an annual budget of about \$320 billion (in 2000 dollars), CBO estimates, or about \$20 billion less than the sustaining budget associated with today's forces.

The second of CBO's alternative force structures stresses regional combat and conventional forces rather than peace missions but would cut purchases of newly developed equipment. According to CBO's calculations, the forces under the second option would require about \$325 billion (in 2000 dollars) to sustain them.

Conclusion

The questions noted at the beginning of this summary provide a context for considering the defense budget request and the military forces and activities it funds. CBO's analysis, however, addressed only the budget required to sustain the military forces that are in place today and not the issues those questions raise about threats, strategy, and the sufficiency of forces.

CBO's estimate of a sustaining budget is higher than any recent year's funding for national defense. To eliminate that imbalance, decisionmakers could change what they require from the military services, increase funding, or pursue some combination of those approaches. But even under the broad options that CBO evaluated for closing that gap, its estimate of a sustaining budget would still be higher than today's level of defense funding.

The large disparity between current defense budgets and CBO's estimate indicates the complexity of

the problem that decisionmakers face. To fully address that problem, they would need to consider all three of the questions posed earlier, which would involve a thorough review of possible threats to the nation's security (both now and in the future), the appropriate strategy to counter them, and the budgetary implications of decisions about those matters—a process that could lead to changes in forces, levels of readiness, and plans for modernization. Without that review, the appropriate level of budgetary support for national defense cannot be determined.

Introduction

With the end of the Cold War, strategic balances worldwide shifted radically, and the threats faced by the United States diminished. The collapse of the Warsaw Pact and the dismantling of the Soviet Union left the world looking different from the way it did when the Soviets dominated much of Asia and Eastern Europe. In response to those shifts, U.S. military forces have also undergone profound changes. The missions for which they train and plan have been substantially altered. And their numbers have been greatly reduced.

Throughout much of the 1990s, the funds U.S. policymakers allocated to national defense followed a similar downward trend, as budgets fell along with forces (see Table 1). In 1998, the defense budget reached a 20-year low. In 1999, policymakers halted that decline and provided regular and supplemental appropriations that constituted real (inflation-adjusted) growth in the resources available to support national defense activities. In particular, funds for procuring new equipment and weapons, which had shrunk by a larger percentage than had the total defense budget, began to receive significant, real boosts.

That increased funding, however, has not eliminated questions about future defense budgets—in particular, about the level of funding necessary to sustain today's forces. (The “sustaining” budget that this study addresses is the annual funding that would be needed to retain U.S. military forces at their current size, modernize their equipment, and maintain current

levels of readiness for operations.) Before policymakers can ask and answer questions about future defense budgets, however, broader issues require consideration. What threats does the United States face? What strategy is appropriate to respond to those threats? And what military forces are needed to implement that strategy?

A full examination of those questions demands a complex political and military analysis that would begin by appraising the role that the United States wants to play in the post-Cold War world and how specific foreign policy interests and objectives help determine that role. From those considerations would follow a national security strategy, one element of which would be the function of military force and the threat of force. Using that strategy as a basis, the missions that the military might assume could then be determined, the number of forces needed to perform those missions established, and their budgetary requirements calculated. A further consideration in that calculus, many observers now believe, is the increasing importance to policymakers of minimizing U.S. casualties in military operations. That attitude might significantly affect how missions are conducted as well as which forces are used. It might also affect the number of forces the military maintains, because many defense leaders believe that overwhelming superiority shortens wars and reduces U.S. casualties.

This study does not address the broader issues associated with the kind of examination detailed

above. Although the study briefly discusses present-day threats to U.S. security, describes the nation's current military strategy, and reviews the structure of today's military forces, it does not analyze whether those forces are adequate in number and appropriately configured to support the strategy. Instead, this Congressional Budget Office (CBO) analysis accepts as a "given" the military forces that the Administration has decided to retain to implement its current strategy and assesses the budgetary implications of those decisions.

Current Threats to U.S. Security

With the breakdown of the Soviet Union, U.S. military forces are now the strongest in the world. Among all foreign powers, only China and Russia have armed forces and inventories of conventional weapons (broadly speaking, nonnuclear arms) that are close in

Table 1.
Funding for National Defense and Personnel for the Department of Defense
in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999 ^a
Budget Authority (In billions of 2000 dollars)					
Department of Defense					
Military personnel	109	93	78	73	-33
Operation and maintenance	116	99	99	109	-6
Procurement	97	58	44	52	-47
Research, development, test, and evaluation	47	42	38	39	-17
Military construction	7	5	6	6	-20
Family housing	4	4	4	4	-11
Subtotal	380	302	269	282	-26
Other Agencies ^b	11	16	13	14	23
Total, National Defense ^c	391	318	282	296	-24
DoD Personnel (In thousands)^d					
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SOURCE: Congressional Budget Office using data from the Department of Defense and the Office of Management and Budget.

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- Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
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- Strength measured at the end of the year.

size to those of the United States (see Figure 1). The Chinese People's Liberation Army is the largest army in the world, with almost 2 million troops. It has large stocks of conventional weapons, but most of them were developed in the 1950s and 1960s and are far less sophisticated than comparable U.S. versions. Russia also has substantial stocks of most conventional weapons, largely inherited from the former Soviet Union. Many defense analysts believe, however, that significant numbers of the weapons may be in very poor condition. Despite such shortcomings, the forces of those nations and of others could still threaten U.S. interests and be used to menace U.S. allies.

U.S. defense planning currently emphasizes preparing for threats posed by countries that may have less combat capability than Russia and China but that nevertheless still threaten the peace in their own regions. Of those powers, Iran, Iraq, and North Korea probably have the most significant military capabilities; consequently, wars in the Persian Gulf region and on the Korean Peninsula are the scenarios that for the most part drive the United States' plans for its military forces. Yet those countries have far less military equipment than the United States has and lack other advantages of U.S. forces—for example, aircraft that can penetrate enemy defenses without being detected in time to be shot down, large quantities of precision-guided munitions, better surveillance and reconnaissance, and more sophisticated command, control, and communication systems.

As U.S. military leaders have noted, however, the most worrisome threats to U.S. interests may not be the conventional forces of foreign powers. Instead, so-called unconventional threats to the United States and to U.S. forces overseas may pose greater dangers. Such threats range from nuclear, biological, or chemical (NBC) weapons to "cyberattacks"—assaults on the United States' computer infrastructure.¹ Uncon-

ventional threats are difficult to assess and, as a result, hard to counter. Attacks with such weapons may also require responses that are difficult to carry out because they go beyond the boundaries of standard military activities.²

Many of the same regional powers that U.S. planners worry most about facing in conflicts with conventional weapons also have NBC weapons. In the developing world today, about 20 countries are believed to have stocks of chemical weapons. Iraq, for example, used them extensively during its war against Iran in the 1980s. Almost 20 more countries are believed to have developed some type of biological weapon. And some defense planners suspect that Iran, Iraq, and North Korea are very close to developing their own nuclear arms—if they do not already have them. Not surprisingly, many of the countries that have or are developing NBC weapons are also developing the means—perhaps through ballistic missiles—to deliver them effectively.

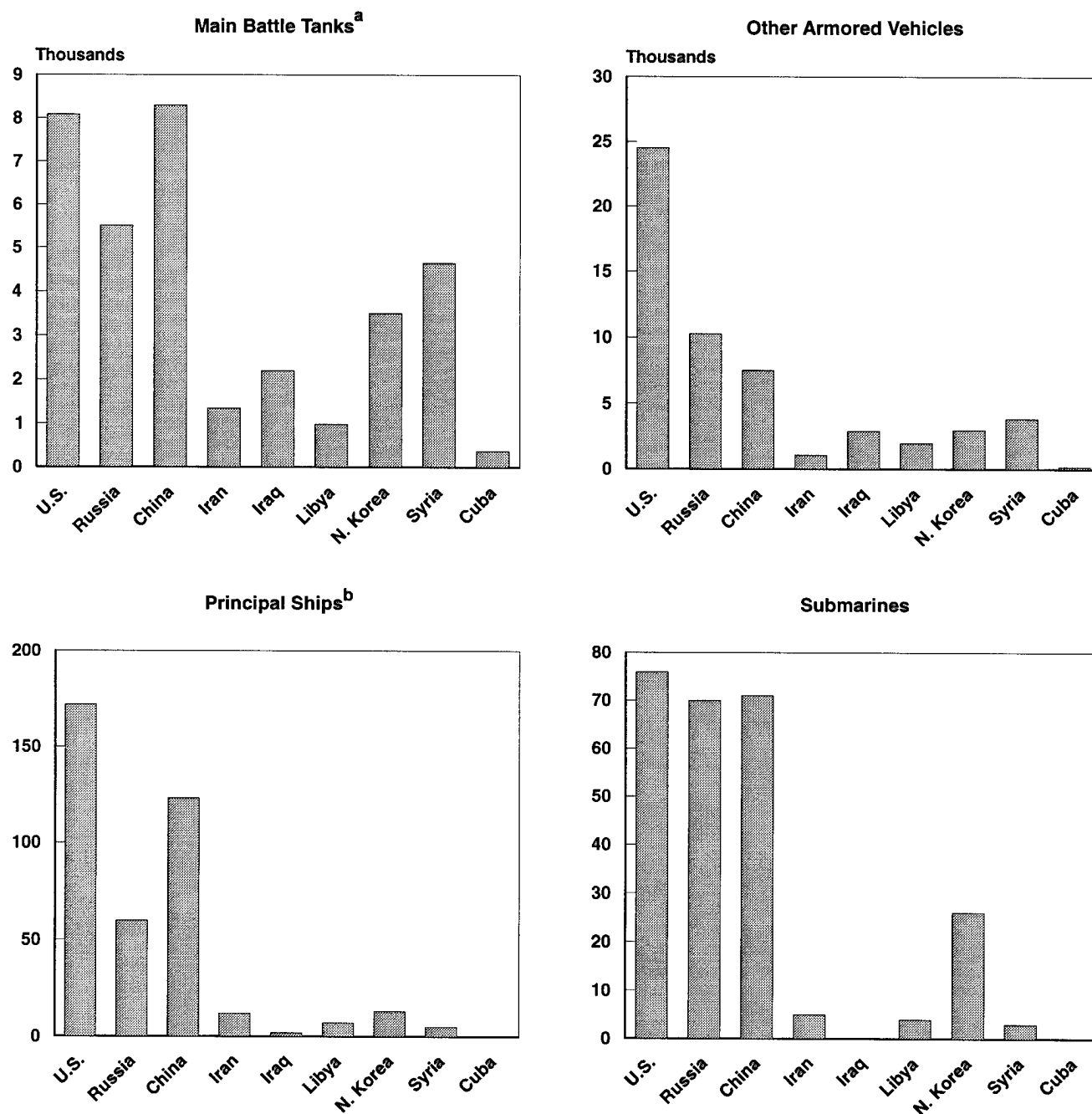
Another potentially serious threat that has surfaced in recent years is attacks against military and civilian computer and communication networks. The risk of such assaults by individuals and groups seeking to disrupt U.S. warfighting abilities or critical elements of the U.S. economy and infrastructure has grown in the 1990s as the number of computers, computer networks, and Internet users has exploded. That aggression can take two basic forms: electronic attacks by hackers on computer networks themselves or physical attacks on critical nodes such as power supplies, switching stations, or satellite ground stations. The U.S. military has become more vulnerable to such threats as it relies increasingly on computer networks and comes to depend more and more on commercial communication satellites and systems. Civilian com-

1. CBO uses the term "NBC weapons," but defense experts may use a variety of phrases for such threats. Some analysts use "weapons of mass destruction," which generally cover larger attacks and might also include conventional attacks using high explosives. Several recent studies have used "chemical, biological, radiological, and nuclear weapons" to focus attention on the potential for radiological attacks (for instance, poisoning people by wrapping conventional explosives in highly radiological materials). That term is used in the *First Annual Report to the President and the Congress of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving*

Weapons of Mass Destruction, December 15, 1999 (available at www.rand.org/organization/nsrd/terrpanel/terror.pdf) and in Anthony H. Cordesman, "Defending America: Redefining the Conceptual Borders of Homeland Defense" (draft, Washington, D.C., Center for Strategic and International Studies, September 3, 2000), available at www.csis.org/homeland/reports/NMDfullreport.pdf.

2. In the event of an attack with biological weapons, for example, military forces might want to help local officials with law enforcement. But the Supreme Court has upheld laws that restrict the Department of Defense's (DoD's) involvement in certain domestic situations. Those constraints limit the assistance DoD can offer and place the burden of response on other federal, state, or local agencies.

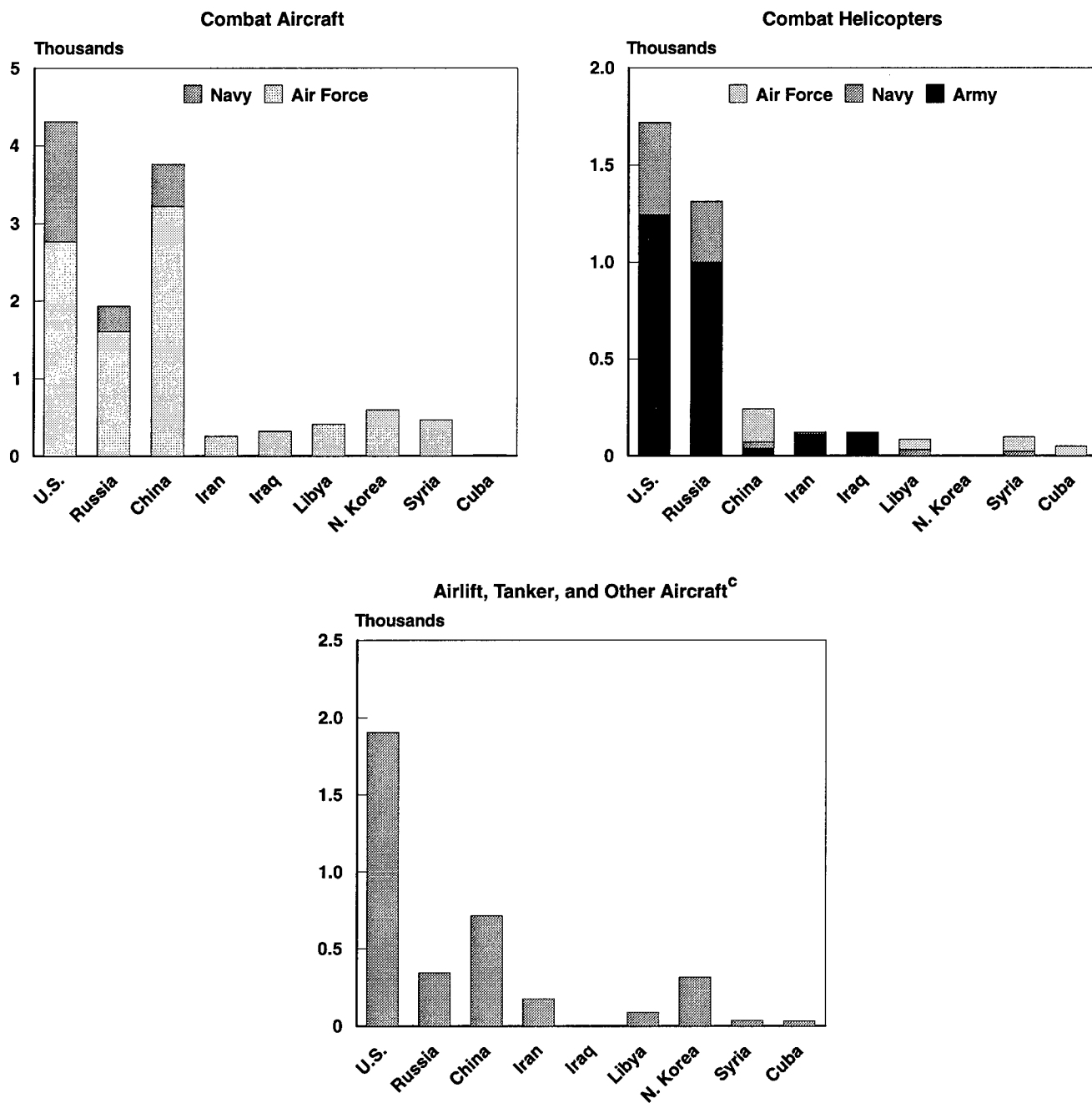
Figure 1.
Stocks of Major Weapon Systems Held by the United States and Selected Other Nations



SOURCE: Congressional Budget Office using data from International Institute for Strategic Studies, *The Military Balance, 1999/2000* (London: International Institute for Strategic Studies, October 1999).

a. For Russia, stocks as reported on January 1, 1999, under the Treaty of Conventional Forces in Europe.

Figure 1.
Continued



b. Includes aircraft carriers, surface combat ships, and amphibious vessels but excludes a number of other ships that the U.S. Navy counts as battle force ships.

c. Includes only air force planes and excludes training aircraft. *The Military Balance* provided no data for Iraq.

puter networks at the core of the nation's financial infrastructure and rail and air transportation systems, as well as communication networks, could also be vulnerable.³

Even if unconventional weapons were not used to attack the United States itself, they might restrict the U.S. military's operations overseas. The nation's superior conventional forces and weapons would be of limited value in a regional war if an enemy's threat of retaliation with NBC weapons deterred the United States from using its conventional arms. Moreover, if enemies with only modest conventional capabilities but stocks of unconventional weapons developed intercontinental ballistic missiles that could reach the United States, those nations could exert considerable leverage and pose a sizable threat.

As unconventional threats have multiplied, their claim on the attention of U.S. leaders and defense analysts has increased. Some officials have called for more spending on defenses against ballistic missiles.⁴ Others advocate radically transforming the way the United States develops its strategies and structures its forces. Decisions on those kinds of issues are likely to be among the challenges that will face the new Administration and the 107th Congress.

Current U.S. Military Strategy

Following logically on the identification of threats to a nation would be the development of policies to counter

those threats. In the United States, those policies constitute the national security strategy, which can be roughly defined as the nation's evolving plan for coordinated use of all of the instruments of state power to defend and advance the national interest.⁵ Military force or the threat of force is a chief component of that plan. Because strategy determines the missions that the military services are expected to accomplish to counter national security threats, it also influences the levels and types of forces that the U.S. military requires and how modern and ready those forces need to be.

Today's military strategy calls for enough forces to fight two regional wars and to support peace operations.⁶ Strategically, the goal of being able to respond to two major wars in different regional theaters (two major theater wars, or MTWs) that occur nearly simultaneously determines in large part the number of combat forces that the U.S. military maintains. The two-MTW metric was initially developed in the immediate aftermath of the Cold War, when the Department of Defense (DoD) first formulated its regional defense strategy. That strategy defined a base force—DoD's estimate of the minimum force required to accomplish

3. Terrorists with unconventional weapons they have developed or stolen are a further threat that could be even more dangerous for the United States than a crisis involving a nation state, which might be deterred from acting by persuasion or the threat of force.

4. The Rumsfeld Commission—a panel charged with assessing the current and potential threat to the United States from missile attack and the capability of the U.S. intelligence community to provide timely warning—has added to concerns about those issues. The commission reported in 1998 that widespread foreign assistance and extensive efforts to hide missile development programs from Western intelligence have created conditions under which North Korea, Iran, and Iraq could, with very little warning, deploy ballistic missiles with ranges long enough to strike parts of the United States. See Commission to Assess the Ballistic Missile Threat to the United States, *Executive Summary of the Report of the Commission to Assess the Ballistic Missile Threat to the United States*, July 15, 1998, pursuant to Public Law 201, 104th Congress (available at www.fas.org/irp/threat/bm-threat.htm).

5. For a description of the Administration's current strategy, see the White House, *A National Security Strategy for a New Century* (December 1999). For a critique of the Administration's strategy, see National Defense Panel, *Transforming Defense: National Security in the 21st Century* (December 1997). See also United States Commission on National Security/21st Century, *Seeking a National Strategy: A Concert for Preserving Security and Promoting Freedom* (April 2000). That commission is at work evaluating the current strategy and may propose revising it. For an evaluation of all aspects of the strategy and proposed alternatives, see Zalmay M. Khalilzad and David Ochmanek, eds., *Strategy and Defense Planning for the 21st Century* (Santa Monica, Calif.: RAND, 1997).

6. CBO uses the term "peace operations" in this study to refer to military operations other than war, or MOOTWs. The Office of the Joint Chiefs of Staff, in the *Joint Doctrine Encyclopedia*, defines MOOTWs as follows: "Operations that encompass the use of military capabilities across the range of military operations short of war. These actions can be applied to complement any combination of the other instruments of national power and occur before, during, and after war." According to that encyclopedia, military operations in this category include peace enforcement, counterterrorism, shows of force, peacekeeping, noncombatant evacuation operations, counterinsurgency, counterdrug, and humanitarian assistance. (The *Joint Doctrine Encyclopedia* is available at www.dtic.mil/doctrine/jrm/ency.htm.) Another umbrella term that is sometimes used is smaller-scale contingencies. For a more detailed discussion of peace operations, see Congressional Budget Office, *Making Peace While Staying Ready for War: The Challenges of U.S. Military Participation in Peace Operations*, CBO Paper (December 1999).

U.S. national security goals during the post-Cold War period.⁷

DoD's 1993 Bottom-Up Review (BUR), one of the department's periodic assessments of the capabilities it needed to maintain or develop to carry out its missions, endorsed the two-MTW yardstick.⁸ The BUR developed overall requirements for U.S. combat forces by taking the forces deemed necessary for the first conflict and doubling them to deter—or fight, if necessary—a second aggressor. The Congressionally mandated Quadrennial Defense Review (QDR) of 1997 basically endorsed the force levels that emerged from the BUR, but it made a few changes.⁹ (For example, the QDR cut the Navy's requirements for surface combat ships from the force of 131 ships planned in the BUR to a force of 116.) The QDR planned for 2001 is likely to bring other changes as well.

Operations that the U.S. military conducts in peacetime also influence, to some degree, the forces DoD must maintain. The Clinton Administration's defense policy has heavily emphasized such peace operations as humanitarian assistance and civil-support and nation-building activities. That emphasis derives from the Administration's goal of shaping the national security environment to make it more positive toward U.S. interests. As a result, U.S. forces engaged in peace operations to a much greater degree in the 1990s than they did during the Cold War. Peace operations may require forces that have less relevance to combat—for example, units with personnel expert in helping nations develop civil institutions such as courts. Requirements for those kinds of personnel can drive up the number of such units that the military must maintain.

The military's operations in both war and peace also affect the pace at which it modernizes its weapons and equipment. During the Cold War, the primary

impetus for U.S. military modernization was the perceived need to keep up with the development and fielding of new systems by the former Soviet Union. But modernizing solely to stay ahead of adversaries may no longer be as strong a rationale for allocating resources as it was in the past. As discussed earlier, most U.S. forces are already much more sophisticated or capable than the forces of countries that could oppose the United States in major regional wars. U.S. superiority is even more overwhelming compared with the capabilities of military forces in countries where the United States might participate in operations other than war. And it is unlikely that any of those countries will have the funds any time soon to modernize their forces sufficiently to gain parity with the U.S. military.

What arguments, then, would justify increasing funds for modernization, as occurred in 1999?

- o First, the United States may wish to preserve its overwhelming superiority, which, as service leaders regularly argue, leads to shorter conflicts and fewer U.S. casualties. Even with limited defense budgets, potential adversaries could focus their resources on developing certain technologies or tactics that offset U.S. conventional capabilities in particular areas. If opponents could, for example, develop chemical or biological weapons and use them to attack ports or airfields, they could slow the deployment of U.S. air and ground forces during a conflict.
- o Second, focusing strategic planning only on today's threats could produce a misleading sense of security, which could result in modernization that was too slow (as well as cuts in forces that were too large). Over the course of several decades, nations that are no threat today could amass significant military capability, as Germany did in the decade preceding World War II.

Some defense analysts argue that in the post-Cold War world, U.S. modernization efforts should have a different focus. They advocate basing modernization not on the capabilities of foreign powers but on the objectives that the United States wishes to accomplish and the capabilities that the nation wishes to de-

7. General Colin L. Powell, Chairman of the Joint Chiefs of Staff, "The Base Force—A Total Force" (briefing prepared for the Subcommittee on Defense of the House Committee on Appropriations, September 25, 1991).

8. Secretary of Defense Les Aspin, *Report on the Bottom-Up Review* (October 1993).

9. Secretary of Defense William S. Cohen, *Report of the Quadrennial Defense Review* (May 1997).

velop or improve.¹⁰ Under that kind of framework, modernization might relate more to producing weapons that were cheaper to operate than comparable weapons today or that accomplished missions that no current weapons could carry out. It might also include preparing to counter threats posed by technologies that are now available only to U.S. forces but that could be acquired by other nations in the future.

The basis that the military chooses for its modernization efforts is only one of a number of factors that affect how much money DoD ultimately needs to support its forces. The following section considers some of the major determinants of the defense budget.

What Factors Drive Budget Requests for Defense?

Several important factors determine in large part how much money is needed to finance the nation's defense activities. The size and structure of U.S. military forces and their readiness for combat strongly influence budget requirements, as does investment in weapons, equipment, and facilities. The military spends its appropriations to keep those factors at acceptable levels today and also to try to preserve acceptable levels in the future.¹¹

Another major determinant of the defense budget is the cost and capability of the infrastructure that supports military forces and the efficiency with which support is delivered. DoD has estimated that spending on infrastructure support—which is found in all defense appropriations—represents more than half of the spending in DoD's overall budget. The level of that funding does not rise or fall automatically as Administrations change their strategy, forces, or plans for modernization. Thus, like large corporations, DoD

must actively seek to minimize what it spends on support, from controlling the costs of operating its facilities to providing services to its personnel as efficiently as possible. But cutting infrastructure costs has not proved to be easy, and as a result, funding for infrastructure support may well have increased as a percentage of the total defense budget over the past decade.

Force Size, Structure, and Readiness

DoD divides its forces into two major categories: strategic (basically nuclear) and conventional (see Table 2). For strategic forces, common measures of size and structure include ballistic missiles and bombers. Metrics used for conventional forces include divisions (Army and Marine Corps), tactical air wings (Air Force, Marine Corps, and Navy), and battle force ships (Navy), which include all Navy ships involved in combat—for example, aircraft carriers, surface combat ships, and submarines—as well as certain other vessels.

U.S. combat forces in 1999 were structured as follows:

- o The Army's forces included 10 active-duty divisions, with another eight divisions and 18 separate brigades in the Army National Guard. The active Army consisted of 480,000 personnel; the Army National Guard, 350,000; and the Army Reserve, 205,000.
- o The Navy operated 317 ships (others were laid up in storage) with more than 370,000 personnel on active duty and about 90,000 in the Navy Reserve. Among those ships were 18 ballistic missile submarines carrying Trident missiles.
- o Slightly more than 170,000 Marines were divided into three active divisions, three Marine air wings, and support forces. Another division and air wing made up the Marine Corps Reserve, which was supported by almost 40,000 reservists.
- o The Air Force operated the equivalent of 20 tactical fighter wings—12.6 in the active component

10. See, for example, Glenn A. Kent and William E. Simons, "Objective-Based Planning," in Paul Davis, ed., *New Challenges for Defense Planning* (Santa Monica, Calif.: RAND, 1994), pp. 59-71.

11. For the amounts appropriated in each title in the 2001 budget, see Stephen Daggett, *RL30505: Appropriations for FY2001—Defense*, CRS Appropriations Report for Congress (Congressional Research Service, August 11, 2000).

Table 2.
U.S. Military Forces in Selected Fiscal Years, 1989-1999

	1989	1993	1997	1999	Percentage Change, 1989-1999
Strategic Forces^a					
Land-Based ICBMs	1,000	787	580	550	-45
Heavy Bombers ^b	310	194	126	143	-54
Submarine-Launched Ballistic Missiles	576	408	408	432	-25
Conventional Forces^c					
Land Forces					
Army divisions ^d					
Active	18	14	10	10	-44
Reserve	10	8	8	8	-20
Marine Corps expeditionary forces ^e					
Active	3	3	3	3	0
Reserve	1	1	1	1	0
Naval Forces					
Battle force ships ^f	566	435	354	317	-44
Aircraft carriers					
Active	15	13	11	11	-27
Reserve	1	0	1	1	0
Navy carrier air wings					
Active	13	11	10	10	-23
Reserve	2	2	1	1	-50
Air Forces					
Tactical fighter wings					
Active	25	16	13	13	-48
Reserve	12	11	8	8	-33
Airlift aircraft					
Intertheater	401	382	345	331	-17
Intratheater	468	380	430	425	-9

SOURCE: Congressional Budget Office using data from Office of the Secretary of Defense, *Annual Report to the President and the Congress* (various years).

NOTE: ICBMs = intercontinental ballistic missiles.

- a. Forces with basically nuclear missions.
- b. Includes some long-range bombers that do not have strategic missions.
- c. Forces with largely nonnuclear missions.
- d. Excludes separate brigades that are not part of a division.
- e. A Marine expeditionary force includes a division, an air wing, and supporting forces for those combat elements.
- f. Includes all Navy ships involved in combat—for example, ballistic missile submarines, surface combat ships, aircraft carriers, and amphibious craft—as well as some other vessels.

and 7.6 in the Air National Guard or Air Force Reserve—as well as a large number of intercontinental ballistic missiles, strategic bombers, and airlift and tanker aircraft. Air Force personnel numbered about 360,000 in the active-duty component and 180,000 in the reserve component.

The United States places considerable emphasis on keeping its military forces ready for operations. Indeed, some military experts feel that the readiness of forces is the most important determinant of their capability. Traditionally, readiness has been a measure of how well prepared forces are to fight when they are needed. Some of the questions used to gauge military readiness are, Is equipment in good repair? Do forces have enough spare parts, fuel, and ammunition to keep them operational? Are troops in good physical condition and highly trained?

Despite the military's emphasis on readiness, it is difficult to estimate exactly how much money is being spent on it. There is no specific appropriation for "readiness"; instead, the resources that support it are spread among a broad array of budget categories, or titles. Commonly associated with readiness are the two titles that pay for DoD's annual operations: operation and maintenance (O&M) and military personnel. The O&M budget funds many kinds of equipment-related items such as spare parts and repairs and many expenses related to training. The military personnel appropriations fund pay and benefits. But not all of the funds in those two titles support current readiness, and other titles also provide funding.

Evaluating the impact of the money spent on readiness can be as difficult as estimating the amount. Readiness is difficult to quantify, and to a certain extent, evaluations of it depend on subjective military judgments. As a result, DoD's measurements of readiness have serious limitations. In the past—specifically, in the late 1970s—the military services were willing to cut back on readiness in response to budgetary and other constraints. Today, though, defense leaders do not support cutting readiness to meet budget targets and instead place a high priority on maintaining it. Despite that priority, some defense officials believe that the readiness of U.S. forces has declined enough to be a basis for concern. Others believe that readiness remains at acceptable levels. Those varying opinions underscore the difficulties of reaching a con-

sensus about readiness when objective measures are lacking.

Investment

As discussed earlier, most of the nations that might threaten U.S. interests today or in which U.S. forces might be called on to intervene in peacetime have weapons that are significantly less capable than the current generation of U.S. weapons. The military's investment in modernization, therefore, focuses on maintaining a significant level of superiority now and preparing for other threats, perhaps from unconventional sources, that might emerge in the longer term. Funds for modernization, which is a third major determinant of the size of the defense budget, are spread among the appropriations for research and development and for procurement of equipment and weapon systems. Funding for military construction and military family housing is also included under the rubric of investment because those two budget categories support purchases of buildings and facilities that last a long time. In general, funding in those categories is less directly linked to responding to threats than are funds in some other areas of the budget.

Research and Development. Funding for research and development pays for basic and applied research that explores new technologies (with possible military implications) and develops and tests new systems. Those activities are intended to enable the military to respond to emerging threats, take advantage of new technologies, and address other objectives, such as improving the mobility of U.S. forces or producing systems that are less expensive to operate. In the 1990s, funding for defense research and development was protected to a degree from cuts, perhaps reflecting the belief of policymakers that the continued superiority of the U.S. military required a strong technological foundation.

Procurement. How many new weapons DoD purchases and how much it upgrades and modernizes its existing stocks determine how much it spends on procurement. During the 1990s, as military forces were being cut, DoD halted or slowed purchases of a number of weapons. In addition, the services retired many pieces of equipment that had not yet reached the end of

their useful lives because they were no longer needed to equip the military's smaller forces.

As purchases over the decade slowed or stopped, the average age of many classes of defense equipment rose. Trying to halt or reverse that trend, DoD has included more money for procurement in its recent budget requests. As noted earlier, appropriations have met or exceeded those requests, and DoD plans to increase spending on procurement even further over the next few years.

Military Construction and Family Housing. Funding for military construction constitutes a relatively modest share of the defense budget. Over the past decade, funding for new construction or for renovation of existing facilities may have been reduced to pay for the base realignment and closure process in which DoD engaged during those years. The smaller U.S. military of the post-Cold War period as well as budgetary constraints arising from the federal deficit led policymakers to conclude that the nation needed fewer military bases. Closing bases was expected to save money in the long run, but shutting them brought some up-front expenses. (Some of those costs were for environmental cleanup at the bases.) Thus, in the early

to mid-1990s, expenditures related to base closures equaled as much as 19 percent of the funds appropriated for military construction. DoD has sought to reduce funds for military construction in the long run through additional rounds of base closure, but the Congress has not authorized further rounds.

Funds to construct new military family housing units, to renovate existing units, and to pay for the upkeep of facilities were also limited during the 1990s. As a result, DoD's stock of family housing is aging and deteriorating. Currently, DoD is seeking to increase private-sector involvement in modernizing its housing units.

For the above categories of the budget as well as others, DoD has sought to increase the funding it receives to support its forces and carry out its missions. But some experts and policymakers argue that funding for national defense is still not adequate to accomplish the military's objectives under the national security strategy and to ensure the readiness of U.S. forces. In the next chapter, CBO presents its estimate of the sustaining, or steady-state, funding needed for those purposes.

CBO's Estimate of a Sustaining Budget for National Defense

The Congressional Budget Office's estimate of a sustaining budget for the U.S. military answers the question, What budgetary resources would be required to sustain today's forces into the future? In general, CBO estimated the funding it would take to retain forces at their current size; to modernize their equipment at a pace consistent with the expected service lives of the equipment and with continuing the military's technological advantage over potential adversaries; and to maintain current funding for readiness and training. Specifically, CBO's estimate of a sustaining defense budget would:

- o Provide enough funds to maintain current operating tempos (the rates of military training and operations) and current levels of maintenance and support for equipment;
- o Keep increases in military and civilian pay for Department of Defense personnel comparable with pay increases in the private sector;
- o Provide enough funding for modernization to purchase new equipment to eventually replace all current items;
- o Provide funding for research and development that is consistent with historical levels; and
- o Provide funds to repair and replace the existing stock of military facilities and family housing units.

The concept of a sustaining budget represents the funding that DoD would require in a "steady state," when everything was held constant and nothing changed over time. In other words, CBO's estimate begins with the size and structure of today's military and calculates the annual budget that would be necessary to sustain it into the future. Of course, in reality, many things can and do change over time—including the number and structure of military units, technology, the pace of military operations, the civilian labor market from which military and civilian personnel are drawn, and countless other factors that affect how much money it would take to provide a given level of military capability. So many things can change that it is difficult, if not impossible, to compare an estimate of the defense budget that would be required for a given period with estimates for budgets covering other periods. In any use of CBO's sustaining-budget estimate, that caveat should be kept in mind.

The Scope of the Estimate

CBO estimated that a sustaining budget for all national defense activities (budget function 050) would total \$340 billion. (CBO's estimates in this study are in 2000 dollars of budget authority.) Included in that total are funds for the Department of Defense and for the defense-related activities of the Department of Energy and other agencies of the federal government. In 2000, the Congress appropriated \$289 billion for na-

tional defense: \$276 billion went to DoD, \$12 billion to the Department of Energy, and \$1 billion to the remaining agencies. CBO's estimate of a sustaining budget for today's national defense activities is thus \$50 billion higher than the actual appropriations for 2000. (The 2000 appropriations that are discussed in this paper do not include supplemental appropriations, which total about \$9 billion.)

Since CBO's estimate of a sustaining budget is a long-run, or steady-state, concept, it is not an estimate of the national defense budget for 2001 or for any other fiscal year. That kind of calculation would have to take many factors into account, including the aging of specific types of weapons and equipment; the priority to be given in the short term to purchases of certain equipment or to certain operations compared with other equipment and operations; and the status of new weapons and equipment (whether they were ready to enter production). Such factors were not considered in developing CBO's estimate of a sustaining budget.

CBO's Estimate of a Sustaining Budget for the Department of Defense

CBO estimates that sustaining funding for DoD would total \$327 billion. The discussions that follow break down that total by budget title. Most of the funds that the Congress appropriates for DoD fall into six titles: military personnel; operation and maintenance; procurement; research, development, test, and evaluation; military construction; and family housing.¹ CBO developed separate estimates of funding for those categories for each of the three military departments and a total estimate for the rest of DoD's organizational components (mainly the defense agencies).² However,

with the exception of procurement, the discussions in this section present only the total estimates for each title (see Table 3). As part of those discussions, CBO also assesses both the uncertainties surrounding those estimates and their sensitivity—how much the estimates would be affected by changes in the assumptions used to develop them.

Military Personnel Appropriations

The military competes with the private sector for its personnel. To keep the quality and quantity of today's forces in a steady state, their compensation must remain competitive with compensation in the private sector, which generally rises each year at a rate above inflation.³ So a sustaining budget for military personnel must increase each year.

In 2000, the Congress appropriated \$74 billion for military personnel. To calculate a sustaining budget for that category, CBO had to choose an actual period over which to project the increase in pay and benefits. Such a choice is necessarily arbitrary; CBO chose 2001 through 2015 as a reasonable span over which to make its calculations. (The effects of using a longer or shorter period are discussed below.) To maintain military pay and benefits at today's level over that period, military personnel appropriations would need to average \$82 billion annually, CBO estimates.

What the Funds Purchase. In total, the services today have about 1.4 million members on active duty and another 0.9 million in the reserves, which include the National Guard. Military personnel appropriations cover pay and many benefits for active and reserve military personnel in the four services, as well as accrual charges for future retirement pay. The appropriations also include the cost of allowances that military personnel receive for subsistence and housing, together with moving costs to relocate personnel from one permanent duty location to another. (Housing benefits that the services provide to their members in-

1. Two other categories, revolving and management funds and trust funds, are intermediate financing mechanisms and are not discussed in detail here.

2. There are three military departments: the Army, the Navy, and the Air Force. The Marine Corps falls under the Department of the Navy. In addition, DoD includes a number of separate support agencies such as the Defense Intelligence Agency and the Defense Logistics Agency. Funding for defense agencies comes from multiple appropriation titles. CBO's forthcoming study, *Budgeting for Naval Forces: Structuring*

Tomorrow's Navy at Today's Funding Level, addresses funding for the Department of the Navy in more detail.

3. One measure of the "quality" of military forces is the percentage of high school graduates among the services' recruits.

clude housing in government-owned units and allowances that personnel can use to secure housing in the private sector. See the later discussion on family housing.)

Estimating Methods. CBO's estimate for this budget title began with the amount appropriated for military personnel in 2000. That figure reflects the changes that the Congress made in 1999 to the military's retirement system and pay table. In estimating a sustaining-budget amount, CBO held constant the total number of current service members as well as their pay grade and length of service.

As part of its estimate, CBO increased DoD's costs for military personnel during each year of the 2001-2015 period by an estimated rate of real growth that is specified in law. The National Defense Autho-

rization Act for Fiscal Year 2000 directs DoD to adjust upward the nominal value of the pay portion of military personnel appropriations by certain amounts each year. In 2001 through 2006, that increase is set to equal the percentage change in the employment cost index (ECI) plus 0.5 percentage points; thereafter, the pay portion would rise at the same rate as the ECI. The sustaining-budget estimate reflects those mandated increases, which CBO based on a projection of future growth in the ECI averaging 3.3 percent per year through 2015. To calculate annual real growth, CBO deflated the nominal value of military pay by its projection for the gross domestic product (GDP) price index. Under that approach, the real cost of military pay would increase by about 1.5 percent annually, and total funding for the military personnel title would rise by about 1.2 percent per year. At those rates, the appropriations for military personnel would total about

Table 3.
Fiscal Year 2000 Appropriations for National Defense and CBO's Estimate of a Sustaining Defense Budget, by Budget Category (In billions of 2000 dollars of budget authority)

	Appropriation for Fiscal Year 2000 ^a	Sustaining- Budget Estimate ^b
Department of Defense (Budget subfunction 051)		
Military personnel	74	82
Operation and maintenance	102	107
Procurement	53	90
Research, development, test, and evaluation	38	40
Military construction	5	5
Family housing	<u>4</u>	<u>4</u>
Subtotal	276	327
Other Agencies (Budget subfunctions 053 and 054) ^c	<u>13</u>	<u>13</u>
Total, National Defense (Budget function 050) ^d	289	340

SOURCE: Congressional Budget Office.

NOTE: The figures in the table include both discretionary and mandatory funding.

- Based on CBO's estimates as of July 2000 but excluding supplemental appropriations of about \$9 billion.
- The sustaining-budget estimate is CBO's calculation of the annual funding required to maintain U.S. military forces at their current size; to modernize their weapons and equipment at a rate that is consistent with expected service lives and with maintaining a technological advantage over potential adversaries; and to maintain current funding for readiness. It is a steady-state concept and not an estimate of the defense budget for any specific year.
- Covers defense activities related to atomic energy in the Department of Energy and national defense functions in other agencies.
- Includes revolving and management funds, trust funds, and offsetting receipts, which total less than \$0.5 billion. Excludes contract authority for the working capital funds because appropriations are used to liquidate that authority.

\$88 billion in 2015; over the 15-year period, appropriations would average about \$82 billion annually.

Uncertainty and Sensitivity of the Estimate. To maintain the current number and quality of military personnel, CBO assumed that increases in real pay would need to equal or exceed those in the economy as a whole. But private-sector pay could increase more or less than CBO has assumed. If real wages in the private sector grew substantially more than CBO projected, future policymakers might need to increase compensation for the military even more than estimated to maintain an equally qualified force. Conversely, private-sector wages that grew more slowly than in CBO's projections might result in smaller increases in the future.

If, for example, military pay increased annually by 2.2 percent rather than by 1.5 percent (the figure CBO used in its calculation), DoD would need about \$85 billion each year, on average, over the 2001-2015 period. But if pay grew by only 1.2 percent, the department would need about \$80 billion.

Moreover, CBO's decision to use the 2001-2015 period affected its estimate. A longer or shorter period would change the calculation. For instance, choosing the 2001-2010 period would yield an estimate of only \$79 billion; using 2001 to 2020 would produce an estimate of \$84 billion.

Pay is only one aspect of the civilian labor market, however. Unemployment rates can affect the propensity to enlist and reenlist, as can young adults' attitudes toward military service. Those factors and others could potentially affect the compensation rates needed to keep a force of the current size and quality. More generally, if the labor market for young adults tightens further or even remains as challenging for military recruitment and retention as it is today, the costs of labor (military pay and benefits) could rise faster than the costs of other aspects of support for military forces. However, an analysis of those issues is beyond the scope of this study.

Operation and Maintenance Appropriations

Together with the funding for military personnel, the operation and maintenance appropriations provide most of DoD's annual operating budget.⁴ The adequacy of O&M funds, therefore, is an important determinant of whether military forces are trained and ready to fight on short notice.

Part of the O&M appropriations covers pay and benefits for most of the civilians who work for the Defense Department. To estimate a sustaining budget for those costs, CBO used the same period (2001 to 2015) and techniques that it used for military personnel. CBO estimates that O&M funding would need to average about \$107 billion annually to maintain a civilian workforce equivalent to today's and to cover the cost of the items and services that are also funded through these appropriations. In 2000, the Congress appropriated about \$102 billion for the O&M title.

What the Funds Purchase. Pay and benefits for most of DoD's civilian employees constitute about a third of the costs in the O&M category. (DoD employs the equivalent of about 700,000 full-time civilian personnel.) The other two-thirds of the appropriations cover many of the costs of diverse items and activities that include fuel, spare parts for DoD equipment, other supplies, operations at military bases, training and education of individual service members, and medical care.

Estimating Methods. CBO developed its estimate of sustaining O&M funding in two parts: one for civilian pay and one for the rest of the appropriations. In estimating the pay of DoD's civilian workers in each military department and in the other DoD organizations, CBO took the pay they received in 2000 and increased it each year by the projected annual percentage rise in the ECI minus the estimated rate of inflation (in the form of the GDP price index). In estimating funding for the remaining portion of the O&M title, CBO simply used the amount appropriated for 2000.

4. See *Budget of the United States Government, Fiscal Year 2001: Appendix*.

Uncertainty and Sensitivity of the Estimate. Any estimate of sustaining funding for the O&M title is uncertain to a significant degree. One reason is that the appropriations pay for so many disparate goods and services. Another is that O&M funding is influenced by numerous factors, including:

- o The number, type, and condition of the services' equipment;
- o The number, size, type, and condition of DoD's facilities;
- o The number, size, and type of operations and deployments undertaken by military forces;
- o The cost of medical care for beneficiaries of DoD's health care system; and
- o The size and pay-grade structure of DoD's civilian workforce.

CBO's assumption that a sustaining budget for two-thirds of the funds in the O&M category (those spent on purchases) would be the same as this year's budget is based on its approach of holding constant as many factors as possible. Among the most important are the structure of DoD's forces, the number of personnel, and the way the department organizes and manages its business operations. Considerable uncertainty remains, nevertheless, about the level of O&M funding that would be required to sustain the readiness and operations of today's military.

Upward Pressures on O&M Spending. At least over the past 30 years, O&M spending per capita—that is, spending adjusted for the size of the active-duty military—has increased annually by an average of 2 percent to 3 percent in real terms. Indeed, the O&M budget, on a per-person basis, was about 35 percent higher in the 1980s than in the 1970s, and it averaged about 25 percent more in the 1990s than in the 1980s.

Some of DoD's leaders have suggested that per capita spending for O&M could continue to grow in

the future.⁵ Analysts have suggested that factors such as additional costs for training personnel to operate ever more complex equipment and funding for more-sophisticated spare parts might contribute to growth in the future and push O&M spending higher than CBO's sustaining-budget estimate. If, for example, spending grew by 2 percent per year over the next 15 years, annual O&M budgets would average about \$13 billion more than CBO's estimate.

An example of a budget category that could easily grow is medical costs. Funding for military medical care totaled about \$17 billion in 2000; about \$12 billion of that amount was part of the O&M title. If DoD's medical costs maintain their past relationship to national health expenditures—which are projected to increase in the future—DoD's average O&M bill could be more than \$2 billion higher than CBO's sustaining-budget estimate.

Downward Pressures on O&M Spending. The underlying determinants of past increases in O&M spending may not persist into the future. For instance, the increase in the 1990s in O&M spending per capita may reflect the cuts in military forces following the Cold War. Those cuts, it could be argued, spread DoD's fixed costs—many of which are funded through the O&M appropriations—over a smaller number of military personnel, which raised O&M costs per person. If that argument is valid, the increase will not be repeated as long as DoD's forces and the number of military personnel are held constant, which CBO's estimate assumes.

Other factors—the effects of management initiatives, possible additional base closures, and other economies, to name a few—might wholly or partially offset any tendency for O&M costs to rise. If future Administrations made DoD's business practices more efficient, reduced maintenance costs, or closed more bases, O&M spending could be cut considerably. Indeed, by DoD's estimates, an additional round of base closures comparable with those in the 1990s could bring annual savings of as much as \$3 billion, some of which would come from the O&M title.

5. "Department of Defense Press Briefing on the Fiscal Year 2001 Budget Submission," February 7, 2000. Despite the potential for growth in per capita spending, the budgets DoD has planned through 2006 do not reflect such increases.

Also likely to dampen costs is a shift in the age distribution and pay-grade structure of DoD's civilian workforce. The current workforce, on which CBO based its sustaining-budget estimate, is more senior than the future workforce is likely to be. Thirty-five percent of today's civilian DoD workers are age 51 or older and will be eligible for retirement in the next few years; 75 percent of workers are over 40, and many of them are also likely to retire in the next two decades. If employees at lower pay grades replaced retirees, the O&M funding needed would be less than the amount CBO assumed. In fact, if the average pay grade among DoD's civilian personnel dropped by just two steps (from today's average of grade 9, step 9, to grade 9, step 7), O&M funding for civilian salaries would fall by between \$1 billion and \$2 billion a year.

Finally, as for military personnel, CBO's decision to use 2001 through 2015 as the period for its estimate affects overall O&M funding in its sustaining budget. Basing the estimate on the 2001-2010 period would yield a total of \$106 billion in sustaining funding for the O&M title (\$1 billion less than the estimate presented here). In contrast, using the 2001-2020 period would yield an estimate of \$108 billion.

Procurement Appropriations

Funding for procurement buys new weapons and other equipment that DoD needs to carry out its missions in peacetime and to prepare for war. The funds cover a wide array of items ranging from aircraft, ships, and missiles to automobiles and air conditioners.

The Congress appropriated \$53 billion for defense procurement in 2000, but by CBO's estimate, annual sustaining funding for procurement would total about \$90 billion. That figure falls within the range of past experience and is only about 15 percent below the average for the 1980s—a period when DoD was buying large quantities of many systems. (In 2000 dollars, funding for procurement averaged \$64 billion in the 1970s, \$104 billion in the 1980s, and \$59 billion in the 1990s.)

Because major procurement programs overlap, funding for procurement might need to exceed \$90 billion in some years, but those years would be offset

by years in which the budget could fall below \$90 billion. CBO's estimate is not an average; it represents the steady-state amount that would be sufficient over time to replenish the equipment associated with current forces.

CBO's estimate of a sustaining budget for procurement has two parts: an estimate for major weapon systems such as aircraft, ships, and tanks, for which DoD provides detailed procurement plans; and an estimate for all other equipment, for which DoD provides less detail. The latter category includes such items as communications equipment, trucks, and computers.

Procurement of Major Systems. CBO's estimate of the annual funding needed to procure major air, sea, and land systems to sustain DoD's current forces is \$40 billion. Of that amount, roughly \$5 billion would pay for Army systems, \$20 billion for Navy (including Marine Corps) systems, and \$15 billion for Air Force systems. CBO based its estimate on the number of systems that DoD requires for its current forces, the projected service lives of those systems, and the costs of replacing them.

Estimating Methods. In calculating sustaining funding for procurement of DoD's major equipment, CBO took into account only the numbers and types of systems to be purchased and not the current procurement budget or the age distribution of the systems in a particular "fleet," or inventory. If DoD purchased all of its systems in the quantities reflected in this estimate, its inventories would eventually be evenly distributed throughout a range of ages—that is, from new deliveries to systems ready for retirement. Retirements from inventories with such a distribution would be steady instead of varying from year to year, as they would if systems were purchased unevenly. Thus, the average fleet age of each system (the average age for all systems of that type) would come to equal half the equipment's service life and would neither increase nor decrease thereafter.

The following example illustrates how CBO arrived at steady-state dollar values for the quantities of major systems it assumed would be procured. The inventory of aircraft that CBO considered in calculating a sustaining-budget estimate for the Air Force totals about 5,100. The expected service lives of those planes stretch from 30 years for fighters to 80 years

for bombers. The costs for replacing them range from \$10 million to \$400 million per plane. To calculate an annual sustaining budget for each type of aircraft, CBO determined how many DoD needed to buy each year (the annual requirement), dividing the inventory by the plane's expected service life and adding an adjustment for expected yearly losses during peacetime. Those annual purchases were then multiplied by CBO's estimate of the unit cost for replacing each aircraft.

Uncertainty and Sensitivity of the Estimate. CBO based its estimate of a sustaining budget for major procurement on a number of assumptions, all of which are uncertain to varying degrees.⁶ Those assumptions cover projected inventories, estimates of the ages of equipment at the time of replacement, and costs for replacing systems.

For example, CBO's assumptions about annual purchases of systems, which underlie its estimate of sustaining funding, call for replacing systems on a one-for-one basis. But that might not happen in every case. DoD might find that the services could perform their missions with less equipment than they use today—perhaps because of improvements in the equipment's capabilities. The inventory DoD required for comparable capability would then be smaller and annual procurement costs lower than in CBO's estimate. In fact, DoD has reduced the amount of equipment used for certain missions. (For example, the Navy cut the number of fighter and attack aircraft in its carrier-based air wings from 60 to 48.)

Another crucial group of assumptions underlying CBO's estimate of major procurement are those about retirement ages. CBO's estimate assumed that equipment would be retired at ages consistent with DoD's current plans (see the column in Table 4 labeled "Based on Longer Service Lives"). But in the case of many systems, the services have never kept them for

as long as they now plan to. If shorter service lives—based generally on historical experience—proved to be more accurate indicators of how long systems actually remained in service, then an estimate using those assumptions would better reflect sustaining quantities for major procurement (see the corresponding column in Table 4). Those quantities are much larger than CBO's estimate of the quantities associated with DoD's plans. Consequently, under those shorter-service-life assumptions, CBO's estimate of a sustaining budget would not be sufficient to maintain today's inventories.

In estimating the costs for replacing systems, CBO used the prices that DoD paid for similar units as a base. For some systems, CBO adjusted those prices to reflect expected improvements in technology and growth in costs. However, its assumptions about costs may not be accurate. DoD's analysts, for example, might argue that using historical prices—with or without CBO's adjustments—may overstate costs in the future. The Defense Department and private industry, they might contend, are committed to reducing the cost of procuring major systems—for instance, through so-called lean manufacturing techniques.⁷ In addition, for some missions, the services are planning to buy systems that could be less expensive than a current-system replacement. For example, DoD is considering replacing some manned reconnaissance systems with lower-price unmanned equipment. CBO's estimate does not reflect such possible changes to the composition of DoD's forces.

In contrast to the problem of overstating costs, some of the prices for weapons and equipment that CBO used for its estimate could be too low. Replacements for many current systems are either early in the development stage or not in development at all. Historically, as systems have moved from early stages into full production, their price has grown. As mentioned earlier, some of CBO's estimates of prices for replacement systems include the likely growth of costs. But the estimates may not be high enough to cover the full price of improved capabilities or further modifications.

6. For an alternative estimate based on markedly different assumptions, see Daniel Gouré and Jeffrey M. Ranney, *Averting the Defense Train Wreck in the New Millennium* (Washington, D.C.: Center for Strategic and International Studies and Management Support Technology, Inc., November 1999). Gouré and Ranney's estimate is substantially higher than CBO's. For an estimate of DoD's budget needs that is lower than CBO's, see Steven Kosiak and Elizabeth Heeter, *Cost of Defense Plan Could Exceed Available Funding by \$26 Billion a Year Over Long Run*, CSBA Highlight (Washington, D.C.: Center for Strategic and Budgetary Assessment, April 2, 1998).

7. Those techniques include delivering parts to the production line just before they are needed, thereby reducing storage costs; using computers more efficiently in the design and manufacturing process; and using more generic equipment to assemble systems, which reduces spending on specialized tooling.

Table 4.
DoD's Past Purchases of Selected Equipment and CBO's Estimates of Purchases
Under a Sustaining Budget (By fiscal year)

	<u>Average Annual Purchases</u>		<u>Annual Sustaining-Budget Purchases^a</u>	
	<u>1975-1990</u>	<u>1991-2000</u>	<u>Based on Longer Service Lives^b</u>	<u>Based on Shorter Service Lives^c</u>
Tanks, Artillery, and Other Armored Vehicles	2,083	145	588	883
Helicopters				
Scout and attack	78	7	105	169
Utility	109	69	151	183
Battle Force Ships ^d	19	7	8	11
Aircraft				
Fighter and attack				
Navy	111	42	64	88
Air Force	238	28	89	124
Electronic-warfare	21	7	9	12
Tactical and strategic airlift ^e	31	15	20	26
Tankers	5	1	12	14
Heavy bombers	7	1	3	3
Other ^f	16	0	11	15

SOURCE: Congressional Budget Office using data from the Department of Defense.

- a. The sustaining-budget estimate is CBO's calculation of the annual funding required to maintain U.S. military forces at their current size; to modernize their weapons and equipment at a rate that is consistent with expected service lives and with maintaining a technological advantage over potential adversaries; and to maintain current funding for readiness. It is a steady-state concept and not an estimate of the defense budget for any specific year.
- b. Assumes longer service lives—generally those that underlie DoD's and the services' current projections of inventories.
- c. Assumes shorter service lives that reflect historical experience or more-pessimistic assumptions about how long equipment will last.
- d. Includes all Navy ships involved in combat—for example, ballistic missile submarines, surface combat ships, aircraft carriers, and amphibious craft—as well as some other vessels.
- e. Air Force planes only.
- f. Includes, for example, fixed-wing antisubmarine warfare aircraft and planes for special operations.

Other Procurement. The other part of CBO's estimate for procurement covers equipment and systems for which CBO lacked the data to develop individual cost estimates.⁸ (Examples include some trucks, communications and civil engineering equipment, and am-

munition, as well as programs for modifying existing systems.) CBO's overall estimate of the total costs for all of those systems and programs—almost \$50 billion annually—exceeds the total costs of the programs that procure major systems. The Army's share of the estimated funding for other procurement totals more than \$10 billion, the Navy's almost \$15 billion, the Air Force's more than \$20 billion, and the defense agencies' almost \$5 billion.

8. CBO's category should not be confused with accounts labeled "Other Procurement" in the budgets of the Army, Navy, and Air Force. Although CBO's category includes funds from those accounts, it also includes money for items that are funded through many other accounts.

Estimating Methods. CBO estimated a sustaining budget for purchases of equipment other than major systems by using historical data (for the 1974-1998 period) on total spending for procurement. In particular, CBO based its estimate on the relationship between total current spending on procurement and past spending on equipment similar to the replacement items, as well as on the relationship between spending on major systems and spending on other kinds of procurement.

Uncertainty and Sensitivity of the Estimate. CBO's estimate of the funds needed to sustain DoD's other procurement is uncertain for at least two reasons. First, it is based in part on CBO's estimate of the sustaining funding needed to procure major systems; as a result, it is affected by all of the uncertainties associated with that estimate—specifically, changes in the costs, service lives, and required inventory for individual systems. (For example, if CBO used the shorter service lives described in Table 4 in its calculations, its estimate of \$90 billion for steady-state procurement would increase by \$25 billion.) Second, the estimate for other procurement relies on statistical analysis that is inherently imprecise.

To try to lessen some of those uncertainties, CBO developed alternative methods for calculating a sustaining budget for this category. One approach broke down spending for other procurement into subcategories and developed an estimate for each one using detailed statistical relationships. Like CBO's original approach, that method generated an estimate of about \$50 billion for other procurement funding.

Research, Development, Test, and Evaluation Appropriations

In 2000, the Congress appropriated \$38 billion for the programs that make up the research, development, test, and evaluation (RDT&E) category of DoD's budget. At \$40 billion, CBO's estimate of the RDT&E funding necessary to sustain today's forces is quite close to the appropriations for 2000.

What the Funds Purchase. Appropriations in this title pay for basic and applied research, fabrication of devices for demonstrating new technologies, develop-

ment and testing of prototypes, and testing of full-scale models of weapon systems before they enter production. Development funds also pay for operational testing of systems, when they are first taken into the field and when they are modified during the course of operations.

Estimating Methods. The RDT&E budget title has four major components. The Army, Navy, and Air Force each have RDT&E appropriations (research and development for the Marine Corps is included in the Navy's appropriation); the fourth component takes in DoD-wide programs such as national and theater missile defense. For the three military departments, CBO based its estimate of sustaining funding on the relationship of each department's RDT&E funding to its total budget. First, CBO calculated the shares of their annual budgets that the Army, Navy, and Air Force devoted to RDT&E between 1974 and 1999, the period CBO used for this estimate. The average share of its budget that each service had allocated over the period was then used to compute CBO's estimate of the service's sustaining budget for RDT&E.

Two important considerations support the assumption that estimates of sustaining budgets for research and development should be tied to total sustaining-budget estimates. First, much of DoD's funding for RDT&E pays for the salaries of engineers and scientists employed under defense contracts. Those costs should rise with costs in the civilian labor market and thus should be tied to CBO's estimates of sustaining funding for O&M and military personnel. Second, because most of the funds for RDT&E go toward developing and testing new systems, an estimate of sustaining funding for RDT&E should be linked to the number and costs of DoD's weapon programs—and thus to the total sustaining budget for procurement.

The fourth component of DoD's RDT&E spending is not tied directly to the services' budgets, since it funds DoD-wide research and development activities. The largest of those are the national and theater missile defense programs. Those programs, which have substantially increased DoD-wide research, were established to develop systems to protect the United States and its forces from attacks by enemy missiles. To estimate a sustaining budget for this component,

CBO used the amount appropriated for it in the 2000 budget.

Uncertainty and Sensitivity of the Estimate. CBO's estimate of sustaining funding for RDT&E is highly uncertain. A change of as little as 1 percentage point in CBO's estimate of the RDT&E share of DoD's total budget would lead to a shift of \$3 billion in the sustaining budget for RDT&E. And the RDT&E share of DoD's budgets has varied by more than 1 percentage point in the past. Moreover, an estimating approach that is founded on budget shares links CBO's calculation of a sustaining budget for RDT&E to its estimates of sustaining funding for other appropriations. As a result, CBO's estimate for RDT&E is subject to all of the uncertainties that surround those other calculations.

As the foundation for procuring future weapons and equipment, RDT&E activities—and by extension, funding—should be a function of DoD's plans for those items (for example, when they should be bought or the capabilities they should deliver). Indeed, that connection is the basis for CBO's budget-shares approach to estimating a sustaining RDT&E budget. But determining the exact relationship between plans for future weapon systems and the RDT&E funding that would be needed to implement those plans is very difficult. The relationship can vary widely from system to system, depending, for example, on the specific technologies involved and the schedule for introducing a new system. In principle, CBO's approach might balance those effects across the mix of new systems being planned. But CBO's methods are sensitive to shifts in the shares of funding allocated to RDT&E. The historical variations in those shares, combined with the variations that have occurred in funding for DoD-wide research and development activities, point up the considerable uncertainty in CBO's calculation. For instance, CBO's estimate of about \$10 billion for DoD-wide research and development programs could either over- or understate the funding needed to sustain those activities. Over the past 10 years, funding for DoD-wide RDT&E has varied from about \$9 billion to about \$11 billion (in 2000 dollars).

Military Construction Appropriations

In 1997, DoD operated about 1.7 billion square feet of facilities, ranging from office buildings to schools for the dependents of military personnel to facilities on air bases.⁹ Construction and replacement of those facilities and improvements to them are funded under the military construction title of the defense budget, which also covers many of the costs associated with base closures. In 2000, the Congress appropriated about \$5 billion for this category, and CBO's estimate of a sustaining budget for it is about \$5 billion as well.

Estimating Methods. CBO based its estimate of a sustaining budget for military construction on what DoD spent on facilities in the 1980s. (During the 1990s, rounds of base closings and realignments—shifts of the activities at a variety of facilities—affected this category of funding and made that period less representative.) CBO's estimate of \$5 billion is the average of two calculations that used the 1980s data. In the first calculation, CBO took average spending for military construction per active-duty service member in the 1980s and multiplied that amount by the number of such personnel today. In the second calculation, CBO took average spending in the 1980s per square foot of building space and multiplied it by DoD's current space. CBO's estimate of sustaining funding for military construction makes no provision for the effects of additional rounds of base closures and realignments.

Uncertainty and Sensitivity of the Estimate. As with assumptions made for other categories of appropriations, there is considerable uncertainty about whether relationships for construction spending in the 1980s are the right measure to use in developing CBO's sustaining-budget estimate. Again, as with other estimates, CBO's calculation is quite sensitive to changes in its assumptions. One way to demonstrate that sensitivity would be to compare the two calculations noted above without averaging them together.

9. The figure of 1.7 billion square feet represents buildings at facilities for both active and reserve components of the services. The last year for which complete data were available from DoD was 1997.

Using only the approach based on spending per square foot results in an estimate that is about 15 percent greater than CBO's averaged estimate. And using the approach based on spending per active-duty service member produces an estimate that is about 15 percent less than the average.

Family Housing Appropriations

Appropriations for family housing in 2000 totaled about \$4 billion, and CBO's estimate of sustaining funding for that budget title is the same. The appropriations finance the costs of constructing, improving, operating, maintaining, and leasing military family housing units.

Estimating Methods. CBO's assumptions about military family housing began with the premise that DoD would continue to maintain its current inventory of housing units. CBO also assumed that operation and maintenance costs for the units would match those for 2000. The new construction that each military department would need each year to sustain its forces was estimated by taking the portion of the inventory that the department owned and dividing it by 50 years—a unit's assumed service life. CBO estimated that a new unit would cost slightly more than \$150,000, on average, to construct and that each unit would be revitalized once during its life at an additional cost of roughly \$80,000. (Those costs are actual averages from the 1998-1999 period.)

Uncertainty and Sensitivity of the Estimate. In constructing its estimate, CBO assumed that DoD would continue to rely on publicly funded construction to maintain its housing stock. Recently, however, DoD has begun to broaden the private sector's involvement in constructing and maintaining its family housing. If DoD increased that involvement in the future and consequently produced substantial savings, a sustaining budget for family housing might be lower than CBO has estimated. If DoD eliminated any current deficits in family housing, it might need more money than CBO has estimated.

CBO's Estimate of a Sustaining Budget for Defense Activities in Other Agencies

In addition to the Department of Defense, other federal agencies conduct programs or activities that contribute to national defense. In 2000, the Congress appropriated approximately \$13 billion for those activities, allocating more than \$12 billion to the Department of Energy (budget subfunction 053) and \$1 billion to other agencies (budget subfunction 054). CBO's estimate of a sustaining budget for the activities covered under both of those categories also totals \$13 billion.

What the Funds Purchase

The Department of Energy (DOE) uses its funds to maintain stockpiles of U.S. nuclear weapons and develop technologies to better detect, identify, and respond to the proliferation of nuclear and other weapons of mass destruction. DOE's funding also pays for environmental cleanup of sites that formerly contained facilities for producing nuclear weapons. Funds for other agencies support diverse activities that range from overseas deployments of the Coast Guard and its enforcement of U.N. sanctions to counterintelligence and surveillance activities by the Federal Bureau of Investigation.

Uncertainty and Sensitivity of the Estimate

CBO has not evaluated potential changes to funding for the above activities in any detail, and as a result, its estimate of sustaining funding is particularly uncertain. One factor that could drive up DOE's budget requirements is higher-than-expected costs for cleaning up some facilities. CBO, however, has not performed a detailed analysis of such potential budgetary pressures.

The Limitations of CBO's Estimate

As the Congress debates future defense budgets and evaluates proposals for future strategies and missions, CBO's analysis and estimates of a sustaining budget could prove to be useful. But several limitations of CBO's work should be noted.

First, the estimates presented here do not apply to the period for which DoD typically constructs detailed plans. For example, CBO's estimates of sustaining funding for procurement reflect the cost of a number of weapons and systems that either are not yet in production or are in production only at initial low rates. Thus, CBO did not estimate the level of procurement DoD would require in the near term. In fact, as noted earlier, CBO's estimates are not associated with any specific budget year.

Second, because CBO based its estimates on methods that used broad totals as their foundation, the estimates are also broad. As a result, CBO's numbers are not specific enough to be used in a formal cost estimate of the type that CBO prepares for legislative proposals.

Third, and most important, CBO has not evaluated the current national security strategy and the threats it is intended to counter, nor has it assessed whether the forces and the goals for modernization that are now in place adequately support that strategy.

In fact, today's national security strategy has been the subject of considerable debate. Some observ-

ers argue that its two-war focus overstates the conventional combat forces that DoD needs to sustain. Others contend that DoD requires larger forces than those in place today because the strategy also emphasizes smaller-scale contingencies and peacetime presence and those operations add to the forces needed for combat. Next year, a new Administration could markedly change the country's national security strategy. And that might significantly change the numbers and kinds of forces DoD would need to maintain and the budget that would be required to build and sustain them. But even if today's strategy continued to form the basis for the defense requirements of a new Administration, the forces that constitute the current U.S. military might not be able to support that strategy. The leaders of the military services and others have suggested that the military is being asked to do more than its current forces can sustain. This analysis does not address that issue but only the question of what funds are necessary to maintain those forces in the future.

CBO's analysis also does not take into account any alterations that DoD and the Congress might make in the military's support services or DoD's infrastructure. Even if plans for strategies, forces, and modernization remained substantially unchanged, such alterations could affect CBO's estimate of sustaining funding. If DoD reduced the number of bases it operated, for example, or improved its business practices to provide services more efficiently, those changes could decrease the sustaining budget for a given level of forces. Conversely, increasing support services or enhancing infrastructure could increase DoD's long-term operating costs. CBO's analysis does not reflect those possibilities.

Alternative Defense Forces and Budgets

The gap between current defense budgets and the Congressional Budget Office's estimate of the funding needed to sustain today's military offers a challenge to future policymakers. In broad terms, they have two options for eliminating that gap: they could either bring the amount of the sustaining budget down to today's level of funding—by cutting specific programs or forces or by paring down their missions—or they could increase funding for defense.

This chapter discusses both of those approaches. For example, it includes selected examples of possible reductions directed at each of the major determinants of the defense budget discussed in Chapter 1. But defense officials could also change the nation's strategic goals and its respective priorities, which might lead to decisions to reduce forces or cut investments in modernization related to lower-priority missions. CBO illustrates that option for closing the gap by developing two alternative force structures that each emphasize one or the other of the Department of Defense's major strategic goals—preparing for regional conflicts (specifically, major theater wars) and pursuing peace operations. An across-the-board cut to DoD's forces and programs is a further option available to policymakers, as is increasing the defense budget to the level of funding that CBO estimates is needed to sustain today's military.

CBO's alternatives are only broad renderings of different approaches to eliminating a funding gap. To make the detailed changes associated with a major restructuring of U.S. strategic priorities would require policymakers to thoroughly review possible threats to

the nation's security (both now and in the future), the appropriate strategy to counter them, and the budgetary implications of decisions about those matters. Such a review could lead to changes in forces, levels of readiness, and plans for modernization. Without that review, estimates of the cost of alternative strategies are merely illustrative, and actual requirements for national defense cannot be calculated.

Reducing Budget Requirements

To close the gap between current defense funding and CBO's estimate of a sustaining budget, future policymakers may seek to change the requirements that generate the defense budget request. They could do that by cutting specific programs, changing strategic priorities, or instituting an across-the-board cut in all defense programs.

Reducing Specific Budget Categories

Cuts to one or more of the major categories of DoD spending—forces, investment, or infrastructure—would be one way to significantly reduce the resources needed to sustain the U.S. military. CBO evaluated a number of such options in its March 2000 report *Budget Options for National Defense*, calculating potential savings over the 2001-2010 period. The examples

that follow are selected from that volume; here, however, savings from the options are expressed in 2000 dollars rather than the current dollars used in the defense options report.¹

Forces. In preparing that volume, CBO examined the costs and implications of cutting several types of major combat forces—for example, reducing the numbers of Army National Guard divisions, Navy attack submarines and aircraft carriers, and tactical fighter wings in the Air Force. Average annual savings from implementing those options would range from about \$0.5 billion (for eliminating two Army National Guard combat divisions) to \$2.2 billion (for cutting two carriers and their air wings). Savings from trimming National Guard divisions and tactical fighter wings reflect only operating costs; however, CBO's option for cutting the number of carriers also includes savings from reducing procurement. Declines in operating costs alone from eliminating two carriers and their air wings would average \$1.4 billion annually. Operating savings from cutting two Air Force tactical fighter wings would average about \$0.6 billion.

Investment. Although the Defense Department is not buying sustaining quantities of most types of military equipment, it is developing or buying a number of new weapon systems. They include the Army's Comanche helicopter and Crusader artillery system, aircraft carriers and attack submarines for the Navy, and the Air Force's F-22 fighter and C-17 airlift aircraft. Canceling or cutting back any of those programs would reduce the funding required for procurement or development, or both. Average annual savings over the 2001-2010 period could range from about \$0.5 billion (for canceling the Comanche) to \$3.8 billion (for canceling the F-22).

Infrastructure. Making its support activities more efficient is another way that DoD could save money and reduce the resources needed to maintain its forces in the future. A large share—more than half—of DoD's funding is found in categories related to infrastructure, according to the Defense Department. Cutting the costs of those activities may be an option that

future Administrations and Congresses would choose to pursue regardless of other cuts (to forces and investment, for instance) that they decided to make.

Maintaining national security at the lowest price to taxpayers is, of course, a widely shared objective. CBO evaluated several approaches to reducing the military's support costs in *Budget Options for National Defense*; the options included revamping the military medical system, closing more bases, restructuring some benefits that active-duty personnel now receive, and consolidating DoD's retail facilities. CBO's estimates of average annual long-term savings from such options reached as much as \$1.6 billion (for downsizing the military medical care system).

Yet despite their potential for savings, efforts to make support operations more efficient are unlikely to resolve all of DoD's budget problems. Most of the savings from individual options in this category would amount to less than \$0.5 billion annually; in some cases, the savings would be much less. Also, whether such changes could be instituted at all is questionable. Many efficiency measures of this kind—including some of the options CBO evaluated, such as base closures—have proved to be quite difficult to implement.

Changing Strategic Priorities

Many of the options discussed above would substantially reduce the funding that CBO estimates DoD would need to sustain its forces. But a number of those changes would have to be undertaken together to bring CBO's estimate of a sustaining budget down to the level of DoD's funding for 2000. A systematic approach to such reductions would reassess the national security strategy, rank the military's missions in the light of that reassessment, and reduce spending on forces and modernization programs associated with missions of lower priority. The following alternatives illustrate two ways in which that spending could be cut.

Alternative I: Emphasize Peace Operations. Increasing the priority of military missions that CBO has labeled peace operations would probably mean a shift in the distribution of forces that the military

1. Current dollars reflect future inflation. Those effects must be removed—that is, the savings must be converted to 2000 dollars—before the amounts in the options can be compared with the figures in this study.

Table 5.
Selected U.S. Military Forces Under Current and Alternative Strategic Priorities

	Forces Under Current Strategic Priorities ^a	Forces Under Alternative Strategic Priorities	
		Emphasize Peace Operations	Emphasize Major Theater Wars
Army Divisions			
Active	10	8	10
Reserve	8	5	5
Navy Carrier Battle Groups ^b	12	12	12
Marine Corps			
Amphibious ready groups ^c	12	12	12
Expeditionary forces ^d			
Active	3	3	3
Reserve	1	0.7	1
Air Force Tactical Fighter Wings			
Active	12.6	9.3	12.6
Reserve	7.6	5.1	7.6
Memorandum: Sustaining-Budget Estimate (Billions of 2000 dollars of budget authority)	340	320	325

SOURCE: Congressional Budget Office.

- a. Today's strategic priorities encompass what CBO has termed peace operations (such as humanitarian assistance, peacekeeping, and peace enforcement) and major theater wars.
- b. A carrier battle group includes an aircraft carrier and its air wing, along with surface combat ships, attack submarines, and logistics ships.
- c. An amphibious ready group comprises several amphibious ships (including one that can carry attack aircraft and a variety of helicopters) that transport Marines and their equipment.
- d. A Marine expeditionary force includes a division, an air wing, and supporting forces for those combat elements.

maintains. Some military units—in particular, some noncombat units—would need to be increased or at least retained at their current level.² Units that are heavily involved in peace missions include the Navy's carrier battle groups, amphibious ready groups in the Marine Corps, certain support and administrative elements of the Army's divisions and corps, and surveillance and reconnaissance aircraft in the Air Force. This alternative would retain those units at current

levels (see Table 5). At the same time, it would cut some traditional combat forces, including five Army divisions (two active and three reserve) and almost six tactical fighter wings (including two and a half from the reserves) in the Air Force.

In developing this alternative, CBO assumed that its estimate of steady-state quantities for procurement would decline in proportion to the reductions in forces. Thus, Alternative I would pare back the level of purchases under a sustaining budget for ground combat equipment, including tanks, attack helicopters, and artillery systems. It would also reduce sustaining purchases of fighter, ground attack, and multirole aircraft.

2. See General Accounting Office, *Impact of Operations Other Than War on the Services Varies*, NSIAD-99-69 (May 1999), for a discussion of the variation in the effects of peacekeeping operations on units' readiness.

In contrast, the alternative would maintain purchases of a variety of systems that have been heavily used in recent peace operations including utility helicopters and trucks for the Army and airlift aircraft, tankers, and reconnaissance aircraft in the Air Force. Because CBO did not assume that any programs would be eliminated, it also assumed that RDT&E funding would not be cut.

As a result of lower costs for operations and modernization, the sustaining budget for Alternative I is smaller than the sustaining budget associated with today's forces. CBO estimates that the total sustaining budget for this alternative is about \$320 billion—approximately \$30 billion more than the budget for 2000 but \$20 billion less than the amount CBO estimates is required to sustain and modernize today's forces.

Alternative II: Emphasize Major Theater Wars.

Some defense experts believe that the services' most important mission is to be ready to go to war, not to perform peace operations. If DoD decided to emphasize the conventional capabilities necessary to fight two regional wars, it might choose to preserve most types of combat forces—specifically, units with a great deal of firepower, such as tank battalions, conventional attack wings, and strategic bomber squadrons—at today's levels (see Table 5). However, this option would cut three divisions of the Army National Guard because those units are not included in DoD's current plans for fighting two major theater wars.

Basically, this alternative would preserve the military's current force structure, but it would rely much more than do current plans on using today's weapons to equip those forces. The relatively unsophisticated warfighting capabilities of potential regional foes are one justification for such a move. Another would be the possibility of avoiding the problems of aging equipment by buying newly built current-generation weapons and curtailing purchases of new, more-

sophisticated weapons.³ For example, this alternative would purchase F-15s and F-16s for the Air Force's tactical fighter forces instead of more-advanced F-22s and Joint Strike Fighters. It would also purchase the cheaper OH-58D helicopter instead of the light-attack Comanche helicopter that is part of the Army's current purchasing plan.

A sustaining budget for this alternative totals about \$325 billion a year, CBO estimates. That sum is about \$15 billion less than the sustaining-budget estimate associated with today's planned forces and about \$35 billion more than the appropriation for 2000. Compared with the first alternative, this option would keep far more forces at a modestly higher cost. However, the fact that changes of the extent described under both alternatives still would not bring the total for a sustaining budget down to today's level of funding illustrates the complexity of the problem that decisionmakers face.

Reducing DoD's Forces, Programs, and Activities Across the Board

Spreading cuts across all parts of the defense establishment is another alternative for closing the gap between today's defense funding and CBO's estimate of sustaining funding. Although reducing budgets in that way might seem an unlikely approach for DoD, the department has frequently spread cuts broadly in the past, perhaps finding it easier to impose reductions everywhere rather than direct cuts toward specific areas. By dispersing cuts, DoD may also preserve more kinds of capabilities than it would if it targeted reductions.

But across-the-board cuts have disadvantages as well. Overall, they probably cut forces and purchases

3. Such an approach would still provide considerable modernization. The aircraft, ship, or tank built today is often much improved from the original model of one or two decades before, even though today's system carries the same designation (for example, F-16 or M1).

more deeply than would cuts that result from reducing specific programs. That is because the savings from canceling complete systems can be greater than the savings from reducing the quantities purchased by a number of programs. In addition, some portion of DoD's costs probably does not vary with reductions in its forces. (For example, if a unit such as a squadron or part of a brigade was cut, operating costs for the base at which the unit was located might not decline by much.) Making across-the-board cuts to forces without proportional cuts in DoD's infrastructure can also mean that the operating cost per unit will increase. One of CBO's earlier analyses suggests, for example, that the Air Force could operate more fighters without increasing its budget if it did so from fewer bases.⁴

CBO estimates that DoD would need to cut roughly 25 percent of today's forces to reduce its total sustaining budget to \$290 billion (the defense appropriation for 2000, excluding supplemental funding). That kind of reduction would mean cutting more than two divisions in the active Army, three carrier battle groups in the Navy, and the equivalent of more than three active fighter wings in the Air Force. Such cuts are smaller than the reductions in forces that occurred during the 1990s. Nevertheless, they would have a substantial effect on the capability of U.S. forces because the cuts would be taken from today's smaller military. As a result, some defense leaders believe that cuts of the magnitude described above would leave DoD's forces smaller than the forces necessary to fight two major theater wars.

Across-the-board reductions would also lessen the military's investment in modernizing its forces. Funding for research and development would fall to about \$34 billion under this approach, making it likely that DoD would pursue fewer programs to develop

new technologies than it would have otherwise. And despite the budgetary benefits of across-the-board cuts in programs for weapon modernization, that approach would do little to resolve the department's problem of ever-older fleets of equipment and weapon systems.

Increasing the Defense Budget to Equal CBO's Estimate of a Sustaining Level for Today's Forces

The gap between DoD's current budget and the funding that CBO estimates would sustain today's military could also be closed if the defense budget grew. If the Congress and the President boosted funding for national defense to \$340 billion (CBO's overall estimate of a sustaining budget), that funding would be about \$50 billion a year higher than the appropriations for 2000. Most of the increase—about \$30 billion—would go toward procurement. Nearly all of the remaining \$20 billion would be split evenly between the categories of military personnel and operation and maintenance. (As noted in Chapter 2, the latter amount reflects a boost in real compensation over the 2001-2015 period to keep increases in military and civilian pay comparable with pay increases in the private sector. Consequently, CBO's estimate may overstate the near-term increase required for a sustaining budget but understate the funding required over the longer term.)

Many advocates of increased spending for defense argue that not just more money but additional forces and weapon programs are needed. CBO, however, did not analyze the effects of those kinds of changes to current forces.

To consider increasing the defense budget may seem plausible with the federal budget in surplus. CBO's most recent baseline projections of cumulative

4. Statement of Robert F. Hale, Assistant Director for National Security, Congressional Budget Office, before the Subcommittees on Conventional Forces and Alliance Defense, on Manpower and Personnel, and on Readiness, Sustainability, and Support of the Senate Committee on Armed Services, May 16, 1989.

on-budget surpluses over the next 10 years range from \$2.2 trillion, when discretionary appropriations are adjusted for expected inflation, to \$3.3 trillion, when discretionary appropriations are frozen at today's level.⁵

But those projected surpluses are far from assured. Relatively small changes in the economy could shift the budget's balances up or down.⁶ And even if large surpluses materialized, they would not guarantee big additional sums for defense because the military

would be competing with many other claimants for those funds. CBO's *Budget Options* volume discusses several possible uses of the surplus, which include cutting taxes, improving benefits for Medicare recipients, and providing more support for education programs.⁷ Increased spending on nondefense programs or reductions in revenues through tax cuts could make increases in defense spending less likely.

5. Congressional Budget Office, *The Budget and Economic Outlook: An Update* (July 2000), p. 2. Those amounts are in current dollars rather than the constant dollars used for the other budget estimates in this study.

6. For example, CBO estimated the effects of making more pessimistic or more optimistic assumptions in its January 2000 report *The Budget and Economic Outlook: Fiscal Years 2001-2010*.

7. See Congressional Budget Office, *Budget Options* (March 2000). Chapter 1 of that volume discusses a number of expansions to the scope of federal activities that policymakers have proposed, many of which could add significantly to spending in parts of the federal budget other than defense. Such proposals cover revisions to Social Security and Medicare, ways to increase the number of people covered by health insurance, increases in long-term care for the elderly, and improvements in education. Chapter 2 discusses a variety of changes to the U.S. tax code. Most of those changes would decrease taxes and therefore federal revenues, at least in the near term, although some changes could improve economic performance over the long run.