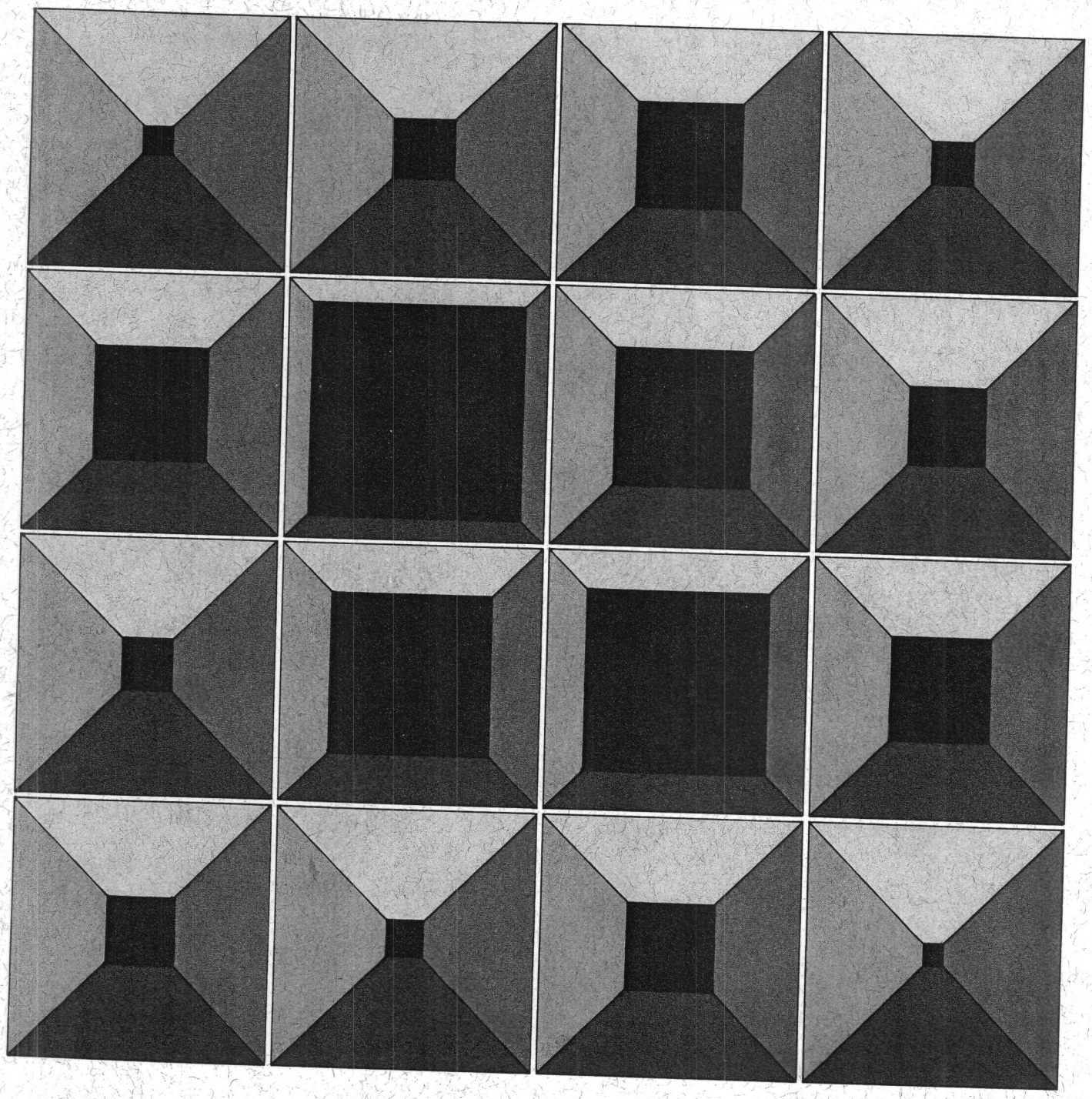
Resources for Defense: A Review of Key Issues for Fiscal Years 1982–1986

A CBO Study
January 1981

Congress of the United States
Congressional Budget Office



Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
JAN 1981		**00-00-1981 to 00-00-1981**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Resources for Defense: A Review of Key Issues for Fiscal Years 1982-1986	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Congressional Budget Office,Ford House Office Building, 4th Floor ,Second and D Streets, SW ,Washington,DC,20515-6925**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**166**	

RESOURCES FOR DEFENSE:
A REVIEW OF KEY ISSUES
FOR FISCAL YEARS 1982-1986

The Congress of the United States
Congressional Budget Office

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

NOTE: Unless otherwise indicated, all costs in this report are in constant fiscal year 1982 dollars, all cost estimates represent budget authority, and all years are fiscal years.

PREFACE

Reflecting recent international developments and concerns about the capability of U.S. forces, the Congress provided a substantial real increase in defense budget authority for fiscal year 1981. The President's budget request for fiscal year 1982 proposes further real increases. As the Congress considers appropriate levels of defense spending for fiscal year 1982 and beyond, one of its key concerns will be allocating any further increases among competing defense requirements.

This defense debate will probably revolve around four key issues:

- Are improvements needed for U.S. strategic forces?
- Are improvements needed for conventional forces, particularly to enhance "readiness"?
- How should resources be allocated between conventional forces supporting NATO and those required for operations outside Europe?
- What are the prospects for maintaining a high-quality all-volunteer force?

Undertaken at the request of the House Budget Committee, this report reviews a selection of program alternatives that illustrate how different approaches to addressing these four issues would affect defense budgets for fiscal years 1982-1986. Its point of departure is the CBO "baseline" projection of the defense budget, which derives from Congressional action on the President's budget submission for fiscal year 1981. A subsequent paper will evaluate the Defense Department's budget request for fiscal year 1982 in light of the findings of this report. In keeping with CBO's mandate to provide objective and nonpartisan analysis, this report offers no recommendations.

Dov S. Zakheim directed preparation of the report, under the general supervision of David S.C. Chu and Robert F. Hale. The following members of the National Security and International Affairs Division of CBO contributed to the study: Rich Davison,

John Enns, John Hamre, Pat Hillier, Marshall Hoyler, Dan Huck, Lorin Kusmin, Jennifer Hinman, Eileen Maguire, Joel Slackman, Nora Slatkin, Michael Sullivan, Nancy Swope, and Peter Tarpgaard. Edward Swoboda, Mick Miller, Alice Hughey, and Tom Phillips, of CBO's Budget Analysis Division, provided the defense baseline and participated in developing cost estimates, under the supervision of Patrick Renehan. Valuable assistance was also provided by Patricia Johnston, who edited the manuscript, and Pierce Johnson, both of CBO; and by Lawrence Korb, of the American Enterprise Institute for Public Policy Research; John Steinbruner, of the Brookings Institution; and Leonard Sullivan, Jr. (Responsibility for the report rests solely with CBO, however, and not with any outside reviewers.) Nancy Brooks, Jean Haggis, and Janet Stafford prepared the report for publication; the graphics were drafted by Andrew Hemstreet and his colleagues at Art Services, Inc.

Alice M. Rivlin
Director

January 1981

CONTENTS

CONTENTS (continued)

TABLES

TABLES (continued)

TABLES (continued)

APPENDIX TABLES

APPENDIX TABLES (continued)

FIGURES

SUMMARY

Congressional debates over the fiscal year 1982 defense budget are likely to differ markedly from those of the 1970s. Since a consensus now exists to increase defense spending, the critical question this year will be: How should the spending increases be allocated?

The Congress will probably focus on four major areas:

- What can be done to improve U.S. strategic capabilities?
- Are improvements in general purpose forces also needed--particularly to enhance "readiness"?
- Should general purpose force improvements be directed primarily toward the European theater, or should non-NATO requirements be given higher priority?
- Will the United States succeed in maintaining a high-quality, all-volunteer force?

This report reviews a selected group of issues that illustrate how different approaches to resolving these four concerns would affect defense budgets over the next five years. The point of departure is CBO's "baseline" projection of the defense budget for fiscal years 1982-1986. The baseline includes all programs approved by the Congress for fiscal year 1981, and assumes that they are carried out according to the five-year schedules presented to the Congress by the Department of Defense (DoD). The baseline would require budget authority of $196 billion in 1982 for all defense programs. Budget authority would grow from 2.2 percent to 3.2 percent a year through 1984 (see Summary Table 1). (Except as noted, all costs in this report are budget authority in fiscal year 1982 dollars.)

The report reaches the following broad conclusions concerning U.S. defense forces.

Strategic Nuclear Forces. The Congress has initially funded a number of strategic force improvements, but most of them would not enhance strategic posture until the late 1980s or beyond. Despite concern over near-term strategic capabilities, very few

SUMMARY TABLE 1. CBO BASELINE DEFENSE PROGRAM, FISCAL YEARS 1981-1986 (In billions of fiscal year 1982 dollars)

Forces	1981	1982	1983	1984	1985	1986
Strategic Force Costs	15.6	18.1	24.9	29.1	30.9	28.3
Other Costs	174.4	178.0	177.2	177.4	175.9	171.1
Total	190.0	196.1	202.1	206.5	206.8	199.4

new programs could improve U.S. capabilities over the next five years. Thus, the major decisions facing the Congress may involve changes to programs that are already under way, such as the highly controversial basing system for the MX land-based missile.

To augment near-term capabilities, this report considers increasing the alert status of the strategic bomber force. To hedge against delays in MX deployment, the report examines accelerating the Trident II submarine-launched missile program. To ensure effective command and control of U.S. strategic forces, it reviews a series of relatively inexpensive but critical improvements. Together, these changes could add $4.4 billion to baseline budget authority over fiscal years 1982-1986.

NATO Programs. Given the strategic force initiatives already under way, the Congress may wish to concentrate on programs that could strengthen NATO's ability to deter or, if necessary, conduct a major war against the Warsaw Pact. Such programs could include prepositioning additional U.S. equipment in Europe to increase capability early in a war, adding as many as five Army divisions to the U.S. force structure to bolster European defenses in a longer conflict, and increasing U.S. shipbuilding to meet the demands of European as well as non-NATO contingencies. Over the next five years, these programs would add $59.8 billion to baseline budget authority, paced by the costs of adding the Army divisions. The desirability of these additions may depend on the willingness of the NATO allies to increase their own defense budgets substantially, since the programs are assumed to be part of a coordinated NATO plan.

Non-NATO Programs. The Rapid Deployment Joint Task Force (RDF) provides the primary U.S. capability for contingencies other than a major NATO/Warsaw Pact war. Yet little budget authority has been added specifically for the RDF. The Congress may wish to improve the ability of the RDF to enter an area against enemy opposition and to fight and support itself once there. Such enhancements--including more amphibious shipping, lightweight armored vehicles, and additional support troops--could add $9.7 billion to baseline budget authority over the next five years.

Active-Duty Manpower. The numerous pay increases enacted by the Congress for fiscal year 1981 should substantially improve retention of career personnel. While some career retention problems remain, attracting enough high-quality enlisted recruits may be the most pressing problem in the next few years. Increases in bonuses to improve recruiting, and to enhance career retention, could add as much as $5.4 billion to baseline budget authority over the next five years. Meeting the same goals with across-the-board pay raises would cost substantially more.

Taken together, the programs discussed above could increase budget authority over the next five years by $79.3 billion above the baseline. All these additions could be accommodated by a defense budget that grows in real terms by an average of 4 to 5 percent a year over the next five years, though growth rates in early years would be higher. The Congress may, of course, wish to add other programs that would push up budget authority even more. Nonetheless, this report suggests that a wide array of additional programs could be implemented, even if economic constraints hold real increases to about 5 percent a year.

The sections below provide more details on these programs. In particular, those programs that would improve defense capabilities in the near term (that is, within the next five years) are distinguished from those that could bolster U.S. capability only in the longer run.

STRATEGIC FORCES

Despite a lack of consensus on the overall U.S./Soviet strategic force balance, there is widespread concern about the trends in U.S. capabilities, particularly the vulnerability of U.S. land-based missiles to a Soviet first-strike attack.

In response to these concerns, the Congress has begun to fund a number of programs that, if implemented, will increase U.S. strategic capabilities substantially. These programs would improve all three legs of the strategic nuclear "triad." For the sea-based forces, the Congress has funded procurement of the Trident submarine, which will replace all Polaris submarines and eventually all Poseidon submarines, and of the Trident I missile, whose range and warhead yield exceed that of the Poseidon missile. It has also provided development funds for the Trident II missile, whose yield and accuracy would be designed to exceed those of even the Trident I.

To enhance the strategic bomber portion of the triad, the Congress has funded programs that will provide the 20-year-old B-52 bomber fleet with newly developed air-launched cruise missiles. The Congress has also provided initial research and development funds to support the introduction of a new manned strategic bomber by 1987.

Finally, in response to growing evidence of the vulnerability of the Minuteman land-based intercontinental ballistic missiles (ICBMs), the Congress has funded development of the MX missile. The MX would be larger and more accurate than the Minuteman; it is also expected to be better able to survive a Soviet first strike if deployed in a special system of multiple protective structures, a proposal that has sparked considerable controversy. The Congress has also provided funds for continued development of ballistic missile defense technologies, including a new low-altitude air defense system that could be employed in conjunction with the MX or other ICBMs.

As a result of these programs, the baseline projection of strategic budget authority rises by about 80 percent in real terms between 1981 and 1986, reaching more than $28 billion by 1986 (see Summary Table 1).

Few Near-Term Improvements Available

While some of these programs will enhance U.S. strategic capabilities in the next five years, many will only have longer term effects. Yet at least some analysts believe that the probable strategic balance between the United States and the Soviet Union in the next few years demands more near-term improvements.

The quickest way to enhance U.S. strategic posture is to place a greater portion of strategic bombers on day-to-day alert. Raising the alert rate from 30 to 40 percent, for example, would permit as many as 480 more nuclear weapons to be added to day-to-day alert status. This would improve U.S. capability against a no-warning Soviet attack at a cost of $0.8 billion over the next five years.

Other proposed near-term improvements are unlikely to have much effect within the next five years, however. For example, if FB-111 and F-111 fighter/bomber aircraft were modified to carry a larger number of nuclear weapons, the first squadron of aircraft could not be available until 1984 or later. Similarly, the basing of Minuteman III missiles in a multiple protective structure system akin to that proposed for the MX might not permit initial operational capability to be achieved within the next five years.

Problems with the MX May Force Changes in Longer-Term Programs

There is general agreement within the Congress about the need for longer-term strategic force modernization. Despite Congressional funding for a variety of longer-term initiatives that will enhance all three legs of the triad, a number of key issues remain. The long-run costs of the MX missile system could grow sharply, particularly if the Soviet Union responds to deployment of the MX with a major strategic buildup of its own. Long-run investment costs could reach $60 billion or even much more, if the United States counters such a Soviet buildup by expanding the size of the MX system.

Adding to problems of possible cost growth are a variety of environmental factors that could seriously delay or even preclude deployment of the MX missile, at least in its currently proposed basing system. One solution to the problems raised by the MX might be a scaled-down basing system, coupled with an anti-ballistic missile (ABM) system to protect the missiles. (The Congress provided funding in fiscal year 1981 for continued ABM research and development.) Implementation of an ABM system in conjunction with the MX would, however, involve technical risks as well as requiring abrogation of the anti-ballistic missile treaty with the Soviet Union.

To hedge against problems with the MX, the Congress might wish to consider accelerating the Trident II submarine-based

missile program. The Trident II would be designed to have some ability to destroy hardened targets, such as missile silos, which is one important capability of the MX missile. Accelerating the Trident II program to achieve initial operating capability by mid-1988 would add $1.4 billion to baseline budget authority in fiscal years 1982-1986.

Cost-Effective Mix of Tankers Another Longer-Run Issue

Decisions about missile systems will not be the only strategic force issue confronting the Congress. The Air Force has proposed to install more fuel-efficient engines in its current fleet of KC-135 tankers, which provide aerial refueling both for the strategic bomber fleet and for tactical aircraft. The Air Force has also proposed procurement of a new, larger tanker, designated the KC-10. The Congress may wish to review whether both systems are needed to meet future tanker requirements. Preliminary CBO findings indicate that the KC-10 is the more attractive alternative, especially if most additional tanker requirements would be to support conventional operations, such as those of the Rapid Deployment Force.

Improvements in Command, Control, and Communications Affect Both Near- and Longer-Term Capabilities

Regardless of other decisions about strategic forces, the Congress may wish to consider funding a set of relatively inexpensive, but critical, proposals for enhancing strategic command, control, and communications (C^3), an area that some observers consider to be the weakest link in the U.S. strategic force posture.

Proposals for C^3 improvement, which affect both near- and longer-term strategic capability, fall into two broad categories. One alternative would be to improve the capabilities of the current system to function during the course of an initial strike against the United States, which could last for as little as a few minutes or considerably longer. This option would procure warning systems to provide more timely and accurate information about an attack, and better command posts and communications links to improve control over the firing and targeting of U.S. missiles. The acquisition of such a package of systems could add $1.5 billion to the baseline over the next five years.

A major disadvantage of this set of proposals is that they would not significantly improve system endurance. Land-based

facilities would remain vulnerable to quick destruction, and aircraft would be unable to operate for more than a few days after a nuclear attack. Yet current U.S. strategic doctrine requires some ability to endure and wage a protracted nuclear war, and endurance might also contribute to deterrence. Recognizing the advantages of endurance, the Congress could fund new systems, such as mobile ground command posts and communications systems, to enhance C^3 survivability. This second approach would add $0.6 billion to the baseline over the next five years.

Because the two approaches are complementary, the Congress may wish to support both, at a cost over the next five years of $2.2 billion--less than 2 percent of baseline strategic spending.

GENERAL PURPOSE FORCES: NATO-RELATED ISSUES

The large number of strategic force improvements already being funded by the Congress suggests that major new funding initiatives might apply primarily to general purpose forces. These forces are sized to meet the demands of what is termed a "one and one-half war" strategy. The larger part of these forces is committed to the "full war," usually assumed to involve NATO's defense of Europe in a conflict with the Warsaw Pact. The remaining forces are required for operations in other contingencies.

The Warsaw Pact appears to have a substantial conventional force advantage over NATO. The advantage derives in part from the Pact's favorable ratio of tanks (2.7:1), armored personnel carriers for infantry (1.2:1), and artillery (2.2:1). To remedy this force imbalance and other alliance-wide deficiencies, the NATO member countries agreed in 1977 to a Long-Term Defense Program (LTDP). Under the LTDP, the allies are pledged to seek to achieve 3 percent annual real growth in their defense budgets over the five years covered by the program. A major initiative in the program attempts to enhance the United States' ability to reinforce NATO immediately after a mobilization. Future U.S. contributions to this program, which may depend critically on the willingness of the other allies to make corresponding increases, could include a number of programs discussed below.

Additional Prepositioning of Equipment Might Enhance Capability Early in a War

Under the POMCUS program, the United States prepositions equipment in Europe in order to speed the deployment of U.S.-based

Army divisions in the event of a war. The divisions remain in the United States in peacetime and have duplicate sets of equipment there for training. Four division sets of equipment are now prepositioned, and DoD had proposed that two more sets be prepositioned by 1982. CBO has found that the POMCUS program may be underfunded, however. Additional equipment is needed to prevent the further drawdown of equipment levels in the United States. Additional prepositioned war reserve stocks must also be provided, as must a logistics base for the Northern Army Group. Assuming that four division sets would be prepositioned, correcting these funding shortfalls would add $2.9 billion to baseline costs over the next five years.

Prepositioned equipment is vulnerable to a no-warning attack, however, and would be of diminished importance in a conflict preceded by a warning period measured in weeks rather than days. One alternative would keep equipment in the United States but would purchase additional fast sealift ships, at a cost of $4.0 billion, to transport that equipment to Europe in the event of a war. Another alternative would fund POMCUS fully and add two U.S.-based divisions to the Army at a cost of $14.2 billion above the baseline over the next five years. Assuming accompanying force increases by the allies, this program would not only substitute for POMCUS requirements beyond four divisions, but would also allow NATO to conduct an "elastic" defense that would trade territory for time during the initial days of a conflict.

Proposals have also been discussed to prestock equipment for a Marine Amphibious Brigade in Norway and for a mechanized Marine division in Denmark. Prestocking equipment in Norway could add $209 million to baseline costs; prestocking equipment in Denmark, $1.5 billion. Because the Marines have other missions, however, particularly amphibious projection tasks associated with the Rapid Deployment Force, the Congress may decide that the NATO allies should provide the bulk of additional defenses required for NATO's northern region.

Other Measures Might Increase Readiness and Combat Availability

The Congress may wish to consider two other near-term programs that emphasize the readiness and availability of forces for combat. It could provide $1.3 billion in additional funding over the next five years for spare parts for Air Force tactical aircraft. This would permit the Air Force to achieve, by 1983, its target of having 70 percent of its aircraft available to perform their primary mission. This increase is but one example of readiness improvements that may be needed throughout the services.

The Congress could also provide $0.7 billion over the next five years to support the homeporting of a carrier in a Mediterranean port. This program would ease the strain imposed on the carrier force by worldwide deployment demands, and would ensure the availability of a carrier in the Mediterranean to respond to a Middle East crisis or to the initiation of NATO/Warsaw Pact hostilities. Homeporting could, of course, be implemented only with the approval of at least one of the NATO allies.

Enlarging Ground and Naval Forces: Key Longer-Run Issues

Many of the NATO programs mentioned above could probably be accomplished over the next five years. These programs would not, however, fully address the problems arising from NATO's shortfalls in ground and naval forces. As with the shorter-term programs, the assistance and support of the NATO allies can influence the way in which the United States might make longer-term improvements to its NATO-related forces, while meeting its other defense requirements.

Ground Forces. In the longer run, NATO could overcome its disadvantage in ground forces vis-a-vis the Warsaw Pact by adding the equivalent of eleven and one-half armored divisions to its forces. This force level increase would allow NATO to conduct a "steadfast" defense that would repulse a Warsaw Pact attack at the West German border. Based on shares of Gross National Product and other considerations, the United States would contribute about five of the eleven and one-half divisions, as well as the sealift to carry them to Europe. These five divisions would add about $38.9 billion to baseline costs; included would be funds to recruit and pay 115,000 additional Army personnel.

NATO could, of course, opt for a more modest increase. The additional two U.S. divisions discussed above as an alternative to the POMCUS program, if accompanied by corresponding allied increases, could provide NATO with the capability to conduct an elastic defense, which would cede some ground to Pact forces initially in order to gain time to mount a counteroffensive.

Naval Forces. The NATO alliance appears to have a shortage of available surface ships required to escort convoys across the Atlantic in the event of a war with the Warsaw Pact. Current U.S. shipbuilding programs could contribute to a reduction of that shortage, but only at the expense of other ship construction necessary for sustained naval operations outside the NATO area.

While the NATO allies are unlikely to produce large warships, they could meet the NATO requirement for smaller escorts by increasing their own shipbuilding programs. Were the allies to do so, the United States could augment its own shipbuilding program so as to enhance its naval capabilities for a NATO/Warsaw Pact conflict, as well as for operations in other regions, such as the Indian Ocean. Such a program might construct carriers in addition to large fleet escorts and specialized support and replenishment ships. The cost of this program would add $16.0 billion to the baseline in fiscal years 1982-1986.

Key Role of the NATO Allies

Since they are a part of a coordinated plan, the options discussed above depend critically upon the contributions of the NATO allies. Yet the ground and naval forces option discussed here would require fully two-thirds of the 3 percent a year in real growth that the allies are pledged to attain. Furthermore, a number of the allies have yet to meet their 3 percent commitment. If the allies were unable to sustain such a commitment, the United States would face the difficult choice between even larger NATO-related increases or a change in the relative emphasis of NATO and non-NATO requirements as the basis for defense planning.

GENERAL PURPOSE FORCES: OPERATIONS OUTSIDE THE NATO AREA

Modest Spending on Procurement Planned for the RDF

The centerpiece of DoD's program for non-NATO contingencies is the Rapid Deployment Joint Task Force (RDF), an aggregation of Marine and Army divisions, Air Force wings, carrier battle groups, and supporting mobility forces. Like programs for NATO-related forces, DoD's programs to support the RDF do not include increases in force levels. Instead, they are geared to increasing the speed with which forces can deploy to the Middle East, and include the construction of reception facilities in Oman, Somalia, Kenya, and Diego Garcia. The proposed programs are relatively modest, totaling $2.7 billion over the five-year period 1982-1986, and cannot be completed before the end of the decade.

Need for Increased Firepower and Support Depends on RDF's Opponent

Increments to the baseline could provide additional support forces for the RDF. Such increases would depend upon whom the

force is intended to oppose. It could be intended to support a friendly regime in the Middle East against external regional threats or internal dissension. With such "collective security" as an objective, the United States would provide only a part of the troops and materiel needed to defend an ally, but would require the ability to demonstrate quickly its commitment to that ally. Currently planned forces could probably accomplish this task. On the other hand, were the United States to act unilaterally, particularly against the Soviet Union, and to do so without drawing down units dedicated to European operations, as many as 60,000 to 70,000 additional support forces might be needed for the RDF. Adding these support forces to the current structure would call for an additional $7.3 billion in funding over the current baseline.

The RDF is also likely to require additional firepower for Middle Eastern contingencies. One way to augment ground force firepower, while minimizing the penalty that the transport of heavy equipment imposes on rapid mobility, would be for the Marine Corps to acquire lightweight armored vehicles, which could be moved by all active airlift transports. In contrast, the Army's main battle tank, the XM-1, can be carried only by the C-5, the world's largest transport aircraft. Research and development on lightweight armored vehicles could be accelerated to permit the introduction of these systems by 1984. In the meantime, the Marine Corps might acquire foreign-built vehicles. A lightweight armored vehicle program in fiscal years 1982-1986 would add $0.4 billion to baseline costs.

Additional Mobility Improvements Might Enhance Entry Against Enemy Opposition

Longer-term development and procurement programs focus on mobility improvements for the RDF. The baseline includes acquisition of maritime prepositioning ships, but not of the CX transport aircraft, a program not yet approved by the Congress but under consideration by the Department of Defense.

While implementation of both these programs would indeed enhance the speed with which the RDF could deploy to the Middle East--or elsewhere--neither would improve its ability to enter a region forcibly. One way to do so would be to deploy a Marine Amphibious Brigade full time in the Indian Ocean. The current amphibious lift force could support such a deployment only if most other Marine forward deployments were terminated, however. An

amphibious lift augmentation progam, which would procure more dock landing ships and helicopter carriers, could sustain these current deployments, while also allowing the United States to land Marines against enemy opposition with less than a week's warning. Augmenting amphibious lift would add $2.0 billion to baseline spending in 1982-1986, but could only be implemented over the better part of a decade.

ACTIVE-DUTY MILITARY MANPOWER

Equipment alone cannot guarantee defense capability; the military must also be able to attract and retain adequate numbers of personnel with appropriate backgrounds and skills. Manpower costs are key to the overall level of defense spending. Pay, allowances, and benefits for the nearly 4 million active-duty, reserve, and civilian personnel in the military services will consume about half of all defense outlays in fiscal year 1981.

Pay Increases Granted to Improve Recruiting and Retention

In recent years, the services have had difficulty recruiting and retaining personnel, particularly enlisted personnel, for duty with the active forces. Problems have centered on recruiting sufficient numbers of enlisted personnel who have high school diplomas and who score high on military entrance examinations, and on retaining experienced personnel in technical and specialized skills. Recruiting problems have been most severe in the Army; those of retention, in the Navy.

In response to these problems, the Congress in fiscal year 1981 enacted numerous increases in pay and benefits for active-duty personnel. At the same time, it required that the services raise enlisted recruit quality by accepting more high school graduates and fewer persons scoring low on entrance examinations.

Retention Will Improve, But Recuiting Problems May Persist

Most of the pay increases enacted in fiscal year 1981 were targeted at careerists, and CBO estimates that the number of careerists in each service will increase in fiscal years 1982-1986. Indeed, all services, except the Navy, will meet their career-manning objectives by 1982; the Navy will fall short of its objective in each of the next five years, but only by a small amount in 1986. Nevertheless, while overall numbers of career

personnel are likely to increase, some specialties may still suffer from shortages.

The outlook for recruitment is less favorable than that for career retention. In 1982, if the services meet their numerical goals for recruits, the percentage of male recruits holding high school diplomas will approach or meet levels experienced in recent years. The Army is not likely in 1982, however, to meet the target of 65 percent graduates set by the Congress for fiscal year 1981. Moreover, percentages of recruits who are graduates will decline in all the services in the years beyond 1982. This decline is due largely to test-score objectives set by the Congress and to expected declines in the youth population during the 1980s. Force level increases, such as those discussed above for ground forces, could increase demand for recruits and exacerbate current recruiting difficulties. Recruiting problems may, therefore, be the most pressing of the manpower issues facing the Congress.

Costs of Meeting Recruiting and Retention Goals Depend on Approach

These trends suggest the need for increases in compensation to solve recruiting problems and continue improvements in career retention. One approach would maintain pay raises that keep pace with increases in the private sector, and would provide increased cash bonuses targeted at recruits and careerists in short supply. The increase in bonuses would be sufficient to continue improvements in retention. The increase would also enable the services to meet their numerical recruiting goals, while still complying with the test-score objectives set by the Congress and maintaining the proportion of high school graduates at the average level of the last three years. This option would require $3.6 billion in additional budget authority over fiscal years 1982-1986. The cost could rise to $5.4 billion if, instead of using the average over the last three years, the Army sought to achieve the target of 65 percent high school graduates required by the Congress for fiscal year 1981.

On the other hand, added costs might be three or more times higher if across-the-board pay raises were used, rather than targeted bonuses. Similar results would apply to broad-based military education benefits. A package of education benefits sufficient in size to meet recruiting goals, but also available in equal amounts to all personnel, would be substantially more expensive than a program limited to skill areas in which recruits are in short supply.

72-199 O - 81 - 3

CONCLUSIONS

The Congress, in enacting the fiscal year 1981 defense budget, approved a series of programs that should lead to real growth in defense budget authority through 1985. Nevertheless, the Congress may wish to consider adding other programs not included in CBO's defense baseline. This report addresses a selection of these programs (see Summary Table 2).

A number of the programs considered in this report might be viewed as alternatives to one another. Nonetheless, all of them could be funded by a defense budget that grows at an average real rate of between 4 percent and 5 percent a year over the next five years, though growth rates in early years would be higher. This range falls within the target of 5 percent annual real growth that the Carter Administration proposed in its defense program for fiscal years 1982-1986.

The bulk of the improvements discussed in this report relate to general purpose forces. Choices relating to these initiatives are likely to center on the timetable for improving defense capabilities, and the preferred emphasis that might be placed on NATO- versus non-NATO-related programs.

SUMMARY TABLE 2. CHANGES TO THE BASELINE: COSTS OF EXAMPLES DISCUSSED IN THIS STUDY, FISCAL YEAR 1982 AND TOTAL FOR FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

Programs	1982	Total 1982-1986
Strategic Forces		
Near-term programs		
Increase B-52 alert rates	0.1	0.8
Longer-term programs		
Accelerate Trident II development	0.8	1.4
Other programs		
Enhance strategic C^3 a/	0.7	2.2
General Purpose Forces: NATO		
Near-term programs		
Add POMCUS-related funding	0.8	2.9
Homeport a carrier in the Mediterranean	0.3	0.7
Add funding for Air Force spare parts	0.3	1.3
Longer-term programs		
Add five fully supported armored divisions	7.5	38.9
Augment shipbuilding programs, including three aircraft carriers	4.2	16.0
General Purpose Forces: Rapid Deployment Force (RDF)		
Near-term programs		
Add 68,000 support troops	1.2	7.3
Procure lightweight armored vehicles	0.1	0.4
Longer-term programs		
Procure additional amphibious shipping	0.0	2.0
Manpower		
Targeted enlistment and reenlistment bonuses	0.5	5.4
Total Near-Term	2.8	13.4
Total Longer-Term	12.5	58.3
Total Other	1.2	7.6
Total All Programs	16.5	79.3

a/ As Chapter III indicates, command, control, and communications (C^3) have both near- and longer-term applications and, hence, are listed as "other programs."

CHAPTER I. INTRODUCTION

Recent Congressional debates over the size and disposition of the defense budget have differed markedly from those of the mid-1970s. Prompting this shift in approach were the sustained buildup and modernization of Soviet forces over the past decade, and the perception that the United States has suffered a series of reverses in various parts of the world.

In the immediate post-Vietnam years, Congressional deliberations often centered on efforts to reduce defense spending below the levels requested by the President's budget. In contrast, current Congressional concerns about the capability, readiness, and quality of U.S. forces have raised quite different questions: By how much should defense budgets increase, and how should those increases be allocated?

This new perspective on defense spending is reflected in recent actions by both the Administration and the Congress. President Carter's final Defense Department budget for fiscal year 1981 requested almost 7 percent real growth in new budget authority, substantially exceeding the 3 percent real growth target agreed upon by the United States and its NATO allies in May 1977. President Carter's fiscal year 1982 budget submission requests 4.2 percent real growth over 1981, 1/ and some advisers to President Reagan have called for even larger increases.

The Congress has also demonstrated its desire for higher levels of defense spending. The defense budget authority target set by the second concurrent resolution for fiscal year 1981, as approved in November 1980, implied more than 8 percent real growth over the fiscal year 1980 level.

KEY CONCERNS IN THE DEFENSE BUDGET DEBATE

Four concerns have been particularly prominent in the current defense budget debate.

1/ This figure uses the latest CBO inflation deflators. The deflators submitted by President Carter on January 15, 1981, yield a figure of 5.5 percent.

First, what can be done to improve U.S. strategic nuclear capabilities in the next few years? Reflecting concern over the U.S./Soviet strategic force balance, the Congress has approved a number of strategic force modernization programs requested by President Carter, and added at least one initiative of its own: development of a new bomber. Most of these programs, however, will not enhance capabilities until the late 1980s. For this reason, some have called for "quick fixes" to improve strategic capabilities in the near term. 2/

Second, are near-term improvements in conventional (or general purpose) forces, especially to enhance readiness, also needed? Some defense analysts have called for near-term additions to the stock of equipment held by conventional forces. 3/ Others contend that improving the readiness of existing equipment stocks is a more urgent priority.

Third, should conventional force improvements be directed primarily toward the European theater, or should non-NATO requirements be given higher priority? Some observers believe that improvements directed primarily toward the European theater may have hampered U.S. ability to conduct military operations in Third World regions. These observers contend that the interests of the United States, and indeed of Western Europe, may be more vulnerable outside the NATO area than within it, particularly in the next few years. If this view is accepted, it could change the relative priorities of existing programs.

Fourth, will the United States succeed in maintaining a high-quality all-volunteer force? The Congress enacted a package of compensation increases for fiscal year 1981 designed to improve recruitment and retention of personnel and to increase the quality

---

2/ See, for example, William R. Van Cleave, "Quick Fixes to U.S. Strategic Nuclear Forces," in W. Scott Thompson, ed., National Security in the 1980s (San Francisco: Institute for Contemporary Studies, 1980).

3/ The Institute of American Relations, Independence Through Military Strength: A Program for Forces to Preserve and Extend American Freedom, 1980-85 (Washington, D.C., February 1980). This study was produced by approximately 30 Senate and House staff members working primarily in areas involving national security and foreign policy.

of military manpower. Some are concerned that these measures may not be sufficient to achieve those goals and that additional compensation increases may be needed, particularly if the force structure were expanded beyond current levels.

THE COSTS OF RESOLVING THESE KEY CONCERNS

This report reviews a selected group of issues in order to illustrate how different approaches to resolving these four concerns would affect defense budgets over the five-year period fiscal years 1982-1986. These issues are drawn from recent CBO studies and analyses prepared at the request of the Congress. While the issues examined account for a significant portion of defense spending, they by no means exhaust all the programs that the Congress will need to address.

The paper discusses the programs chosen for review in light of their contribution to near-term (fiscal years 1982-1986) or, alternatively, longer-term enhancement of the U.S. defense posture. This distinction underlies many of the questions discussed above. Where appropriate, the paper also discusses these programs as they relate primarily to NATO or to extra-NATO concerns, another key consideration. Finally, the paper estimates how the near-term or longer-term enhancement packages--or both--would affect CBO's "baseline" projection of defense spending for fiscal years 1982-1986.

Because of its importance to the costing methodology used in this paper, the CBO baseline is described in detail in Chapter II. Chapters III through VI examine the budgetary implications of an illustrative group of defense programs and alternatives to them, highlighting both their near-term and longer-term implications:

- Chapter III outlines program issues related to strategic nuclear forces;
- Chapters IV and V address general purpose force issues related to NATO and non-NATO missions, respectively; and
- Chapter VI discusses manpower program issues.

Finally, Chapter VII draws together the conclusions of the preceding chapters, assessing the impact on the baseline of emphasis on near-term, longer-term, or both near- and longer-term programs. The chapter also discusses how baseline spending,

augmented by the alternatives considered in this paper, compares to spending levels set by the Second Concurrent Resolution on the Budget for Fiscal Year 1981, and by the five-year program submitted to the Congress by the Department of Defense in support of its fiscal year 1982 budget request.

CHAPTER II. MEASURING TRENDS IN U.S. DEFENSE BUDGETS AND FORCES

Future decisions about U.S. defense budgets may be influenced by trends in defense budgets and forces over the last several decades. Thus, this chapter begins with a brief history of those developments. (Additional historical detail is provided in Appendix A.)

Future decisions will certainly build upon programs already funded by the Congress. The CBO baseline, which estimates the costs of these programs over the next five years, is the subject of the last half of the chapter.

TRENDS IN DEFENSE BUDGETS AND FORCES, 1955-1980

Budgets

Measured in constant fiscal year 1982 dollars, new budget authority for defense followed a generally rising trend in the 1950s and 1960s, peaking during the Vietnam War period (see Figure 1). New budget authority then declined sharply in real terms until 1975, after which it began to increase modestly. Budget authority continued to rise through the remainder of the decade, and today approximates the level of the early 1960s.

Throughout the period 1955-1970, defense spending as a percentage of the Gross National Product (GNP) fluctuated within a relatively narrow band, typically ranging from 8 to 10 percent of GNP. With the cutback after the Vietnam War, however, defense spending fell quickly to about 5 percent of GNP (see Figure 2). With the increases of the last several years, defense spending as a percentage of GNP has begun to rise.

Forces

The components of U.S. strategic nuclear forces have followed divergent trends. As ballistic missile forces increased in the 1960s, the number of active strategic bomber and air defense aircraft was reduced (see Table 1).

Figure 1.
Budget Authority for National Defense (Function 050), 1955-1981

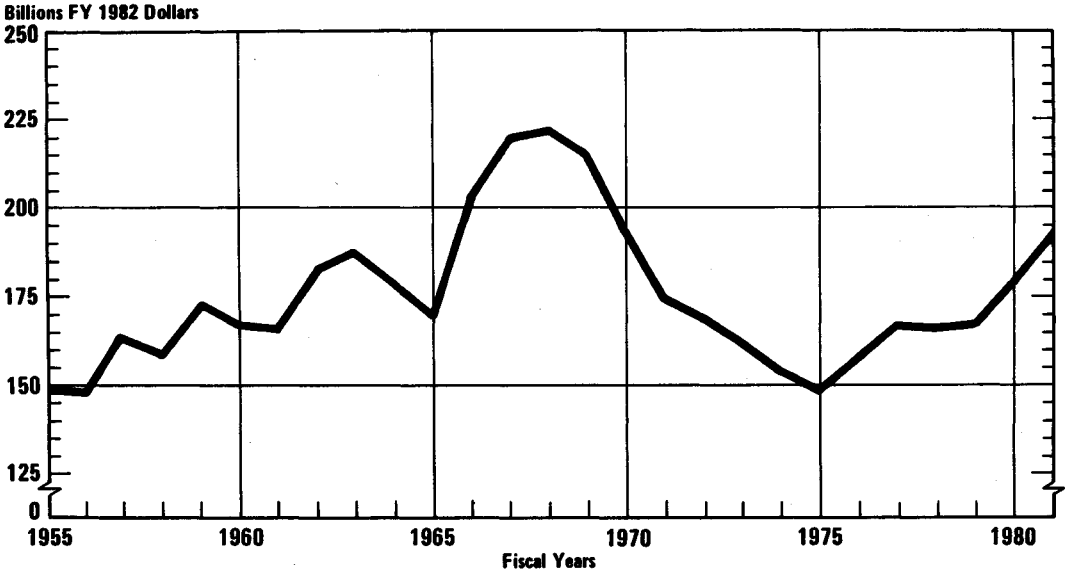


Figure 2.
Outlays for National Defense (Function 050) as a Percent of GNP, 1955-1981

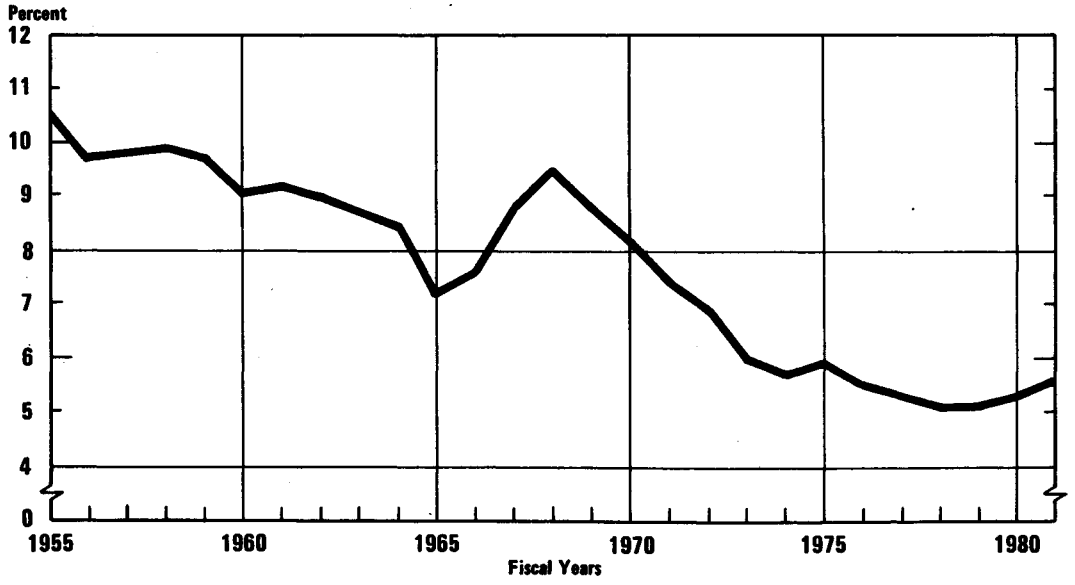


TABLE 1. U.S. DEFENSE FORCES (END OF FISCAL YEAR)

Forces	1964	1970	1975	1980
Strategic Forces (in numbers of units)				
Intercontinental ballistic missiles	242	1,057	1,054	1,054
Submarine-launched ballistic missiles	336	656	656	656
Strategic bomber aircraft (PAA) a/	1,160	469	396	376
Air defense aircraft (PAA) a/	1,429	583	376	273
General Purpose Forces (in numbers of units)				
Active Army maneuver battalions b/	159	187	151	168
Active fleet ships (includes MSC) c/	918	774	514	478
Tactical fighter aircraft (PAA) a/ d/	2,656	2,820	1,958	2,606
Total Manpower, Military and Civilian (in thousands)	3,824	4,330	3,205	3,036

a/ Primary aircraft authorization, a measure of aircraft available to the operational commander.

b/ Includes airborne, airmobile, tank, infantry, ranger, and mechanized infantry battalions.

c/ Military Sealift Command.

d/ All services.

In general purpose forces, the United States was expanding its capabilities even before the Vietnam War, adding divisions, ships, and planes. After Vietnam, however, active divisions were cut; and tactical fighter aircraft levels declined by 31 percent between 1970 and 1975. The number of ships in the active fleet

shrank by a third, reflecting both the obsolescence of large numbers of ships built during the later years of World War II and a deliberate effort to reduce operations and maintenance costs by retiring ships earlier than originally planned (see Table 1). 1/

Consistent with the recent turnaround in new defense budget authority, the United States has embarked on a major modernization of its strategic forces, including construction of the Trident-class submarine, procurement of the Trident I missile and air-launched cruise missiles (ALCM), and modification of the B-52 bomber force to carry ALCMs. The United States is also developing its first mobile intercontinental ballistic missile (ICBM) system, the MX/Multiple Protective Structure system, and a more accurate Trident missile with a larger payload, the Trident II.

Similarly, major improvements to the general purpose forces have begun. The number of active Army maneuver battalions has increased by more than 10 percent since 1975. The number of ships in the active fleet only began to increase in the last three years, but the average displacement and ship-for-ship capabilities of new construction have increased steadily since 1975. A major tactical aircraft replacement effort is also well under way. F-14s, F-15s, and F-16s are replacing older fighter aircraft; the A-10 has been introduced as an attack aircraft; the F/A-18 program, to provide attack and lightweight fighter aircraft for the Navy and the Marines, has entered production; and the Congress has begun to fund procurement of the AV-8B vertical/short take-off and landing (V/STOL) aircraft for the Marine Corps.

Manpower levels in the Defense Department have followed the fortunes of conventional forces, rising during the 1960s and peaking toward the end of that decade. When conventional forces were cut back in the early 1970s, however, manpower levels fell even more sharply. Although a number of factors underlie this development, notably creation of a smaller, all-volunteer force, it mirrors the broad trend in the civilian sector, where

---

1/ The naval shipbuilding programs of World War II, and the subsequent ability of the United States to maintain nearly a thousand ships in the active fleet, reflected the extraordinary expenditures of that period. Budget authority for defense programs rose to nearly $258 billion (in fiscal year 1982 dollars) by the end of World War II, and outlays reached almost 40 percent of GNP.

many activities are being carried out with less manpower than before. It remains to be seen whether current and future modernization of conventional forces will require an increase in manpower levels, however.

THE CBO BASELINE: A PROJECTION OF FUTURE DEFENSE PROGRAMS AND BUDGETS

This report employs the CBO defense baseline as a measure of future defense budgets and as a benchmark for evaluating the effects on costs of alternative defense programs. The baseline is a projection, but not a prediction, of future defense budgets and forces.

The baseline incorporates Congressional action on the President's fiscal year 1981 defense budget, as reflected in the defense authorization and appropriation acts. Based on the implications of the 1981 defense budget, the baseline estimates investment and force structure costs for fiscal years 1982-1986. 2/

It is possible to construct a baseline estimate for 1982-1986 because the Department of Defense (DoD) must inform the Congress of its major investment plans for the next five years as part of each year's budget submission. Decisions made in the authorization and appropriations process for the current fiscal year can then be used to modify those investment plans to reflect likely Congressional intent in future years. Similarly, operating costs for future forces--which depend in part on delivery of equipment now being procured--can also be inferred from DoD plans and Congressional actions on the current budget. Thus, the CBO baseline is a program-oriented projection of future defense budget authority. (Appendix B provides additional detail on the baseline methodology.)

The CBO baseline assumes relatively constant force levels for fiscal years 1982-1986, with modest increases in the number of ballistic missile submarines, Navy warships, and Air Force tactical aircraft (see Table 2). It assumes continued modernization of the strategic forces and tactical aircraft, as well as procurement of the Army's new generation of equipment. Navy shipbuilding in the baseline averages 17 new vessels per year.

2/ Investment costs include research and development expenditures and procurement of new equipment.

TABLE 2. MAJOR FORCES AND PROCUREMENT PROGRAMS ASSUMED IN THE CBO BASELINE, FISCAL YEARS 1982-1986

Forces and Programs	1982	1983	1984	1985	1986	Total at End of 1986 a/
Forces (number operational per year)						
Strategic Forces						
ICBM launchers	1,054	1,054	1,054	1,054	1,054	1,054
Strategic bombers	376	376	376	376	388	388
Ballistic missile submarines	34	35	37	38	40	40
General Purpose Forces						
Land forces						
Active Army divisions	16	16	16	16	16	16
Active Marine divisions	3	3	3	3	3	3
Army National Guard divisions	8	8	8	8	8	8
Reserve Marine divisions	1	1	1	1	1	1
Naval forces						
Warships	294	308	318	321	328	328
Tactical air forces						
Navy aircraft (PAA) b/	696	696	696	696	744	744
Aircraft carriers	13	13	13	13	14	14
Air Force aircraft (PAA) b/	2,388	2,484	2,502	2,502	2,502	2,502
Mobility forces						
Aircraft	802	802	802	802	802	802
Ships	16	16	16	16	16	16
Procurement (units ordered per year)						
Strategic Forces						
Trident submarines	1	1	1	2	0	5
Trident I missiles	72	72	72	54	0	270
Trident II missiles	R&D c/	R&D	R&D	R&D	50	50
Manned bomber	R&D	12	33	48	48	141
MX missile	R&D	9	49	72	72	202
KC-135s re-engined	9	63	72	72	72	288
General Purpose Forces						
XM-1 tanks	873	1,080	1,080	1,080	1,080	5,193
IFV/CFV (fighting vehicles)	600	617	1,080	1,080	1,080	4,457
AH-64 helicopters	14	78	96	96	96	380
SSN-688 submarines	2	2	2	2	2	10
CG-47 cruisers	2	4	3	4	4	17
FFG-7 frigates	4	4	4	4	2	18
F-18 aircraft	108	147	174	191	191	811
AV-8B aircraft	12	24	54	54	54	198
F-16 aircraft	180	180	180	180	63	783
A-10 aircraft	46	46	46	0	0	138
KC-10 aircraft	6	8	0	0	0	14
C-130 aircraft	8	0	0	0	0	8

a/ For procurement, the sum of units ordered between 1982 and 1986.

b/ Primary aircraft authorization, a measure of aircraft available to the operational commander.

c/ Research and development.

Under these assumptions, real growth in defense budget authority will range from 2.2 percent to 3.2 percent annually between 1982 and 1984 (see Table 3). The baseline projects a real decline in defense budget authority in 1986 because current publicly available DoD documents do not indicate replacements for those programs that will be completed by the mid-1980s.

TABLE 3. BASELINE DEFENSE BUDGET AUTHORITY, FISCAL YEARS 1981-1986 (In billions of dollars, annual percentage real increases in parentheses)

	1981	1982	1983	1984	1985	1986
Baseline Budget Authority						
Current dollars	171.0	196.1	222.5	249.3	273.0	287.8
Constant fiscal year 1982 dollars	190.0	196.1	202.1	206.5	206.8	199.4
Percentage Real Growth Over Preceding Year	--	(3.2)	(3.1)	(2.2)	(0.1)	(-3.6)

Investment in strategic forces accounts for most of the real growth in the baseline. Real funding for conventional forces is roughly constant, with increases for Army investment, Navy aircraft, and Air Force spare parts offset by declines in procurement of Air Force tactical aircraft when currently planned programs come to an end.

CBO's baseline grows substantially more slowly in real terms than the 5 percent rate proposed by President Carter. Thus, against this topline, and certainly against any higher topline, uncommitted budget authority would be available for additional improvements to U.S. defense capabilities. In 1985, for example, this margin represents 12 percent of the baseline. The following chapters illustrate some of the ways in which such a margin might be employed, estimating the costs of selected approaches to improving U.S. defense forces.

CHAPTER III. STRATEGIC FORCES

Budgets for strategic nuclear forces will again be an important issue in fiscal year 1982. These forces include both offensive and defensive systems, as well as command, control, and communications capabilities to coordinate them. Offensive systems consist of a "triad" of forces: land-based intercontinental ballistic missiles; submarine-launched ballistic missiles; and manned bombers, along with tanker aircraft to support them. Defensive forces include early warning radars and interceptor aircraft to counter enemy bomber attacks. The Congress provided $14 billion in fiscal year 1981 to operate and modernize these forces.

Debates over strategic budgets are often dominated by assessments of the balance of forces between the United States and the Soviet Union. Perceptions differ widely on the state of the strategic balance, depending on assumptions about which forces should be included in determining the balance, the numbers and capabilities of systems, the survivability of launch platforms, and the vulnerability of command and control systems. Disagreements on some of these points were clear during the debate over the proposed SALT II treaty, which the Senate apparently will not ratify.

Despite lack of consensus on the state of the overall balance, there has been widespread concern about trends in U.S. capabilities. Because of improved Soviet missile accuracy, U.S. land-based missiles may now be vulnerable to a Soviet first-strike attack. 1/ There is also apprehension among some analysts that Soviet missiles could destroy U.S. strategic bombers before they could take off. 2/ For both these reasons, the United States

---

1/ "Remarks Prepared for Delivery by Hon. Harold Brown, Secretary of Defense, at the Convocation Ceremonies for the 97th Naval War College Class, Naval War College, Newport, R.I., Wednesday, August 20, 1980," Congressional Record (November 12, 1980), pp. E4917-18.

2/ The Institute of American Relations, Independence Through Military Strength: A Program for Forces to Preserve and

72-199 O - 81 - 4

may no longer have a triad of survivable systems, each providing a hedge against failure of the others.

These concerns have been highlighted by the United States' current strategic doctrine. That doctrine now stresses a wider range of retaliatory options; these include retaliation against Soviet military and command targets, possibly over a prolonged period, along with continued emphasis on immediate and massive retaliation against population centers and economic targets. Some options in the current doctrine, reportedly codified last year in Presidential Directive 59, place a premium on survivable forces that can attack hardened military targets and on a survivable system for command and control.

In response to these concerns, the Congress has begun funding programs that, if fully implemented, would substantially increase U.S. strategic capabilities in the mid-1980s and beyond. These include:

- Continued procurement of new ballistic missile submarines and submarine-launched ballistic missiles;
- Possible procurement of a new manned bomber, plus outfitting of a portion of the existing B-52 bomber fleet with cruise missiles; and
- Development of a new, mobile land-based missile--the MX--to be deployed in a special basing system.

But key issues remain. What improvements, if any, could be made in the U.S. strategic forces over the next few years? By how much might costs of U.S. systems increase because of Soviet responses in a no-SALT world? What would happen if cost constraints or other considerations forced changes in the programs that the Congress has already begun, particularly in the highly controversial progam for basing of the MX missile?

This chapter begins by noting the scope and costs of programs already begun by the Congress. The chapter next addresses some of the remaining key issues, beginning with possible ways to improve near-term strategic capabilities, including:

Extend American Freedom: 1980-85 (Washington, D.C., February 1980), p. 3.

- Placing more B-52 aircraft on alert;
- Modifying FB-111 aircraft; and
- Placing Minuteman III land-based missiles in a new basing system.

The chapter then discusses options that would improve capabilities in the longer run. These include:

- MX missile system;
- Trident II submarine-based missiles; and
- Tanker programs.

The chapter concludes by discussing improvements in command, control, and communications systems that would affect both near- and longer-term capabilities.

MODERNIZING STRATEGIC FORCES: CURRENT PLANS

The United States has begun to modernize or alter all three elements of its strategic offensive nuclear triad. For the sea-based segment of the triad, the Congress has funded a new class of submarines, the Trident, that will replace the aging Polaris class and, eventually, all Poseidon submarines as well. The new Trident submarines, as well as 12 Poseidons, will carry the new Trident I missile, whose range and warhead yields exceed those of the current Poseidon missile. The Congress has also continued to fund development of the Trident II missile, which is intended to have greater accuracy and a larger payload at equivalent ranges than the Trident I.

The United States continues to operate its 20-year-old B-52 bomber fleet. The fleet will, however, be provided with the capability to carry newly developed, air-launched cruise missiles, which may increase the effectiveness of air-launched weapons.

In addition, the Congress has provided research and development funds for the introduction of a new manned strategic bomber no later than 1987. One candidate is a derivative of the B-1, the manned bomber program cancelled in 1977. Since much of the technical engineering and research and development has already been completed, a B-1 derivative could be obtained more quickly than a

new-design aircraft. But the derivative might not incorporate the newest technology, including any "stealth" modifications.

Finally, in response to growing evidence of the vulnerability of Minuteman land-based missiles, the Congress has funded development of the MX missile. Larger and more accurate than the Minuteman, the MX is intended to be deployed in a special basing system to enhance its survivability. The Congress has also provided funds for continuing development of new ballistic missile defense technologies that could be used in connection with the MX or other missiles.

All these programs are included in the strategic portion of the CBO baseline (discussed in Chapter II). These programs would substantially increase the costs of the strategic forces in the baseline over the next several years (see Table 4). Costs will grow from $15.6 billion in fiscal year 1981 to $29.1 billion in 1984. 3/ Also, the rate of growth in strategic costs will average about 23 percent a year over the next three years, compared to an annual average growth rate of about 3 percent in the baseline defense budget as a whole.

TABLE 4. BASELINE COSTS OF STRATEGIC FORCES AND REAL GROWTH IN STRATEGIC AND DEFENSE BUDGETS, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars, annual percentage real increase in parentheses)

	1981	1982	1983	1984	1985	1986
Strategic Forces Costs	15.6	18.1	24.9	29.1	30.9	28.3
Real Growth						
Strategic forces	—	(16.0)	(37.6)	(16.9)	(6.2)	(-8.4)
Defense budget	—	(3.2)	(3.1)	(2.2)	(0.1)	(-3.6)

3/ Unless otherwise noted, all costs in this report are in constant fiscal year 1982 budget dollars.

NEAR-TERM IMPROVEMENTS

The Congress has begun many new strategic programs. A few, such as introduction of air-launched cruise missiles and submarine-based Trident I missiles, will add to U.S. strategic capabilities over the next five years. Yet some analysts believe that the status of the U.S.-Soviet strategic balance demands more substantial near-term improvements. These analysts argue that the United States may be, or will soon be, behind the Soviets, at least in terms of some measures of strategic capability. For example, after a Soviet first strike and a U.S. counterstrike, the United States would probably have less remaining "equivalent megatonnage" than the Soviets. 4/ (Equivalent megatonnage measures both the number and size of warheads and adjusts for their capability to destroy targets.) The relative shortfall in equivalent megatonnage would be most severe if the Soviets attacked without warning rather than during a crisis, when U.S. forces would be on alert and thus have a better chance of surviving. This shortfall would be largest in the early 1980s and would gradually disappear as new U.S. systems become operational. Some believe such a shortfall could increase the chances of a Soviet attack during this period of vulnerability, or at least could limit U.S. political options.

On the other hand, other important measures of strategic capability--such as numbers of warheads--do not suggest that the United States is behind the Soviets. Perhaps more important, any shortfall in equivalent megatonnage may be of little significance when considered in the context of the total nuclear and conventional capabilities of the two superpowers.

While the arguments about the importance of near-term strategic improvements remain unresolved, numerous improvements have been suggested and could be debated by the Congress. This section examines the costs and likely schedules of three such options and notes several others.

More B-52 Aircraft on Alert

The quickest way to enhance U.S. strategic posture is to place a greater portion of existing U.S. bombers on day-to-day

---

4/ U.S. Department of Defense, Annual Report, Fiscal Year 1981, p. 125.

"strategic alert." Bombers on alert are fueled, loaded with weapons, and have crews standing by at all times. At present, the Strategic Air Command keeps about 30 percent of its B-52 bombers on strategic alert.

Increasing the numbers on alert would improve U.S. capability against a no-warning strategic nuclear attack by the Soviet Union, since the readiness of alert bombers to take off immediately enhances their chances of surviving a surprise attack. Increasing the alert rate from 30 to 40 percent would, for example, put 480 more weapons on day-to-day alert. 5/ These higher alert rates could be achieved almost immediately, and at little extra cost, by increasing the workload of bomber crews and maintenance personnel.

To avoid risking adverse effects on manpower retention and aircraft maintenance, however, the alert rates would have to be increased more gradually and costs would go up. More funding would be needed to pay for recruiting and training additional air crews and maintenance personnel, procuring larger numbers of spare parts, and increasing total flying hours to maintain crew readiness. If, for example, 40 percent of the newer B-52s (the G and H models) and accompanying tankers were put on alert, costs would rise by a total of $820 million between fiscal years 1982-1986 (see Table 5).

While increased alert rates would improve capabilities against a surprise attack, the change obviously would not improve U.S. capabilities if tensions had already put all forces on alert. Yet such an alert might well precede any nuclear war. (Indeed, planning for conventional forces assumes some warning.) Moreover, increasing alert rates would not add to the overall number of bombers, nor would it provide added capability beyond the life of the B-52 aircraft.

FB-111 Modification Program

Unlike the B-52 program, an FB-111 modification program would add to overall bomber force capacity once it was completed. It might also provide added capability beyond the life of the B-52s,

---

5/ This calculation assumes that all extra B-52s on alert would carry maximum weapons loads.

TABLE 5. INCREASED COSTS ABOVE THE BASELINE OF HIGHER B-52 ALERT RATES, FISCAL YEARS 1982-1986 (In millions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total
Increase B-52 Alert Rates from 30 to 40 Percent						
B-52G/H cost increase	30	120	170	120	60	500
KC-135 tanker support	30	50	80	80	80	320
Total	60	170	250	200	140	820

SOURCES: B-52 alert rates based on data provided to CBO by the U.S. Air Force, October 1979. CBO provided estimates of support costs associated with higher levels of activity in combat units. (The Air Force states that additional nonrecurrent funds would be required for military construction and military family housing. Such estimates are not included here. The table includes only recurrent costs.)

since the FB-111s are newer planes. The plan involves modification both of the 66 FB-111s already operated as strategic bombers and of 89 F-111s now designated as long-range fighters for conventional conflicts. These planes would receive additional fuselage sections and new engines of the type designed for the B-1 bomber, as well as other improvements. This combination of modifications would enable a doubling of the FB-111's weapons capacity from 6 to 12 bombs per aircraft. This increased capacity, plus the addition of 89 more aircraft to the strategic force, would increase the number of weapons, given current day-to-day alert rates, from approximately 110 on today's FB-111 force to approximately 500 on the enlarged force.

Several major reservations apply to the FB-111 proposal, however. The first is its cost—which could equal more than $6 billion in fiscal years 1982-1986. 6/ (The baseline costs of

6/ This cost does not anticipate modification of FB-111s to carry cruise missiles. Yet the Congress requires this capability in a new manned bomber. Thus, costs might have to be increased if modified FB-111s are to meet the Congressional requirement.

strategic forces already include funds for a new manned bomber. Thus, added costs of the FB-111 modification program, which would be an alternative to developing a new manned bomber, would not add to the costs of the baseline.) Furthermore, reassigning the F-111s to the strategic bomber fleet would reduce the number of conventional aircraft capable of long-range missions at a time when such aircraft appear to be a critical requirement for operations over vast regions in the Middle East and Indian Ocean region. Indeed, the Tactical Air Command (TAC)--which operates the conventional fighters--might be reluctant to give up its F-111s, which recently underwent avionics modernization at a cost of more than $130 million. If additional planes were acquired for conventional TAC missions, costs would increase substantially. For example, replacing the 89 F-111s with the same number of F-15 aircraft would add $2.5 billion to costs for the replacement aircraft alone.

Moreover, it might be difficult to modify a significant number of FB-111s within the next five years. Even proponents have suggested that, if begun in fiscal year 1981, the first squadron of modified aircraft would not be available until fiscal year 1984, with program completion in fiscal year 1986. 7/ Particularly if there were any slippage in the schedule, this option might not substantially increase capability over the next five years.

Minuteman Missiles in MPS Basing

There is great concern about the potential vulnerability of U.S. land-based missiles to a Soviet first-strike attack. One proposed near-term improvement would reduce this vulnerability by putting the latest class of land-based missiles, the Minuteman III, in a multiple protective structure (MPS) basing system. 8/

7/ Testimony of General Richard Ellis in Department of Defense Authorization for Appropriations for Fiscal Year 1981, Hearings before the Senate Committee on Armed Services, 96:2 (February, March, and April 1980), Part 2, pp. 553, 615. The testimony implied that the first squadron could be on alert in fiscal year 1984 if funds were made available at the beginning of fiscal year 1981.

8/ Independence Through Military Strength, pp. 11-12; Francis P. Hoeber, William Schneider, Jr., Norman Polmar, and Ray

Such a basing system, which is analogous to the one planned for the new MX system, would covertly shuttle Minuteman III missiles among a large number of vertical shelters. (These vertical shelters are concrete-lined holes in the ground that protect the missiles from nuclear blasts.) Because there would be many more shelters than missiles, the Soviets would not know which, at any given time, actually contained missiles. Vulnerability would therefore be reduced, since the Soviets might not have enough warheads to attack all the shelters to ensure that all the missiles were destroyed.

Putting Minuteman III missiles in an MPS basing system would be expensive. Costs for investment alone could total $42 billion over the next ten years, if planners wanted about 1,000 warheads to survive a Soviet first strike. 9/ Costs would be lower if planners settled for fewer surviving warheads. These costs are updated versions of earlier CBO estimates; recent Air Force estimates indicate the cost may be much higher. 10/ Whatever the exact figure, the estimates suggest that the cost of sheltering Minuteman III in an MPS basing system could approach, or even exceed, the $47 billion in investment costs (see Table 6 later

---

Bessette, Arms, Men, and Military Budgets: Issues for Fiscal Year 1981 (New York: National Strategy Information Center, 1980), p. 51; questions by Senator Tower in Department of Defense Authorization for Appropriations for Fiscal Year 1981, Hearings, Part 2, pp. 602-3.

9/ This discussion draws upon CBO findings outlined in Congressional Budget Office, The MX Missile and Multiple Protective Structure Basing: Long-Term Budgetary Implications (June 1979). While clearly additions to the baseline, costs of this system are not included in Table 5 because time-phased costs over the next five years are not available. Costs cited above assume that the Minuteman III missiles would be based in the northern United States and use some existing base facilities, even though weather and other factors make this a less attractive deployment area than the Southwest, where the Air Force plans to base the MX missile system.

10/ Costs in the original CBO paper, which is now nearly two years old, were based on an Air Force cost model. The estimating relationships in this model have apparently changed. The numbers cited above were updated by applying

in this chapter) that would be needed to ensure that 1,000 warheads could survive an attack on a proposed MX missile system.

One reason for the high costs is the large number of vertical shelters that would have to be built. Given the deployment of 550 Minuteman III missiles, CBO estimates that about 10,000 shelters would be required to ensure 1,000 surviving warheads. 11/ The large number of shelters is needed because Minuteman III carries only three warheads, whereas MX would carry 10.

Even with these substantial expenditures, it is not clear that Minuteman could be deployed in an MPS basing system within the next five years. Recent Air Force estimates suggest that initial operations could not begin until the late 1980s. Although independent estimates have suggested much earlier dates, these might require a crash program coupled with Congressional waivers of environmental and procurement regulations. Thus, it appears highly uncertain that Minuteman in MPS basing would add to near-term strategic capability.

Other Options

While the near-term improvements discussed above are among the key ones, they are not the only alternatives available. Other options, which are beyond the scope of this paper, include expanding the program to retrofit more longer-range Trident I missiles into Poseidon submarines, converting Polaris submarines to carry cruise missiles, and modifying SSN-688 attack submarines to carry cruise missiles. The Senate Armed Services Committee

---

the ratio of Minuteman to MX costs from the original CBO paper to estimates of MX costs based on the updated Air Force model. Even after this adjustment, recent Air Force estimates of Minuteman MPS basing costs have been higher. One Air Force estimate, when adjusted to achieve comparability with CBO system cost estimates cited above, might total as much as $55 billion for investment alone.

11/ See Congressional Budget Office, The MX Missile and Multiple Protective Structure Basing, for a discussion of costs under other circumstances, such as differing numbers of missiles and warhead levels.

has requested that DoD study these and other options and report to both the House and Senate Armed Services Committees by March 1, 1981. 12/

Recapitulation: Few Truly Near-Term Improvements Available

Of the options analyzed in this section, only one--increasing B-52 alert rates--would be likely to enhance strategic capabilities in the next few years. Indeed, some options that have been proposed to provide near-term improvements would not add to capabilities in the next few years without extraordinary crash programs.

LONGER-TERM IMPROVEMENTS

Although there is disagreement about the urgency and type of near-term strategic improvements, there is less disagreement about the need for longer-term modernization. Here the questions center on the long-run costs of the MX missile system and the effects of any change in its basing mode. Questions also arise about the urgency of developing the Trident II missile and about U.S. tanker programs.

MX Missile System

The Carter Administration accorded highest priority to deployment of the MX missile system, which is currently in full-scale development. The MX system would be substantially different from existing U.S. land-based missile systems, the newest of which is the Minuteman III. The MX missile itself could carry at least ten large warheads, while the Minuteman III could carry only three of the same size. In addition, the MX is expected to employ a far more accurate guidance system, the advanced inertial reference sphere (AIRS), than Minuteman III currently has. Finally, and most importantly, current plans call for basing the MX in a

---

12/ See Authorizing Appropriations for Fiscal Year 1981 for Military Procurement, Research and Development, Active Duty, Selected Reserve, and Civilian Personnel Strengths, Civil Defense, and for Other Purposes, S. Rept. 826, 96:2 (June 1980), pp. 103-104.

multiple protective structure (MPS) system. The Air Force plans for 200 MX missiles to be shuttled randomly and covertly among 4,600 horizontal shelters. (These would be concrete structures that would protect the missiles, which would be stored horizontally, from the effects of nuclear detonations.) This system of multiple protective structures would help ensure that some missiles would survive a Soviet first strike, since the Soviets would have to destroy a very large number of shelters in order to destroy all the missiles. The MPS system also is designed to comply with the verification requirements of the SALT II treaty, which the United States has signed but not ratified.

The Air Force plans to have some MX missiles deployed in shelters by fiscal year 1986, with full operating capability projected for calendar year 1989. Yet environmental problems could well cause delays, particularly in the 1986 date for initial operating capability. Moreover, long-run costs could increase substantially. These concerns could force a change in the MPS basing mode.

Environmental Problems. Under current plans, the MX system of shelters and missiles would probably be deployed on public lands in Utah and Nevada. About 8,500 square miles would be involved, though only 25 would be withdrawn from public use. 13/ Members of the Congress and state and local officials have expressed concern about the environmental and socioeconomic effects of the MX system. The system would bring many persons to a sparsely populated area. As many as 25,000 might come during the construction period; 26,000 to 34,000 persons would be permanent residents at operating bases. Such an influx could seriously disrupt local life. The system would also consume substantial quantities of scarce water during construction and might interfere with later use of the land for other purposes. Some of these problems might be avoided or mitigated by federal financial assistance and careful planning. Nonetheless, these issues threaten to delay the MX system and could force a change in its basing mode as well.

Cost Concerns. The MX system will be expensive. A CBO base-case version could cost, over the long run, a total of $47

13/ Department of the Air Force, MX Deployment Area Selection and Land Withdrawal Acquisition Environmental Impact Statement: Summary (1980), pp. 3-4.

billion for investment alone (see Table 6). 14/ Investment here includes development, procurement, and deployment costs for an MX system with horizontal shelters. Total costs, including operating dollars, would be even higher (see Table 6). The base case, which is used as a reference in the remaining discussion, has 275 missiles and 5,828 horizontal shelters. It was developed to ensure that 1,000 U.S. warheads would survive a Soviet first strike. The Soviet threat in this first strike was estimated using publicly available data. (The Air Force's proposed system differs.) 15/

Costs could, of course, be substantially higher than the $47 billion for the CBO base case, because of delays in the MX schedule or because of unforeseen increases in development, procurement, or construction costs. Costs could also rise if federal payments were required to ameliorate socioeconomic problems in the development area; no such payments are contained in the base-case costs.

Costs could also increase if the Soviet Union increased its own strategic force levels in response to deployment of the MX system. The base case assumes a Soviet threat similar to that which might face MX in the late 1980s. It assumes no special efforts on the part of the Soviet Union to expand its forces. But, particularly in the absence of any strategic arms limitations (such as those in the proposed SALT II treaty), the Soviet threat could grow. The Soviets could, for example, deploy intercontinental ballistic missiles with multiple warheads (known as multiple independently targetable reentry vehicles, or MIRVs) in all their approximately 1,400 silos by 1987; MX is not expected to be completed until calendar year 1989. This could be accomplished

---

14/ The discussion that follows is drawn from Congressional Budget Office, SALT II and the Costs of Modernizing U.S. Strategic Forces (September 1979), pp. 18-29; and from Congressional Budget Office, The MX Missile and Multiple Protective Structure Basing, pp. 22-27, 47-50, 131-133.

15/ The Air Force MX system, using goals for surviving warheads and a Soviet threat that are classified, has 200 missiles and 4,600 shelters. The Air Force system would cost about $41 billion for investment alone. (This estimate uses CBO inflators to adjust the Air Force cost estimate, which was stated in 1980 dollars.)

TABLE 6. IMPACT OF CHANGES IN THE NUMBER OF SOVIET WARHEADS ON THE LONG-RUN COSTS OF A U.S. MULTIPLE PROTECTIVE STRUCTURE (MPS) BASING SYSTEM WITH MX MISSILES (In billions of fiscal year 1982 dollars)

Programs to Achieve 1,000 Surviving Warheads	Soviet Threat	U.S. Response		U.S. System Cost, Shelters and Missiles a/	
	Number of Soviet Warheads	Number of Horizontal Shelters	Number of U.S. MX Missiles	Investment	Total
Base Case (820 MIRVed ICBMs) b/	5,928	5,828	275	47	55
Higher-Threat Cases					
1,400 MIRVed ICBMs, existing payloads c/	9,100	9,159	350	60	71
820 MIRVed ICBMs, fractionation d/	15,000	15,120	400	78	90
1,400 MIRVed ICBMs, fractionation e/	23,000	23,485	450	106	121

NOTE: The table assumes U.S. deployment of a racetrack/horizontal shelter basing system for MX. The currently proposed system would use a linear grid system, but this change probably would not significantly alter costs shown above. All of the Soviet warheads shown in the table would not be used to attack a U.S. MPS basing system. Many would be used to attack fixed-based U.S. Minuteman and Titan missile silos. Moreover, it is assumed that only 85 percent of the Soviet missiles used to attack a U.S. MPS basing complex would be reliable. The number of shelters and MX missiles shown for each case represents the combination that would minimize the cost of an MPS basing system designed to provide 1,000 surviving warheads. The cost estimates were derived from the MX Cost Effectiveness Model developed by the Space and Missile Systems Organization of the U.S. Air Force.

a/ "Investment" includes research and development, procurement, and military construction costs. "Total" costs equal investment plus operating and support costs through fiscal year 1999.

b/ Assumes SALT II limit of 820 MIRVed ICBMs and no increase in the number of warheads carried on each missile.

c/ Assumes 1,400 MIRVed ICBMs and no increase in the number of warheads carried on each missile.

d/ Assumes SALT II limit of 820 MIRVed ICBMs and conversion of all missiles to carry larger numbers of 200-kiloton warheads.

e/ Assumes 1,400 MIRVed ICBMs and conversion of all missiles to carry larger numbers of 200-kiloton warheads.

by maintaining the current Soviet production rate of about 125 missiles annually. 16/ Adding these extra MIRVed ICBMs, even without increasing the number of warheads per missile above current levels, would give the Soviets 9,100 warheads on their MIRVed ICBMs. With this level of threat, the cost of an MX system that would ensure 1,000 surviving warheads would increase to $60 billion, or about 30 percent above base-case costs (see Table 6).

Alternatively, the Soviets could maintain the maximum number of MIRVed ICBMs permitted under the proposed SALT II treaty but exceed the treaty limitation on number of warheads per missile by "fractionating" their force (that is, placing a larger number of smaller warheads on each missile). If the Soviets were to fractionate their 820 MIRVed ICBMs in the CBO base-case threat, they could deploy 15,000 warheads (see Table 6). The costs of maintaining the same retaliatory capability of the MX system would then rise to $78 billion, or about 65 percent above the base case. Finally, the Soviets could both increase the number of MIRVed ICBMs and fractionate their payloads, resulting in a total threat of 23,000 warheads. The cost of an MX system that ensured 1,000 surviving warheads after a Soviet first strike would then increase to $106 billion, more than twice that of the base case (see Table 6).

These Soviet improvements would, of course, be expensive for the Soviet Union as well as for the United States. It might be possible to limit the Soviet threat through future arms control agreements, and it might also be possible to limit additional U.S. costs in ways discussed below. Nonetheless, the combination of possible cost increases and environmental concerns could force changes in the MX system, particularly in its basing mode.

Anti-Ballistic Missile Options. The Congress could choose to deploy the currently planned MX missile system. Then, rather than adding more horizontal shelters and MX missiles to counter an increased Soviet threat, the United States might decide to deploy an anti-ballistic missile (ABM) system, which might hold down costs. One concept--a "preferential" defense--would protect only those shelters that actually contained MX missiles. The Low Altitude Defense (LoAD) system--currently in the early stages

---

16/ U.S. Department of Defense, Annual Report, Fiscal Year 1981, p. 79.

of development--would be compatible with such a preferential defense. While CBO has not estimated the cost of an MX system defended by anti-ballistic missile interceptors, it could prove lower than some of those in Table 6. For fiscal year 1981, the Congress approved $282 million for research and development on anti-ballistic missile technology.

It is also possible that environmental or other concerns could prevent deployment of a large number of horizontal shelters. Should this occur, the Congress might decide to deploy some MX missiles in fixed silos, quite possibly modified Minuteman silos. A LoADs anti-ballistic missile system would then probably have to be added to protect the MX missiles. This option was raised in a recent nongovernmental study. 17/

Despite ABM's promise, a number of critical questions must be answered before the United States can proceed with these or other ABM systems. What will they cost? What are the technical risks? Will construction of an ABM system delay the MX program? Finally, deployment of any viable ABM system would almost certainly require abrogation of an existing U.S.-Soviet ABM treaty. While the treaty is subject to review in 1982, abrogation might be viewed as a setback for the arms limitation process.

Trident II Missile

The Congress might wish to hedge against problems in the MX program. Or it might want to expand U.S. strategic forces to match Soviet initiatives. In either case, the Congress might elect to accelerate the development of the Trident II submarine-launched ballistic missile program.

The Trident II missile might be an important hedge for several reasons. Its larger size means it could carry more warheads and/or have greater range than the Trident I missile. It could also potentially carry warheads with a larger explosive yield. In addition, the advanced guidance system on the Trident II would be designed to give it greater accuracy than Trident I at equal range. With its potentially larger yield and greater accuracy, the Trident II would provide U.S. strategic submarines

---

17/ See "The Los Alamos ABM Assessment," Congressional Record (June 6, 1980), pp. S6429-36.

with some ability to destroy targets hardened against nuclear blast, such as missile silos or command posts, which is one important capability of the MX missile. Finally, should the United States decide to expand its sea-based strategic forces substantially, the larger number of warheads on the Trident II would help hold down overall system costs. 18/

Development of the Trident II missile will cost approximately $9 billion to $10 billion over the next eight years. In fiscal year 1981, the Congress provided $65 million in development funds, and the Senate Appropriations Committee directed transfer of another $33 million from other projects to the Trident II program. These sums are roughly the amount needed in 1981 to begin a program that could achieve initial operating capability by 1989.

An accelerated program could allow deployment of Trident II missiles by mid-1988. The acceleration would add a total of $1.4 billion to baseline strategic costs in fiscal years 1982-1986 (see Table 7) and would require $250 million in added 1981 costs. 19/ But, in the long run, total system costs might actually be lower

TABLE 7. INCREASED COSTS ABOVE THE BASELINE OF ACCELERATING THE TRIDENT II MISSILE PROGRAM, FISCAL YEARS 1982-1986 (In millions of fiscal year 1982 dollars, net savings in parentheses)

	1982	1983	1984	1985	1986	Total
Added Costs (or Savings)	750	730	770	(120)	(740)	1,390

18/ Congressional Budget Office, The U.S. Sea-Based Strategic Force: Costs of the Trident Submarine and Missile Programs and Alternatives (February 1980), p. 34.

19/ The added costs could prove substantially higher than the number cited above, perhaps by as much as $1.7 billion. This would occur if the Administration proposed a lower funding profile than that assumed in the CBO baseline.

72-199 O - 81 - 5

if the Trident II program were accelerated. Until the Trident II is developed, the United States will outfit its Trident submarines with Trident I missiles. By accelerating the Trident II program, however, fewer Trident I missiles might have to be bought and then replaced with Trident IIs after only a few years' service.

Tanker Programs

Decisions about strategic missiles and bombers will not be the only strategic force issues confronting the Congress over the next five years. The Congress will also need to decide upon the size and composition of the fleet of tankers that provide aerial refueling for strategic bombers and other aircraft.

The current fleet of KC-135 tankers was originally designed and built to provide aerial refueling for the B-52 strategic bomber force. Although the entire KC-135 force is assigned to the Strategic Air Command (SAC), only about half of its peacetime sorties are devoted to SAC missions. The remainder support conventional missions, some of which require long-range deployments. Requirements for tanker capability on these missions have been steadily increasing. In fact, the Air Force has recently indicated that the equivalent of 1,000 KC-135 aircraft would be needed in operational units to meet expected wartime requirements. Yet the total fleet of 615 operational tanker planes has not grown over the last decade.

As a consequence, the Air Force has developed, and the Congress endorsed, two major programs to expand tanker capacity:

- Acquire a new, larger tanker, designated the KC-10; and
- Install more efficient engines (termed "re-engining") on the KC-135 to increase its range and payload.

These programs would increase tanker capacity, but at substantial cost. DoD has already bought 12 KC-10 aircraft and may propose procurement of another 14. These would cost $0.8 billion over the next two years. The baseline assumes re-engining of 288 KC-135 aircraft over the next five years, at a cost of $5.7 billion. Re-engining the remaining KC-135 fleet would add another $5.0 billion to this amount, for a total cost of $10.7 billion.

The Congress must determine the most cost-effective mix of KC-10s, re-engined KC-135s, and KC-135s that have not been re-engined. The answer will depend in part on desired levels of overall tanker capacity. This, in turn, will depend on other policy decisions: tanker requirements generated by the Rapid Deployment Force and other conventional missions; the number of new manned bombers that are procured, and when they are bought; and the fate of the B-52 fleet if a new manned bomber is procured.

The most desirable mix will also depend on which aircraft missions receive priority in using increased tanker fleet capacity, as well as on the relative efficiency of the various tanker aircraft. Preliminary CBO analysis indicates that the KC-10 is the more attractive alternative, if additional tanker capacity is intended for conventional roles, such as support of the Rapid Deployment Force. 20/ CBO analysis has not proceeded far enough to suggest which ways of improving tanker capacity would be most cost-effective for strategic missions.

COMMAND, CONTROL, AND COMMUNICATIONS

One issue that will almost certainly concern the Congress is the ability of the United States to command, control, and communicate with its strategic forces. Since this issue does not deal with forces and has both near-term and longer-term implications, it is addressed in this separate section. 21/

Functions and Problems of Current System

The U.S. strategic command, control, and communications (C^3) system includes an extensive collection of facilities and systems designed to control and direct nuclear forces prior to, during, and following a nuclear war. The system consists of early warning satellites and ground-based radars; specialized command centers, including command post aircraft; and elaborate communications systems. Functioning together, these components would

---

20/ A forthcoming CBO analysis, available in the spring of 1981, will cover these and other issues in more detail.

21/ This section draws on a forthcoming Congressional Budget Office paper.

alert authorities of a possible attack, facilitate an assessment of its approximate size and possible targets, and direct U.S. forces to respond as ordered by the President.

In recent years, improvements have been made in the U.S. C^3 system. Nonetheless, many observers consider that the strategic command, control, and communications system is among the weakest links in the U.S. strategic posture. Missile warning radars, ground stations for early warning satellites, and primary command centers are vulnerable to nuclear attack, or even to sabotage, and might be destroyed within the first few minutes of a war. Enemy jamming, poor radio propagation due to atmospheric nuclear explosions, and electromagnetic pulse caused by nuclear blasts might adversely affect the performance of communications systems that relay messages to the nuclear forces. In addition, the current strategic command, control, and communications system was not designed to support recently declared changes in strategic doctrine. These changes reportedly emphasize both flexible responses to limited Soviet attacks and operations throughout a potentially protracted nuclear conflict.

Improving Trans-Attack Responsiveness

One approach to correcting these problems would enhance the capabilities of the current C^3 system during the period of an initial strike against the United States (frequently called the "trans-attack" period). Such a period could last from minutes to hours, or even a few days. This approach characterized the thrust of the Carter Administration's program for improving command, control, and communications.

This option would procure additional warning sensors and improve existing ones to provide more timely and accurate information about an attack so that the President could better tailor retaliatory directives appropriate to the level of provocation, and in the very limited time available before Soviet warheads strike the United States. This option would also buy command posts and communications links that would help provide better control over the nuclear forces themselves. This might permit commanders to modify attack plans and redirect forces as circumstances change during the minutes to hours that might define the trans-attack period. Such an approach could add a total of $1.5 billion to the baseline over the next five years, as Table 8 shows.

TABLE 8. INCREASED COSTS ABOVE THE BASELINE OF C^3 MODERNIZATION ALTERNATIVES, FISCAL YEARS 1982-1986 (In millions of fiscal year 1982 dollars, net savings in parentheses)

Options	1982	1983	1984	1985	1986	Total
Improving Responsiveness in Trans-Attack Flexibility	710	270	140	180	150	1,450
Improving Endurance in Post-Attack Period a/	470	510	(260)	(230)	80	570
Improving Responsiveness and Endurance	730	790	200	260	230	2,210

a/ Net savings in this option result from cancellation of procurement of two E-4B command post aircraft.

The major disadvantage of this option would be its limited ability to endure and function over extended periods. The current system, even with the modifications discussed above, is characterized by limited numbers of critical yet vulnerable facilities, especially the land-based command centers, which could be destroyed quickly. While aircraft provide survivable command centers, they would require maintenance and runways in good condition to function for more than a few days after a nuclear attack. This limited system endurance creates doubt about the capability to control U.S. nuclear forces in a protracted conflict. Such conflicts have been discussed in recent years by the Secretary of Defense and reportedly were incorporated in Presidential Directive 59, which codified U.S. strategic doctrine.

Emphasizing Endurance

Recognizing the disadvantage of the first option, the Congress could choose to emphasize endurance as the primary objective

for modernization of the C^3 system. Implicit in such an alternative is the conviction that nuclear war would be better deterred if the attacker knows he cannot destroy his opponent's command structure or wait until it collapses. Under this option, the most important initiatives would emphasize both ground mobility and selective reconstitution of communications systems to improve survivability and endurance. New systems would include ground-mobile command posts, transportable communications systems, and reconstitutable satellite systems. This option would add a total of $0.6 billion to baseline costs over the next five years (see Table 8).

Improving System Responsiveness and Endurance

Of course, the weaknesses of the second option are exactly the strengths of the first. Thus, the Congress could decide to implement both approaches together. The total cost of this joint option would be an additional $2.2 billion over the next five years.

This $2.2 billion increase represents 1.7 percent of baseline strategic spending. The small relative size of this, the most expensive of the C^3 options, suggests that the Congress might be more concerned with the desirability of these approaches than with their costs.

RECAPITULATION: MANY PROGRAMS UNDER WAY, BUT KEY ISSUES REMAIN

As was noted above, there appear to be relatively few programs that could improve strategic capabilities in the near term. For the longer term, the Congress has already begun development or deployment of a wide variety of strategic systems, which are reflected in the sharp growth in baseline strategic costs.

Key issues remain, however. MX missile costs could grow sharply, particularly if the Soviet Union responded to the deployment of MX with a major strategic buildup of its own. Concerns over this possible cost growth, coupled with environmental problems, could force major changes in the MX system, including changes in its basing mode and possible use of anti-ballistic missile defenses.

Problems with MX could also emphasize the importance of accelerating the Trident II sea-based missile program as a hedge

against delays or problems in the MX program. And, regardless of decisions about forces, the relatively cheap proposals to improve the ability of the United States to communicate and control its strategic forces might be a key issue before the Congress.

The large number of strategic programs already under way suggests that, while discussions of strategic forces will surely occupy an important part of the Congressional defense debate, the major initiatives may come in general purpose forces. The next chapters address these forces, beginning with those aimed primarily at deterring or, if necessary, conducting a major war in Europe.

CHAPTER IV. GENERAL PURPOSE FORCES: NATO-RELATED ISSUES

U.S. general purpose forces include all ground forces, all naval systems (with the exception of ballistic missile submarines), the tactical air forces, and those mobility forces assigned to airlift and sealift. General purpose forces contain most of the manpower and account for most of the funding for the U.S. defense establishment. These forces are sized to meet the demands of what is termed a "one and one-half war" strategy. The larger part of these forces is committed to the "full war," usually assumed to involve the defense of NATO Europe in a conflict with the Warsaw Pact. The remaining forces are required to conduct operations in a non-NATO conflict. Such a conflict might occur without NATO involvement, or it could precede a NATO/Warsaw Pact war, with both conflicts continuing simultaneously. The demands of a NATO/Warsaw Pact war, focusing on Europe's central region, provide the primary determinants of U.S. force posture and programming. 1/

ENHANCING NATO'S CAPABILITIES: AN ALLIANCE-WIDE EFFORT

For most of the post-World War II period, the United States nominally gave NATO the highest priority for the use of conventional forces, even during the height of the Vietnam War. After the drawdown of U.S. military stocks in Europe during the Middle East War of 1973, however, the state of Europe's defenses, and the U.S. contribution to them, underwent critical review. It was found that the Warsaw Pact, which long had enjoyed a manpower advantage in Central Europe, had invested heavily in new and more

---

1/ It is extremely difficult to assign precise cost figures to the U.S. commitment to defend NATO. While such figures often have been presented to the Congress by the Department of Defense, they tend to involve arbitrary assumptions regarding the use of forces that could be committed either to NATO or to non-NATO contingencies. Such assumptions, which may not be universally shared, include allocation to a NATO contingency of the U.S. training and support establishments, U.S. naval and amphibious forces, and U.S. strategic forces.

capable equipment for its ground and air forces. As a result, it appeared to have a theater-wide advantage immediately after mobilization of nearly 2:1 over NATO in "armored division equivalents," a frequently used analytical tool for measuring the capabilities of ground forces. 2/ This ratio was considerably higher than the 1.5:1 Pact theater-wide advantage that expert opinion suggested as the theoretical upper bound needed to assure a conventional defense of Western Europe. 3/ Of special concern was--and still is--the Pact's favorable ratio of tanks (2.7:1), armored personnel carriers for infantry (1.2:1), and artillery (2.2:1). 4/ The Pact advantage appeared to be greatest with respect to NATO's Northern Army Group (NORTHAG), composed of German, British, Dutch, and Belgian forces that have been assigned responsibility for defending the North German Plain (see Figure 3). NATO planners also found serious shortcomings in their reinforcement plans, which not only would move U.S. forces to Europe too slowly, given revised estimates of available warning time, but also failed to account for serious allied shortfalls in war reserve equipment and spare parts.

In response to these perceived shortcomings, the NATO allies adopted, in 1977, the Long-Term Defense Program (LTDP). The LTDP committed each member to seek 3 percent annual real growth in defense outlays for the five years covered by the plan. 5/ It also set specific goals for the alliance as a whole. These goals addressed the areas of improved readiness, reinforcement, reserve mobilization, maritime posture, air defense, command and control,

---

2/ The use of armored division equivalents for calculating force ratios is not universally accepted. Nevertheless, it is DoD's standard measure of combat potential. See Congressional Budget Office, Strengthening NATO: POMCUS and Other Approaches (February 1979), pp. 52-53.

3/ Ibid., pp. 11-12, 54.

4/ Ibid., p. 9.

5/ The allies committed themselves to striving to achieve the 3 percent goal. Because their budgets are expressed in outlays, their performance must also be measured in outlays. The commitment to real growth in outlays is clearly more limited than one for 3 percent real growth in defense obligations (budget authority) would have been.

Figure 3.

Corps Sectors of Military Responsibility in NATO's Central Region

SOURCE: Adapted from Richard Lawrence and Jeffrey Record, *U.S. Force Structure in NATO* (Washington, D.C.: The Brookings Institution, 1974), p. 31 and also from U.S. Army materials.

[a] NORTHAG (Northern Army Group) and CENTAG (Central Army Group) are the two subdivisions of NATO forces in West Germany. The line dividing the two runs from Belgium through West Germany, just south of Bonn, and into East Germany.

logistics, theater nuclear modernization, and armaments planning and rationalization. 6/

The Carter Administration subscribed to the Long-Term Defense Program and put forward a series of programs consistent with--or responding directly to--its aims. These programs emphasize enhancement of U.S. ground force capabilities in the opening days of mobilization prior to a conflict with the Warsaw Pact. Programs to date have not proposed any expansion of U.S. ground force levels, nor have they called for any major expansion of Navy shipbuilding.

Thus, the Congress faces several key issues in considering programs to enhance the U.S. contribution to NATO:

- Should the United States continue its emphasis on improving capabilities in the early days of a major European conflict?
- Or should that emphasis be replaced by, or combined with, increases in force structure and shipbuilding?

This chapter suggests that the Congress has alternatives that would be consistent with either emphasis, or both. Improvements could be made in both the near and longer term. Which alternatives the Congress selects will be determined by the objectives it sets for U.S. conventional force capabilities.

Among the alternatives for near-term improvements are:

- Provide full or expanded funding for POMCUS, an Army program to speed deployment of U.S. reinforcements to Europe by prepositioning divisional equipment there.
- Increase ground forces based in the United States.
- Procure fast sealift ships to speed deployment of troops to Europe.
- Prestock Marine equipment in Norway and/or Denmark.

6/ The LTDP is summarized in Congressional Budget Office, Strengthening NATO: POMCUS and Other Approaches, pp. 63-65.

- Homeport an aircraft carrier in the port of a Mediterranean NATO ally.

- Increase funding for spare parts for Air Force tactical aircraft to improve their mission-capable rates.

Options for longer-term improvements include:

- Increase NATO ground forces by eleven and one-half fully supported armored divisions, with the United States contributing five.

- Concentrate U.S. shipbuilding programs on ships geared to long-distance projection missions, while the NATO allies assume responsibility for Atlantic convoy duty.

Influencing all Congressional decisions in this area is a key overall issue: the role of the NATO allies. If NATO is to improve its conventional capabilities, then the allies may have to match--or perhaps even exceed--U.S. efforts, particularly given the growing demand for improvements in U.S. military capabilities outside the NATO area. Yet none of the allies has matched the percentage of Gross National Product (GNP) that the United States devotes to defense. Furthermore, at least six of the allies have had difficulty even meeting the goal of 3 percent real growth in defense spending specified in the Long-Term Defense Program (see Table 9). This chapter points to the important linkages between U.S. and allied strengths when considering NATO forces and concludes with a section discussing the likely allied requirements imposed by the options discussed in this chapter.

NEAR-TERM IMPROVEMENTS FOR NATO: EMPHASIZING REINFORCEMENT AND READINESS

The following section highlights illustrative programs to enhance the ability of U.S. forces both to deploy rapidly to Europe and to be ready for combat whenever they are ordered to deploy. It also discusses the need for effective deployment of naval forces, so as to permit their timely involvement in the early stages of a possible NATO/Warsaw Pact conflict, while also supporting other requirements.

TABLE 9. COMPARISONS OF RECENT DEFENSE EXPENDITURES OF THE UNITED STATES AND THE NATO ALLIES (In percents) a/

	Defense Spending as a Percentage of GNP, 1979	Real Growth in Defense Spending, 1980
United States	5.2	3.1
Belgium	3.3	2.3
Canada	1.7	5.7
Denmark	2.0	0.7
Federal Republic of Germany b/	3.3	2.9
France	3.9	3.4
Great Britain	4.9	3.5
Greece	c/	c/
Italy	2.4	-7.7
Luxembourg	1.0	16.3
Netherlands	3.4	2.9
Norway	3.1	2.8
Portugal	4.0	c/
Turkey	c/	c/

SOURCES: Data on defense spending as a percentage of GNP taken from International Institute for Strategic Studies, The Military Balance, 1980-1981 (London, 1980), p. 96. Figures based on local currencies; GNP figures estimated where official statistics were unavailable. Data on real growth in defense spending taken from "Defence: The Special Case," The Economist (November 1, 1980), p. 17.

a/ These percentages do not reflect the full budgetary impact of manpower contributions by NATO allies with conscript armies.

b/ Includes aid to West Berlin.

c/ Not available.

The POMCUS Program

The POMCUS (Prepositioned Overseas Materiel Configured to Unit Sets) program is a major Army initiative to accelerate deployment of U.S. reinforcing divisions to Europe by storing division sets of equipment there. (Duplicate equipment is maintained in the United States for training.) In a mobilization, only the troops themselves and a small amount of remaining equipment would have to be moved from the continental United States, which could be accomplished within ten days.

By the end of 1980, the Army had prepositioned equipment for four divisions in Europe: the "2 + 10" package, 7/ the Reforger package, 8/ and a fourth division set. Two more division sets are scheduled to be prepositioned by the end of fiscal year 1982, and prepositioning of more than six division sets is under consideration.

Full Funding. Although the POMCUS program is key to the Carter Administration's program to improve NATO capabilities after mobilization, the program may be underfunded. CBO analysis found that the proposed budgetary plans of the Department of Defense through fiscal year 1986 could not fully fund even a six-division program, much less a larger one, while maintaining roughly current levels of equipment for U.S.-based active and reserve divisions. The funding shortfalls involve support and various combat-essential items (such as tactical communications equipment) and amount to $800 million for the first six division sets and $410 million for each additional set. 9/

Shortages also exist in prepositioned war reserve stocks—equipment required to support wartime operations while factories are converted to produce more materiel. Part of this shortfall

---

7/ The term "2 + 10" denotes a set of prepositioned equipment for two divisions plus ten support units. It was first used in response to the 1961 Berlin crisis.

8/ "Reforger" is an acronym for "Return of Forces to Germany." The Reforger equipment package supports one division, an armored cavalry regiment, and 74 nondivisional units.

9/ Congressional Budget Office, Costs of Prepositioning Additional Army Divisions in Europe (August 1980), p. 1.

has resulted from using reserve stocks to fill POMCUS sets. Bringing prepositioned war reserve stocks up to a minimum level would cost about $1.85 billion over a five-year period. 10/

Still another requirement--as yet unfunded--that is critical to the POMCUS program is a logistics base in NORTHAG to support the three divisions that are scheduled to have equipment prepositioned in that region. A skeleton logistics base would cost approximately $790 million over five years. 11/

Problems With POMCUS. The POMCUS program is closely tied to very specific assumptions about the length of warning time preceding a Warsaw Pact attack. If those assumptions are not correct, POMCUS becomes less useful, even if it is fully funded. POMCUS stocks would be highly vulnerable to a no-warning attack, for example, and would be of diminishing importance if warning time was measured in weeks rather than days.

POMCUS would also be less relevant in a protracted conflict. Even with POMCUS speeding U.S. deployments, the Warsaw Pact--and particularly the Soviet Union--could mobilize enough divisions to restore force ratios by the 35th day after mobilization. 12/ Thus, POMCUS might not provide a significant offset to the balance of forces in a conflict whose start is sudden or duration is prolonged.

Some of these problems, together with the funding concerns discussed above, led the Congress, in the fiscal year 1981 defense appropriations act, to prohibit any future expenditure for prepositioning the fifth and sixth POMCUS division sets without specific appropriations. 13/ This action came despite some

---

10/ Ibid.

11/ Ibid.

12/ Congressional Budget Office, U.S. Ground Forces: Design and Cost Alternatives for NATO and Non-NATO Contingencies (December 1980), p. xv.

13/ "Conference Report on H.R. 8105, Defense Department Appropriations, 1981," reprinted in Congressional Record (December 4, 1980), p. H11971.

discussion within the Carter Administration of expanding the POMCUS program to include as many as nine divisions. 14/

Alternatives to POMCUS: Force Increases or Fast Sealift

Force Increases. Current Congressional concerns about NATO strength emphasize the importance of considering alternatives to the POMCUS program. One alternative would create additional U.S. Army divisions, to be based in the United States. This approach would respond to concerns about capabilities later in a war, or in a war preceded by a long mobilization period. In addition, were the NATO allies and the United States to increase their force levels in order to add to NATO's defenses after the first month of mobilization, POMCUS might be less valuable to the allied position.

For example, if NATO added the equivalent of six fully supported armored divisions to its force levels, it could significantly improve its ability to maintain an elastic defense of Western Europe--one that would trade territory for the time needed to establish a defense. 15/ The U.S. share of such an initiative--based on relative sizes of the Gross National Products of the NATO allies as well as on other considerations --would be two divisions. The United States could add two fully supported armored divisions to its force structure within the next five years, probably not much later than the full requirement for six POMCUS division sets could be met. 16/ The cost of adding two fully supported divisions to the U.S. Army structure, in addition to filling equipment shortfalls in the four current POMCUS division sets, would be $14.2 billion over the five-year period fiscal years 1982-1986.

Fast Sealift. A more modest alternative to POMCUS would involve procurement of fast sealift ships, such as the SL-7 class

---

14/ Congressional Budget Office, Costs of Prepositioning Additional Army Divisions in Europe, p. 3.

15/ See Congressional Budget Office, U.S. Ground Forces: Design and Cost Alternatives for NATO and Non-NATO Contingencies, pp. 79-80.

16/ Ibid., p. 86.

72-199 O - 81 - 6

of container ships that the Congress funded together with the maritime prepositioning program in the fiscal year 1981 budget. Sixteen of these ships could move two divisions and their equipment to Europe within two weeks. (There would, of course, be some risk of loss of these convoys if the war had started.) These ships not only could be employed to reinforce Europe; they would also be valuable sealift assets for non-NATO scenarios. Thus, they need not be tied to the LTDP, and could merit consideration regardless of allied decisions. The procurement cost of these ships would be $4 billion. (Because no new construction was required, procurement of the SL-7s cost $285 million, with modifications to make them capable of rolling equipment on and off their decks estimated at an additional $450 million to $600 million.)

It is also possible to envisage circumstances in which the Congress might wish to reconsider the POMCUS program without taking compensatory steps. It might reason that the United States should not add to POMCUS stocks as part of its commitment to the LTDP if the NATO allies do not meet their commitment to the LTDP, namely to increase their defense budgets in real terms by 3 percent annually.

Prestocking in Northern Europe

Like the POMCUS program, the proposal to prestock Marine equipment in Norway, and possibly in Denmark, would enable U.S.-based reinforcements to deploy rapidly to northern Europe in the event of a crisis that might precede a major NATO/Warsaw Pact conflict (see Figure 4). 17/ (The Marines have been considered the prime candidates for such a program because they long have been designated as potential reinforcements for either or both countries in the event of hostilities on NATO's northern flank.) Unlike the POMCUS program, however, funds were not requested in fiscal year 1981 to fund prestocking of equipment in either Norway or Denmark, although agreement has been reached with Norway to prestock a Marine brigade there. The five-year cost of prestocking equipment for a Marine brigade in Norway could amount to $209 million, excluding operating costs. Prestocking equipment

---

17/ This discussion draws upon analysis in Congressional Budget Office, The Marine Corps in the 1980s: Prestocking Proposals, the Rapid Deployment Force, and Other Issues (May 1980).

Figure 4.

NATO's Area of Concern in Europe and Western Asia

for as much as one Marine division in Denmark (that size may be required to reinforce Denmark) could cost $1.5 billion, excluding operating costs. 18/

The Marines--which comprise only three divisions--have other missions within the overall context of the "one and one-half war" strategy, however. Prominent among these is their growing role as part of the Rapid Deployment Force (RDF). The Marines also continue to serve as a strategic reserve for NATO's forces in the Central Region. In the absence of increases in NATO force levels in that region, the demand for Marines in the Central Region might assume higher priority, so that few, if any, Marine units would be available for northern European operations.

In view of these factors, the Congress might consider that other allies, such as Great Britain and Canada, which contribute forces to the defense of the northern region, as well as the Norwegians and particularly the Danes, might provide additional forces for the defense of that area. Such contributions would facilitate a redistribution of NATO's defense burden to permit the Marines to operate in areas that might be formally outside the geographic boundaries of the NATO alliance, but involve economic interests as critical to Europe as to the United States.

Maintaining a U.S. Naval Posture in the Mediterranean

Ground forces are, of course, not the only forces that would determine the outcome of a European war. Naval forces would also play a major role. For nearly 30 years, the United States deployed at least two carrier battle groups in the Mediterranean Sea. These deployments embodied a general U.S. commitment to NATO to provide two naval task forces to support NATO units within 48 hours of the outbreak of a conflict with the Warsaw Pact. The carrier forces also represented a symbol of more specific U.S. commitments: the security of Israel and, more recently, of Egypt; and the defense of Greece or Turkey, or both, in the event of a Warsaw Pact attack on their territory. Since late 1979, however, the United States has maintained two carrier battle groups permanently on station in the Indian Ocean. In order to do so, and to limit the time that sailors had to spend continuously at sea, the Navy had to reduce its forward-deployed Mediterranean

---

18/ Ibid., p. 55.

(as well as Pacific) carrier forces, leaving one carrier with the Mediterranean Sixth Fleet, and one Seventh Fleet carrier in the western Pacific.

A case might be made against returning to the year-round deployment of two carriers in the Mediterranean. Recent harassment of U.S. tactical air forces by Libyan aircraft, continuing Soviet deployments in the Mediterranean, and ongoing U.S. commitments to regional friends and allies do appear, however, to justify maintaining the current deployment of one Sixth Fleet carrier battle group. The carrier's vulnerability to a surprise attack from submarines, surface ships, and bombers based in the Soviet Union could be minimized if it operated primarily in the western portions of the Mediterranean Sea.

The United States has 13 large-deck carriers, all of which are needed to support current deployments. These are not sufficient to maintain a carrier on full-time deployment in the Mediterranean, if it is assumed that two carriers in required to deploy in both the Indian and Pacific Oceans. Recent events in Asia point to a renewed requirement for maintaining a constant presence of sea-based aviation in the Indian and Pacific Oceans. Instability in the Persian Gulf region appears to call for continuation of the present deployment of two carriers in the Indian Ocean. 19/ Similarly, a Soviet ground force buildup north of Japan, as well as growing Soviet use of Southeast Asian naval facilities, may require a return to the former deployment pattern of two carriers in the Pacific. 20/

Because ship construction takes several years--and carrier construction consumes the better part of a decade--there is little that the United States can do in the short term to maintain

---

19/ An earlier CBO study indicated that at least two carriers would be required to support operations of U.S. projection forces, such as the Rapid Deployment Force. See Congressional Budget Office, U.S. Projection Forces: Requirements, Scenarios, and Options (April 1978), p. 24.

20/ An earlier CBO study pointed out that conditions in the northwest Pacific alone might justify the deployment of two carriers to that region. See Congressional Budget Office, U.S. Naval Forces: The Peacetime Presence Mission (December 1978), pp. 22-23.

a carrier deployment in the Mediterranean without reducing naval force levels in the Indian or Pacific Oceans. One way to maintain NATO's current naval firepower in the Mediterranean in the short term would be to homeport a carrier at a Mediterranean port. Homeporting reduces transit time and permits more carriers on station without increasing the at-sea times of ships' crews. If a carrier were homeported at an allied port in the Mediterranean, a 13-carrier fleet could sustain the full-time forward deployment of a Mediterranean carrier while maintaining current Indian Ocean deployments and permitting the nearly full-time deployment of two carriers in the Pacific. 21/

Homeporting requires allied cooperation, however. There have been no offers for homeporting forthcoming from any of the European allies. Were such an offer made, it would be necessary to provide infrastructure to support the homeporting arrangement for a carrier at a well-developed Mediterranean port. Approximately $650 million would have to be added to the baseline for required military construction costs.

Tactical Aviation Readiness: The Spare Parts Issue

The equipment and materiel shortages arising from the POMCUS program and the availability of naval forces in the Mediterranean are but two limitations that could affect the readiness of U.S. forces to conduct immediate and sustained operations in a major conflict with the Warsaw Pact. A series of related issues affect the readiness of U.S. tactical air forces to conduct their wartime missions.

One such issue concerns the availability of spare parts for Air Force aircraft: How much funding for aviation spare parts is required to support tactical air forces at a high state of readiness?

Recent aircraft availability trends (from fiscal years 1978 to 1980) actually point to an improvement in the percentage of mission-capable Air Force fighter and attack aircraft (see

---

21/ The homeporting calculation includes overhaul as part of the deployment cycle. For a discussion of carrier deployment cycles and their calculation, see Ibid., pp. 75-80.

Table 10). 22/ (The "mission-capable rate" refers to the proportion of aircraft available to perform their primary mission.) This improvement, however, appears to be more a product of better management of maintenance resources than of greater availability of spare parts. In the future, additional funding for spare parts might be necessary to permit sustained peacetime tactical air operations at preferred mission-capable rates.

TABLE 10. MISSION-CAPABLE AND NON-MISSION-CAPABLE RATES FOR AIR FORCE TACTICAL AIRCRAFT, FISCAL YEARS 1978-1979 (In percents)

Rate	1978	1979	1980
Mission Capable	57.7	59.2	60.9
Not Mission Capable Because of Supply	6.5	6.6	7.5
Not Mission Capable Because of Maintenance	28.3	25.9	22.8
Not Mission Capable Because of Supply and Maintenance	7.5	8.3	8.8

NOTE: Data for F-4, F-15, F-16, F-111, and A-10 aircraft.

22/ This finding applies to all aircraft types. Mission-capable rates will vary by type, however. Furthermore, shortages in war reserve materiel are not reflected in these rates. Finally, preliminary CBO findings raise the question of the relationship between a recent record of improved maintenance capability and the reported shortfall in experienced personnel. This issue will be explored in a forthcoming CBO study.

CBO has estimated that, beginning in mid-year 1981 and throughout fiscal year 1982, $250 million would have to be added to annual expenditures for Air Force spare parts to achieve the Air Force's peacetime goal of 70 percent mission-capable aircraft by fiscal year 1983. 23/ Because of the lead times involved, it would take about 18 months for the enhanced funding to be reflected fully in mission-capable rates; thus, the mission-capable rates for fiscal years 1981 and 1982 could not be affected by budget decisions regarding spare parts made this year.

The Near-Term Options

The preceding discussion illustrates only some of the many options available to the Congress for improving NATO capabilities in the near term. Table 11 summarizes the costs of these options, which range from $209 million to $14.2 billion above the baseline. Other readiness issues--concerning Navy ships, Army equipment, and Navy and Marine tactical aircraft--as well as questions about the adequacy of current equipment stockpiles for sustained wartime operations might also be considered by the Congress.

Even this brief discussion of near-term alternatives does, however, highlight the importance of an allied approach to solving near-term problems. Only with assistance from its allies is the United States likely to be able to make near-term improvements in NATO forces while also addressing longer-term issues.

LONGER-TERM IMPROVEMENTS FOR NATO: INCREASING GROUND AND MARITIME FORCE LEVELS

The United States' commitment of both ground and maritime forces to NATO is part of an alliance-wide effort to deter an attack by the Warsaw Pact on one or more of NATO's members.

23/ This additional funding would allow the Air Force to terminate its current practice of "borrowing" from war reserve spares kits. If that practice were programmed to continue, additional funding required to achieve the 70 percent goal could drop to about $90 million. To achieve the 70 percent goal in fiscal year 1984 and thereafter would also require additional funding; specific estimates were not available for this report.

TABLE 11. INCREASED COSTS ABOVE THE BASELINE OF VARIOUS NEAR-TERM ENHANCEMENTS FOR NATO-RELATED FORCES, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

Program	1982	1983	1984	1985	1986	Total
Full Funding for Four POMCUS divisions a/	0.8	0.7	0.5	0.5	0.4	2.9
Add Two Fully Supported U.S.-Based Armored Divisions to Force Structure and Fully Fund Four POMCUS Divisions	3.9	4.1	2.4	1.9	1.9	14.2
Acquire 16 Fast Sealift Ships	1.0	1.0	1.0	1.0	0.0	4.0
Prestock Marine Equipment in:						
Denmark	0.0	0.4	0.5	0.5	0.1	1.5
Norway	0.1	0.1	0.0	0.0	0.0	0.2
Add Funding for Air Force Spare Parts	0.3	0.2	0.3	0.2	0.3	1.3
Homeport an Aircraft Carrier in the Mediterranean	0.3	0.3	0.1	0.0	0.0	0.7

a/ Includes prepositioned war reserve stocks and a logistics base in NORTHAG.

NATO's common economic and security interests do not reside solely in the treaty area, however. As recent naval deployments in the Arabian Sea and Indian Ocean have made clear, shared interests outside the region can lead to a multinational military effort outside NATO's boundaries, even if the alliance remains formally uninvolved. 24/ Nevertheless, the United States

24/ Great Britain has deployed ships in the Arabian Sea; France and Australia have deployed ships in the Indian Ocean.

possesses much of the West's power-projection capability, 25/ and must accept the possibility of having to undertake military operations outside the NATO region with only limited support from its treaty allies.

This factor raises the issue of burden-sharing within the alliance, in light of the significant contribution that the United States also makes to the direct defense of Europe. CBO analyses have found that NATO suffers from shortfalls in both ground and naval force capability beyond those discussed above in connection with the near-term alternatives. The degree to which U.S. resources are devoted to filling those shortfalls will depend to some extent on the additional resources that the NATO allies are prepared to contribute.

Ground Forces

DoD evaluates the capabilities of U.S. and allied ground forces against a threat of 90 Warsaw Pact divisions, and appears to rely on theater nuclear weapons either to deter attacks by larger forces or to neutralize them. As noted earlier, DoD has focused primarily on the need for rapid reinforcement of NATO forces and, therefore, has pressed for full implementation of POMCUS and is also considering the prestocking of Marine equipment in northern Europe. The Department's plans also include some improvements to combat forces, including theater nuclear and conventional ground-force modernization.

None of these improvements would reduce the risks associated with reliance on nuclear weapons to offset Soviet superiority in conventional forces. Furthermore, there is little likelihood that the Pact would confine an attack to a force of 90 divisions. A recent CBO analysis indicated that, if it acted as a bloc, the Warsaw Pact could commit 120 divisions to combat roughly 35 days after it mobilized. 26/

25/ In naval terms, power projection is the launching of sea-based air and ground attacks against enemy targets on-shore.

26/ Congressional Budget Office, U.S. Ground Forces: Design and Cost Alternatives for NATO and Non-NATO Contingencies, p. xv.

A combination of U.S. and allied initiatives could, however, provide a more robust conventional defense of Europe that would be less reliant upon nuclear weapons to offset Warsaw Pact conventional force superiority. In the near term, NATO could implement a strategy calling for an elastic defense of Western Europe--one that would trade territory for the time needed to establish a defense. Such a defense would require the equivalent of at least six fully supported armored divisions to be added to the NATO ground forces that are likely to be committed to the defense of the Central Region. 27/

In the longer term, NATO could implement a steadfast defense, geared to holding its territory at the East/West German border. This approach would require a still higher level of commitment on the part of the United States and its allies. NATO would add eleven and one-half fully supported divisions to forces that are likely to be committed to operations in Central Europe. Based on the relative size of allied GNPs and other considerations, the U.S. share of this increase would be five divisions.

Adding five divisions would require 115,000 additional troops for U.S. ground forces, including those for necessary support units. In addition, equipment would have to be purchased for the divisions and supporting forces, and a combination of new POMCUS sets and sealift assets would have to be procured to ensure that all five divisions could deploy to Europe within about 30 days of mobilization. The cost of adding five fully supported armored divisions to the U.S. Army structure, together with related expenditures for POMCUS sets and sealift ships, would total $38.9 billion over the five-year period fiscal years 1982-1986 (see Table 12).

Such a program could, of course, prompt a Soviet reaction and a greater Warsaw Pact force buildup. Regardless of Pact reactions, however, the costs of this program underscore the importance of an alliance-wide approach to rectifying the ground force balance in Europe. It is unclear whether the United States would commit funds of this magnitude to ground force augmentation for Europe unless the NATO allies made a commensurate contribution by adding six and one-half divisions to their own combined force structures.

27/ Ibid., pp. 20-21, 79-80.

TABLE 12. INCREASED COSTS ABOVE THE BASELINE OF GROUND FORCE ALTERNATIVES FOR THE U.S. POSTURE IN NATO, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total
Elastic Defense						
Add two armored divisions	3.9	4.1	2.4	1.9	1.9	14.2
Steadfast Defense						
Add five armored divisions	7.5	8.3	9.1	6.6	7.4	38.9

Naval Force Burden-Sharing

NATO requirements may create a substantial demand for increases in future U.S. shipbuilding programs. 28/ CBO has found that the NATO allies could contribute only 60 to 70 ships for convoy escort duty, since most of their surface escorts would likely be required for missions in local European waters. It is, of course, possible to assume that escort requirements might be quite low. For example, it could be assumed that few escorts would be required for each convoy, or that the Soviet Union would not inflict any losses on convoy escorts. Unless such optimistic assumptions are applied to requirements for defending convoys to Europe in the early days of a war, however, the shortfall in available escorts could exceed 160 ships if the Europeans were to contribute only 70 escorts. 29/

A second set of demands arises from changes in the deployment of the U.S. Sixth Fleet in the Mediterranean Sea. Part of these

28/ This discussion draws upon Congressional Budget Office, Shaping the General Purpose Navy of the Eighties: Issues for Fiscal Years 1981-1985 (January 1980), pp. 55-60.

29/ The likely shortfall could range between 101 and 217 ships; the midpoint is 159 ships.

demands, for both convoy protection and Mediterranean naval defenses, could be met by the NATO allies if they expanded their naval modernization efforts. Belgium, the Federal Republic of Germany, Great Britain, and the Netherlands are already committed to major modernization programs that emphasize improvements in ship quality. They and other allies, such as Canada and Denmark, could match their increased ship quality with some additional procurement, especially of convoy escorts. NATO allies could then bear most of the brunt of convoy defense. In addition, if supported by French carriers in the Mediterranean, as well as by additional German and Italian units, the allies could replace some of the Sixth Fleet units recently deployed to the Indian Ocean.

Increased efforts on the part of the NATO allies could have a significant impact on the shape of the U.S. shipbuilding budget. The current program includes funds for the relatively small $280 million FFG-7 guided missile frigate, which, like its counterparts in allied navies, is geared to defensive missions such as convoy escort. The U.S. program includes funds for only one class of large combatant, the $900 million CG-47 AEGIS cruiser, which likewise is geared primarily to defensive missions.

New naval commitments in the Indian Ocean, as well as continuing requirements for major force dispositions in the Pacific, call for a shipbuilding program geared to long-distance projection operations, however. Such a program would require additional major fleet escorts with greater offensive capabilities than the FFG-7, additional amphibious ships, and a variety of support ships, including repair ships and tenders.

A program geared to long-distance projection operations would also call for the construction of three aircraft carriers over the next five years. Two would be required as replacements for two older carriers that will retire by 1990. The third would ensure that, together with the Mediterranean homeporting arrangement noted earlier in this chapter, the United States could maintain five carriers on forward deployments at all times--two in the Indian Ocean, two in the Pacific, and one in the Mediterranean. 30/

30/ Additional aircraft carriers would also hedge against failure to secure a homeporting arrangement, even after an initial commitment to do so. Such a situation developed in the mid-1970s with the proposed homeporting arrangement for Souda Bay in Crete.

The United States could not maintain its current shipbuilding program and meet its additional shipbuilding requirements without a significantly higher budget than has recently been allotted to naval ship construction. If the allies increased their shipbuilding programs in order to assume full responsibility for convoy escort, however, the United States could devote a larger portion of its own shipbuilding resources to constructing other ship types for operations in regions outside NATO where the alliance has common and vital economic interests.

Table 13 sketches a shipbuilding program predicated on this assumption. It indicates that the program would add $16.0 billion to baseline costs over the five-year period fiscal years 1982-1986. It would add 33 ships to the baseline U.S. fleet by 1990, with an emphasis on types designed for power-projection operations at long distances.

The Longer-Term Options

The United States could pursue other longer-term approaches to enhance its capabilities in Europe. Most notable of these would be increases in tactical air force levels. Nevertheless, the preceding discussion again illustrates the important interaction among NATO requirements, allied commitments, and U.S. defense planning and programming. The land and naval force increments outlined above would add $55 billion to baseline costs (see Table 14). Realizing these increments may be critically dependent upon the willingness of the NATO allies to increase their own land and naval force capabilities as well.

RECAPITULATION: HOW MUCH WILL THE NATO ALLIES CONTRIBUTE?

This chapter has outlined only a few of the many issues arising from the U.S. commitment to the defense of NATO. Other issues include theater nuclear force modernization, potential increases in U.S. tactical air force levels, and more rapid modernization of U.S. ground force weapons. Nevertheless, as even the issues discussed in this chapter made clear, the nature and extent of U.S. ground and naval force modernization critically depend on what the allies contribute to NATO's defense. If the allies are to meet the demands for ground and naval forces outlined in the preceding sections of this chapter, they will have to sustain real growth in their total defense budgets. Just the

TABLE 13. CHANGES TO BASELINE SHIPBUILDING PROGRAM RESULTING FROM EMPHASIS ON ENHANCING THE NAVY'S CAPABILITY TO MEET MARITIME THREATS OUTSIDE THE NATO OPERATING AREA, FISCAL YEARS 1982-1986 (In millions of fiscal year 1982 dollars)

	1982		1983		1984		1985		1986		Total	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost	Number	Cost	Number	Cost
Increments to Baseline Force												
CVN a/	1	2,450	-	-	-	-	-	-	-	-	1	2,450
CV a/	-	-	-	-	1	1,460	-	-	1	1,220	2	2,680
LPH b/	-	-	1	720	1	570	-	-	-	-	2	1,290
LSD-41 b/	-	-	1	360	-	-	1	360	-	-	2	720
SSX c/	-	-	1	170	2	270	4	530	4	530	11	1,500
Attack DD (FFG-7 variant) d/	7	2,470	6	2,110	6	2,110	5	1,770	5	1,770	29	10,230
ADX c/	1	420	1	420	1	420	-	-	-	-	3	1,260
ARX c/	-	-	1	360	1	360	-	-	-	-	2	720
Total Increments	9	5,340	11	4,140	12	5,190	10	2,660	10	3,520	52	20,850
Reductions from Baseline Force												
FFG-7	-4	-1,130	-4	-1,040	-4	-1,040	-4	-1,130	-2	-560	-18	-4,900
Total Shipbuilding Program	5	4,210	7	3,100	8	4,150	5	1,530	8	2,960	33	15,950

NOTE: Costs are for procurement only. See Glossary for description of ship designations.

a/ Assumes that the first carrier will be a nuclear-powered, large-deck carrier, while later variants will be limited to 40,000-ton conventional carriers. The first two carriers are replacements for current ships; the third carrier would increase force levels. An additional $790 million would be required to procure an aircraft wing for the third carrier.

b/ Derived from Option III in Congressional Budget Office, The Marine Corps in the 1980s: Prestocking Proposals, The Rapid Deployment Force, and Other Issues (May 1980), p. 60.

c/ Derived from Option III in Congressional Budget Office, Shaping the General Purpose Navy of the Eighties: Issues for Fiscal Years 1981-1985 (January 1980), p. 115.

d/ Derived from Ibid., with 25 percent cost increment for major modifications of FFG design.

TABLE 14. INCREASED COSTS ABOVE THE BASELINE OF VARIOUS LONGER-TERM ENHANCEMENTS FOR NATO-RELATED FORCES, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total
Add Five Fully Supported U.S.-Based Armored Divisions to Force Structure	7.5	8.3	9.1	6.6	7.4	38.9
Increase Current Shipbuilding Plan	4.2	3.1	4.2	1.5	3.0	16.0

investment costs of such a program would, over the next five years, require two-thirds of the 3 percent real growth to which the NATO allies are now pledged. 31/ To the extent that the allies have other plans for the 3 percent increase, the investment costs would have to be financed by an even higher growth rate.

31/ Total spending for the non-U.S. NATO allies (including France) in 1980 amounted to $97.9 billion. (See International Institute for Strategic Studies, The Military Balance, 1980-1981 (London, 1980), p. 96. Data for Turkey were available only for 1979 and were inflated to 1980 dollars.) The five-year investment cost of initially equipping the additional six and one-half divisions for NATO forces would be $8.8 billion (in 1980 dollars). A five-year program to construct 160 antisubmarine warfare escorts would cost $20.8 billion, assuming a $130 million cost (1980 dollars) per ship.

Some of the NATO allies are not now even increasing their defense budgets by 3 percent in real terms. Their inability to do so may require some rethinking of the best allocation of U.S. defense resources for NATO, especially in light of growing demands for U.S. military capabilities outside the NATO area. These demands are discussed in the next chapter.

72-199 O - 81 - 7

CHAPTER V. GENERAL PURPOSE FORCES: OPERATIONS OUTSIDE THE NATO AREA

During the past year, the Carter Administration devoted increasing attention to requirements for military operations outside the NATO area. This emphasis reflected great concern over the security of free world access to Persian Gulf oil, heightened by the Soviet intervention in Afghanistan in December 1979. The centerpiece of the Administration's program for non-NATO contingencies is the Rapid Deployment Joint Task Force (hereinafter referred to as RDF), an aggregation of Marine and Army divisions, Air Force wings, carrier battle groups, and supporting mobility forces. These forces, totaling some 200,000 active-duty troops, with as many as 100,000 reserves, could be available to the newly designated commander of the RDF.

In principle, the RDF is dedicated to missions anywhere outside the NATO area. In fact, Persian Gulf contingencies would appear to be the most demanding in terms of the speed of response and level of force that might be required, as well as operating distance from the continental United States.

Because access to Persian Gulf oil is also critical to the NATO allies, as well as to Australia and Japan, these nations might be expected to contribute to any efforts that were required in the region. 1/ In fact, Australian, British, and French warships joined U.S. vessels in expanding the Western naval presence in the Indian Ocean during the opening weeks of the Iran-Iraq war. Nonetheless, the potential military requirements of a Persian Gulf contingency imply that the main burden of conducting military operations in that region is likely to fall on the United States.

Any assessment of the role of the RDF in a Persian Gulf contingency, or in operations elsewhere, raises several key questions:

1/ See Dov S. Zakheim, "Towards a Western Approach to the Indian Ocean," Survival (January/February 1980), pp. 7-14; and Dov S. Zakheim, "Of Allies and Access," The Washington Quarterly (Winter 1981).

- What is the scope and cost of the RDF program as proposed by the Department of Defense?
- What additional programs might be required to ensure that the RDF can fulfill its mission successfully?
- How might these programs vary according to the nature of the conflict and the type of force encountered?
- How much would these programs add to baseline costs?

This chapter addresses these questions, beginning with costs of the current RDF program and then turning to alternatives for the near term and longer run.

THE CURRENT RDF PROGRAM: FEW INITIATIVES IN THE BASELINE

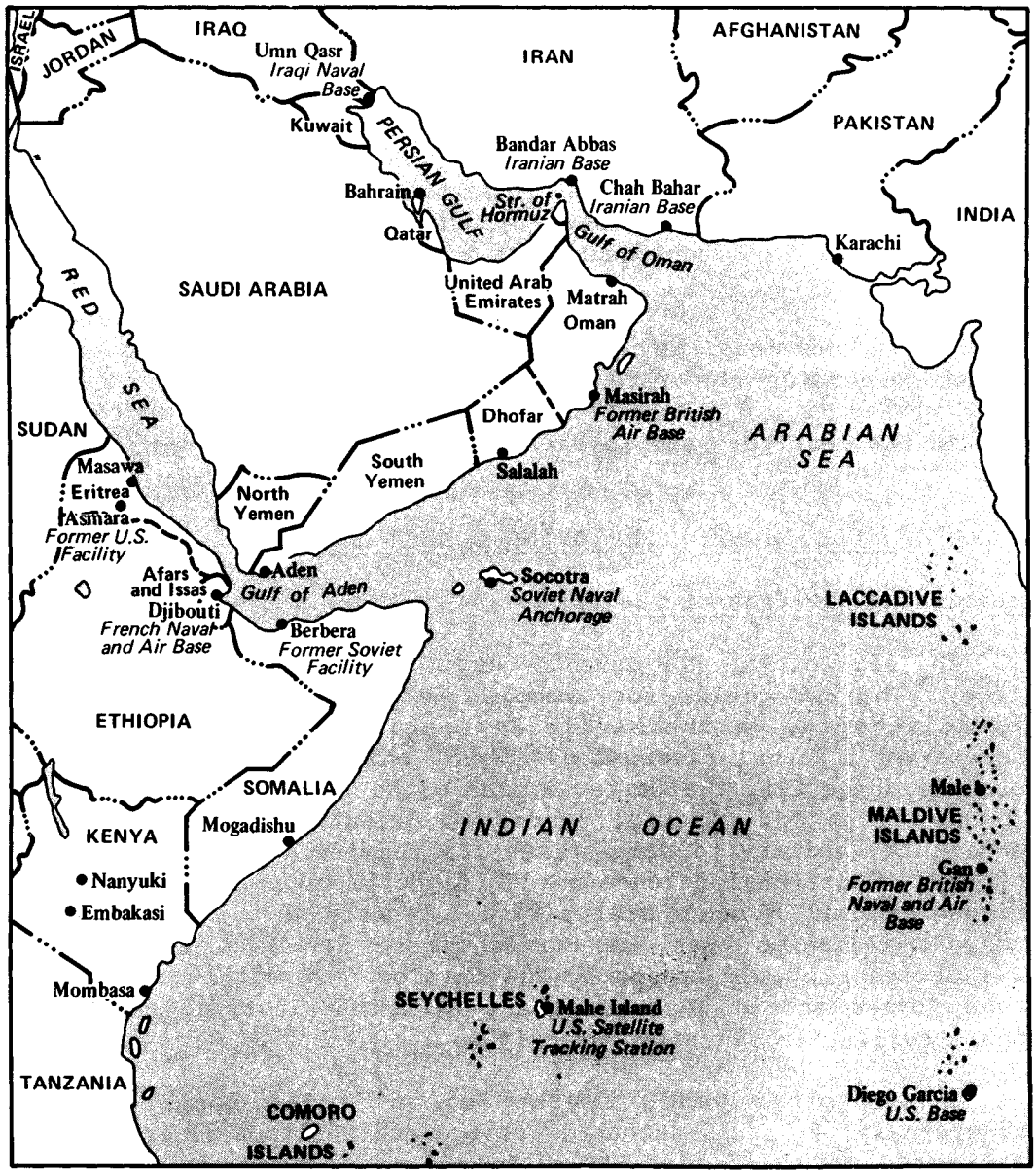
Over the next few years, the RDF—as currently programmed—will involve no force structure additions. The Department of Defense has, however, proposed some new programs to improve the capabilities of U.S. forces in light of RDF mission requirements. These programs, some of which could eventually add to U.S. forces, include:

- Procurement of additional airlift and sealift assets;
- Acquisition of new weapons for forces that are earmarked for operations in non-NATO areas;
- Funding of military operations in the Indian Ocean at a tempo higher than peacetime operations elsewhere; and
- Negotiation of access rights to bases in the Persian Gulf region and extensive military construction to improve them.

Most of the expenditures related to these initiatives represent pay and allowances for personnel and operating costs for equipment already in the U.S. forces. The only added costs would be for research and development; military construction on the Indian Ocean atoll of Diego Garcia and at facilities provided by Oman, Somalia, and Kenya (see Figure 5); and procurement of some new systems, primarily a new class of cargo ships (termed T-AKX). These added costs amount to about $2.7 billion in fiscal years 1982-1986.

Figure 5.

The Indian Ocean Region



SOURCE: Adapted from Dale H. Tahtinen, *Arms in the Indian Ocean: Interests and Challenges* (Washington,D.C.: American Enterprise Institute, 1977).

The DoD program is quite limited in scope. It is focused almost solely on increasing the speed with which forces could be moved to the Middle East, although DoD has not clarified the nature of RDF missions that might justify the program's heavy emphasis on speed of deployment. As noted earlier, the program provides for no increases in active or support troop levels. It appears to assume that local "host" nations will make their facilities available in a crisis. The program also does not address the demands of landing operations that might have to be conducted in the face of local opposition. Nor does it provide for any specialized equipment that might be required for Persian Gulf operations.

These questions suggest that the Congress faces important issues concerning the role and nature of the RDF. Answers to these questions could significantly affect the costs of the RDF both in the near term and in the longer run.

NEAR-TERM DECISIONS: IMPROVING COMBAT SUPPORT AND FIREPOWER

Determining the Size of the RDF

The size of the RDF depends on whom the force is expected to fight. The RDF could, for example, be called upon to support a friendly regime in the Middle East against external regional threats or internal dissension. With "collective security" as a possible objective, the United States might provide only a portion of the troops and materiel needed to defend an ally, but would require the ability to demonstrate its commitment quickly to that country. Additional defense forces might be supplied by the ally in question and by other states with interests in the region. CBO analysis indicates that, at current force levels, the RDF could move at least 20,000 troops to the Persian Gulf within two weeks. These forces should be an adequate U.S. contribution to satisfy such a collective security objective. 2/

On the other hand, if the United States sought to act unilaterally, it could encounter severe difficulties if the threat were posed by the Soviet Union in an area contiguous to Soviet

---

2/ See Congressional Budget Office, U.S. Ground Forces: Design and Cost Alternatives for NATO and Non-NATO Contingencies (December 1980), p. 47.

borders. The United States could unilaterally counter Soviet operations against states not bordering the Soviet Union, but would require substantial combat forces with appropriate additional firepower and support units. 3/

The current DoD program does not provide the additional armored firepower and combat suppport required for an RDF operation against Soviet forces or, in some circumstances, against the armored forces of leading regional powers. Deficiencies in armored firepower are most marked with respect to the Marine Corps, which, as currently structured, remains primarily a foot-infantry force, deriving considerable fire support from its integrated air wings. Both the Marine Corps and the Army have shortfalls in combat support.

Added Combat Support

The RDF could require as many as 60,000 to 70,000 additional support troops. 4/ These forces could be acquired in the next several years if the Marine Corps and the Army were expanded to provide the necessary spaces for them. Aside from the costs of recruiting and paying these additional personnel, acquiring equipment for them would require an additional $2.7 billion.

The United States could avoid these added costs if the support units were transferred from forces now dedicated to NATO. Reducing NATO forces would not, however, appear consistent with the assumption that the RDF might have to confront Soviet forces. In that case, the United States presumably would wish to maintain its NATO forces in a high state of readiness, in the event that a Persian Gulf conflict led to a NATO/Warsaw Pact war.

Added Firepower

Providing additional firepower for the RDF in the next five years is a more difficult task than providing added combat support. The United States has no light armored vehicles currently in production. Yet the Marine Corps might need such a vehicle

---

3/ Ibid., pp. xix-xx.

4/ Ibid., p. xx.

because it is relatively easy to transport and provides some protection and firepower once in place. Research and development on lightweight vehicles--both on antitank systems and armored personnel carriers--could be accelerated, however. Such vehicles would be compatible with Marine heavy-lift helicopters and new landing craft, and would enhance Marine tactical and battlefield mobility as well as firepower. They would also enable the airlift fleet to deliver firepower more quickly to the Middle East. For example, the Army's new XM-1 tank can be lifted only by the C-5, and it can carry only one XM-1 at a time. On the other hand, the C-5 could lift six lightweight armored vehicles, and even the smaller C-130 transport could lift one of them.

If research and development for these vehicles were accelerated, they could be introduced into the Marine Corps by 1984. 5/ In the interim, the Marines could acquire foreign-built light armored vehicles, to enable them to train and develop new tactics for the employment of such systems in the immediate future. 6/ A five-year program combining both acquisition of foreign-built systems and accelerated development and procurement of a U.S.-made system would add $420 million to baseline costs.

Composition of the RDF

The current DoD program appears to assume the unopposed entry of forces by air and sea into the Persian Gulf region. Such an assumption might not be warranted under all circumstances, however, particularly in a scenario involving unilateral U.S. operations against a regional adversary or the Soviet Union. Altering this assumption could affect which service provides the RDF's initial ground force component.

The Congress may reason that the most likely contingencies would involve operations in which facilities of friendly host

---

5/ See Congressional Budget Office, The Marine Corps in the 1980s: Prestocking Proposals, the Rapid Deployment Force, and Other Issues (May 1980), p. 60.

6/ Foreign-built systems might be found to meet all Marine Corps requirements. In that case, procuring them might be a faster and less expensive alternative to developing a new U.S.-built vehicle.

nations might not be immediately available to U.S. forces. Under such conditions, the initial ground force element in any Persian Gulf operation would probably be the Marines. The Marines train for amphibious assault against an entrenched opposition and do not initially require land-based facilities for their operations.

A decision to emphasize amphibious operations would have long-term implications for the amphibious shipbuilding program, as discussed in the next section. It would also reinforce arguments in favor of near-term programs to provide light armored vehicles for the Marine Corps. It should be noted, however, that, even if the Marines were to provide the bulk of initial deploying RDF units, the Army would have to provide follow-on forces in a major confrontation with the Soviet Union in the Middle East. As a result, combat support requirements for the RDF must relate to the needs of both the Marine Corps and the Army.

The costs of the near-term improvements discussed above are shown in Table 16 at the end of this chapter.

LONGER-TERM ISSUES: TAILORING MOBILITY INVESTMENT PROGRAMS TO REQUIREMENTS

The near-term RDF improvement issues focus on providing additional firepower and combat support. Yet the United States must also be able to transport its forces and equipment to distant areas like the Persian Gulf, where they might have to land against opposition. Improvements in mobility can only take place over the longer term, since aircraft and ship procurement usually requires the better part of a decade.

While the United States could move small units quickly, transporting units of division size or larger could consume several weeks, even using all available aircraft. 7/ If the planes in the Civil Reserve Air Fleet were not available, even more time would be required. For this reason, DoD has proposed to augment current airlift capabilities with a new transport aircraft, designated CX (for Cargo Experimental), and to construct a new class of cargo ships to support augmented levels of equip-

---

7/ Congressional Budget Office, U.S. Airlift Forces: Enhancement Alternatives for NATO and Non-NATO Contingencies (April 1979), p. 57.

ment that might be prepositioned overseas near potential crisis areas. The DoD program also provides for acquisition of roll-on/roll-off ships that could move an Army division from the United States to the Persian Gulf region in about two weeks.

This section first discusses the programs that have been proposed by the Department of Defense or added by the Congress to augment sealift and airlift forces. While implementation of these programs would indeed enhance the speed with which the RDF could deploy to the Middle East or elsewhere, none would enhance the force's ability to enter the region forcibly against enemy opposition. Thus, the section concludes with a discussion of increasing amphibious lift as a way of enhancing capability for forcible entry.

Augmenting Sealift Programs: Maritime Prepositioning Ships

As part of its effort to increase the speed with which the RDF could deploy overseas, DoD proposed a two-step program for prestocking equipment for RDF ground and tactical air forces on cargo ships homeported overseas. As a near-term step, DoD acquired or leased seven ships, including water and petroleum tankers, which were deployed to the Indian Ocean atoll of Diego Garcia. These ships carry supplies for a Marine Amphibious Brigade.

For the longer term, DoD has proposed the acquisition of 12 additional maritime prepositioning ships to support the RDF prestocking program. Four of these ships would be currently available commercial roll-on/roll-off ships, modified to meet the demands of moving military equipment ashore rapidly. Eight additional ships would be built to similar specifications. The DoD program is estimated to cost $2.2 billion. DoD requested $207 million in fiscal year 1981 to begin construction of the first new maritime prepositioning ship, termed T-AKX. It planned to begin the first modification of currently available roll-on/roll-off ships early in fiscal year 1982.

While the Congress has supported the DoD program in principle, it has sought an even more rapid acquisition of additional sealift capability. To that end, it appropriated an additional $285 million in fiscal year 1981 for the acquisition of other commercial fast container ships (SL-7) which, if modified to have a roll-on/roll-off capability, could support deployment of the RDF as well as forces deploying to Europe. The Congress also

directed the Navy to examine other possibilities for the quick charter or purchase of existing privately owned sealift assets. Finally, the Congress voted $33 million in advance funding for new construction of T-AKX ships, indicating that it supported this aspect of the program as well.

All of these sealift programs will enhance the deployability of the RDF. Equipment prestocked on ships at Diego Garcia could be moved by sea to the Persian Gulf within five days of an order to embark, while RDF units could be airlifted to their destinations. The SL-7s could move an entire mechanized division from the east coast of the United States to the Indian Ocean within two weeks. Nevertheless, like the CX cargo plane, this program assumes the unopposed disembarkation of forces and equipment at their ports of destination. Such an operation might not be feasible, however, should the United States have to conduct a unilateral operation or face local opposition when attempting to land at ports earmarked for unloading prestocked equipment from the T-AKX ships.

Augmenting Airlift: The CX Program

To enhance U.S. strategic and tactical airlift capabilities, the Air Force has proposed acquisition of a new transport plane, the CX. Although the CX could support the airlift of troops and equipment anywhere in the world, it has been closely linked with DoD's package of force enhancements to support the RDF. The Air Force proposal calls for a plane with a maximum payload of about 65 tons, making it smaller than the C-5 (with a maximum payload of 120 tons) and larger than the C-141 (with a maximum payload of 45 tons). 8/ The CX will thus have the ability to carry "outsize" cargo (that is, cargo that is too large for transport by aircraft other than the C-5). The Air Force has also specified that the CX should have the ability to take off and land on short, poorly prepared airfields. It would thus become the first U.S. transport aircraft for use within a combat theater

---

8/ It should be noted that these payloads are objective maximums; they will diminish with distance and with the specific densities of cargoes placed aboard the aircraft. The C-5 payload noted above is for the rewinged version of that aircraft; the C-141 payload is for the "B" model with an extended fuselage, popularly termed the "stretched" C-141.

(termed "tactical" airlift) with an ability to move outsize cargo such as the XM-1 tank and the XM-2 and XM-3 Fighting Vehicle System. (Current tactical aircraft, including the C-130, cannot lift outsize cargo.)

The Air Force has estimated that the cost of a CX program to procure between 130 and 200 aircraft would be approximately $10 billion. Table 15 shows the estimated added costs over the next five years of completing the Carter Administration's proposed mobility enhancement program by beginning procurement of the CX aircraft.

TABLE 15. REPORTED COSTS OF THE AIR FORCE'S PROPOSED CX PROGRAM, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total
CX Costs	0.3	0.4	1.5	1.8	1.6	5.6

SOURCE: "Cuts in Budget Disrupt Military Planning," Aviation Week and Space Technology (January 12, 1981), pp. 18-19.

While supporting in principle the requirement for additional transport aircraft, the Congress has been skeptical of the CX program, and of the assumptions that underlie it. Both the Armed Services and Appropriations Committees questioned whether the Air Force had adequately evaluated the need for a new cargo aircraft in the context of other potentially available airlift and sealift assets and in light of worldwide contingency demands for mobility forces. Accordingly, the Congress reduced to $35 million DoD's fiscal year 1981 request of $81 million for initial CX development, and limited current efforts to the study of airlift requirements. Because of this recent Congressional action, the CX aircraft was deleted from the CBO baseline. It is also not included in Table 16 at the end of this chapter.

The CX aircraft would not greatly speed deployment of armored forces because of the great weight and volume of their equipment

and supplies. CBO has estimated, for example, that even the addition of 100 C-5 type aircraft would only reduce the time needed to transport a typical mechanized division to the Persian Gulf from 22 days to about 14 days. 9/ Nor would the CX avoid the problems of vulnerability during a landing against opposition. But it would improve the United States' ability to move materiel to two theaters simultaneously--if, for example, the United States wants to hold existing mobility aircraft in reserve in the event of a European war.

An Alternative: Acquiring Additional Amphibious Lift

One way to enhance the RDF's ability to deploy quickly to the Middle East and to land its forces even in the face of local opposition would be to employ amphibious forces for initial seizure of ports and airfields. (Amphibious forces are structured for sea-based landings, even in the face of opposition.) Other RDF units could then deploy to the Middle East and arrive at facilities protected by U.S. amphibious forces.

Current levels of amphibious lift could support deployment of a small, light-armored Marine Amphibious Brigade (8,000 to 12,000 troops) in the Indian Ocean. The brigade would supplement the 7th Marine Amphibious Brigade, whose equipment is being stored at Diego Garcia. The at-sea brigade would have sufficient firepower to seize landing sites that could receive sealifted supplies, including maritime prepositioning ships with the 7th Marine Amphibious Brigade's equipment. This sealift, plus airlifted supplies, could build a force of up to 60,000 troops within two weeks. 10/

9/ Congressional Budget Office, U.S. Airlift Forces: Enhancement Alternatives for NATO and Non-Nato Contingencies, p. 57. Both estimates assume C-130 augmentation of strategic airlift forces.

10/ Current estimates point to the arrival of 49,000 troops within 16 days, once all RDF programs are implemented. (See Congressional Budget Office, U.S. Ground Forces: Design and Cost Alternatives for NATO and Non-NATO Contingencies, p. 47.) The additional Marine brigade could bring the total force to 60,000 troops.

Current Marine amphibious lift assets can support just over one division, however. (Each division is composed of three brigades.) This limited lift is divided between support of two fleets in different oceans, and must support forward at-sea deployments of lightly armored Marine Amphibious Units (1,800 troops) in the Mediterranean Sea and in the Indian and Pacific Oceans. Therefore, a brigade could deploy on a full-time basis to the Indian Ocean only if all other deployments were severely restricted.

To augment Marine amphibious lift capability would require the initiation of several major Marine amphibious ship construction programs, particularly for new dock landing ships (LSD-41), which are designed to carry high-speed Marine air-cushioned landing craft, for the landing craft themselves, and for general purpose amphibious ships (LPH) that could carry new Marine light armor and aircraft. Such a program would extend well beyond the current five-year plan. The cost of procuring amphibious shipping in fiscal years 1982-1986 as part of this program would amount to $2.0 billion. This compares to $5.6 billion for the CX airlift program over this period.

RECAPITULATION: THE COST AND COMPOSITION OF THE RDF WILL DEPEND ON U.S. OBJECTIVES

The Rapid Deployment Force currently is assigned to counter any threat to U.S. interests in the Persian Gulf, including Soviet operations. Most of the costs of the RDF, as currently programmed by the Department of Defense, will be to pay and operate forces already in the U.S. force structure. Only about $2.7 billion will be spent for new programs, including research and development on and initial procurement of assets to improve mobility, as well as for military construction.

The final bill for the RDF could be substantially higher over the next five years. It might be necessary to increase the firepower and combat support of U.S. troops, particularly if the RDF is to counter Soviet operations. These near-term programs could add $7.7 billion to baseline costs. Added funds could also be needed to carry out the Carter Administration's proposed longer-term mobility program, or for alternative approaches that emphasize the ability to land forces against local opposition. Table 16 indicates that costs over the next five years could range as high as $9.7 billion above the baseline, depending upon the alternatives pursued.

The high costs of the RDF emphasize again the importance of the allied contribution. As the previous chapter indicated, the allies may have to bear an increasing share of the costs of NATO force improvements in order to enable the United States to free resources to bolster its non-NATO capabilities.

TABLE 16. INCREASED COSTS ABOVE THE BASELINE OF GROUND FORCE AND LIFT PACKAGES FOR THE RAPID DEPLOYMENT FORCE, FISCAL YEARS 1982-1986 (In millions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total
Near-Term Improvements						
Procurement						
265 foreign-built light armored vehicles	55	55	0	0	0	110
U.S.-design light armored vehicles	0	0	28	113	113	254
Manpower						
Add 68,000 support troops	1,207	1,565	1,217	1,586	1,707	7,282
Research and Development						
Accelerate light armored vehicles	16	28	8	0	0	52
Longer-Term Improvements						
Procurement						
LPH a/	0	720	570	0	0	1,290
LSD-41 a/	0	360	0	360	0	720
Total	1,278	2,728	1,823	2,059	1,820	9,708

a/ These programs are also noted in the shipbuilding program outlined in Chapter IV.

CHAPTER VI. ACTIVE-DUTY MILITARY MANPOWER

INTRODUCTION

Previous chapters have examined the equipment needed under alternative defense strategies. Equipment alone cannot guarantee defense capability, however; the military forces must also be able to attract and retain adequate numbers of personnel with the appropriate backgrounds and skills. Today, U.S. military forces comprise 2.1 million active-duty personnel, 1 million civilians, and 0.8 million part-time reservists. Together, the pay, allowances, and benefits for these personnel will consume about $82 billion, or about half of all fiscal year 1981 defense outlays.

In recent years, the Congress has expressed considerable concern about the state of U.S. military manpower, especially active-duty enlisted personnel. Of particular concern have been the services' ability to recruit sufficient numbers of personnel, particularly high school graduates, and to retain enough experienced personnel to carry out a variety of technical tasks and leadership roles.

In response to these concerns, the Congress enacted numerous changes in pay and benefits for active-duty military personnel that became effective in fiscal year 1981. At the same time, it required that the services raise their enlisted recruit quality by accepting a smaller proportion of persons with low scores on the services' entrance examinations. The Congress also indicated agreement with the services' desires to improve the retention of enlisted personnel and hence the proportion of career personnel.

These Congressional actions raise two key issues for the fiscal year 1982 budget and beyond:

- Will the pay increases enacted by the Congress be sufficient to attract enough recruits of adequate quality and to retain enough career personnel? Or will additional increases be required?

- How will the answers to these questions change if the Congress decides to increase the size of the armed services substantially?

72-199 O - 81 - 8

The initial sections of this chapter address these broad questions in order to illustrate overall trends. The Congress actually votes on more detailed questions, however, which the chapter will also address. These include:

- What should be the size of the military pay raise in fiscal year 1982?
- What changes, if any, should the Congress make in the level or number of enlistment or reenlistment bonuses, or in military education benefits?

Active-duty compensation issues will not, of course, be the only manpower issues before the Congress. Numerous other active-duty, civilian, and reserve manpower issues could require Congressional action, but they are beyond the scope of this study. Also, unlike earlier chapters in this report, this chapter does not attempt to distinguish between near-term and longer-run issues, since almost all manpower decisions could affect the size and quality of the armed forces both in the near term and in later years.

PAY CHANGES FOR FISCAL YEAR 1981

Summary of Changes

The 96th Congress made numerous changes in military pay that became effective in fiscal year 1981. 1/ Together, the changes added about $2.3 billion to the pay costs requested in the original version of the President's fiscal year 1981 budget. Almost half the increase occurred because the Congress set the military pay raise at 11.7 percent, rather than the 7.4 percent increase called for in the original budget for fiscal year 1981. A new variable housing allowance, which increased allowances in areas with relatively high housing costs, accounted for another

---

1/ The major compensation measures (and their public law numbers) were: the fiscal year 1981 defense authorization bill (P.L. 96-342); the Nunn-Warner legislation (P.L. 96-343); and the Military Pay and Allowances Benefit Act (P.L. 96-579).

quarter of the added costs. Numerous other provisions made up the balance of the $2.3 billion. Many of the pay increases were targeted at career personnel, but the new, higher scales will also improve recruiting.

Effects on Recruiting

Probable Trends. The military services must be able to attract adequate numbers of recruits, with appropriate skills and backgrounds, to maintain force size and readiness. Problems in meeting recruit needs have loomed large in the debate over the viability of the All-Volunteer Force. One key measure of recruiting success is the ability of the services to meet their numerical recruiting goals for enlisted personnel while maintaining the desired percentage of male recruits with high school diplomas. 2/ Recruits with high school diplomas not only may be more capable in some ways, but also are more likely than nongraduates to complete their first term of enlistment. Also, while the services can generally recruit all the nongraduates they want, male graduate recruits are in short supply.

Table 17 suggests likely recruiting trends through fiscal year 1986 by estimating the percentage of male recruits in each service with high school diplomas, assuming that the services meet their overall numerical goals. The table compares these estimates with the percentage of male high school graduate recruits in each of the services in recent years. The table assumes that the 1981 relationship between military and private-sector pay is maintained and makes other important assumptions discussed below.

2/ This report concentrates on enlisted personnel, since problems with officers are far less severe. "Recruits" in this report refer to enlisted recruits without prior military service. Numbers of recruits with prior service have generally been determined more by policy than by supply considerations. Numbers of female recruits are also set largely by policy. This study assumes that numbers of female and prior-service recruits would remain roughly at their current levels. Finally, "high school graduates" in this report always refer to diploma graduates, since those who achieve graduate status by taking an equivalency examination may differ from high school graduates in their likelihood of remaining in the military.

TABLE 17. ESTIMATED PERCENTAGES OF MALE, NON-PRIOR-SERVICE RECRUITS WITH HIGH SCHOOL DIPLOMAS, BY SERVICE, FISCAL YEARS 1982-1986

Service	1982	1983	1984	1985	1986	Average 1978-1980	Fiscal Year 1981 Target
Army	59	53	54	53	52	59	65
Navy	71	70	69	67	67	74	a/
Air Force	81	75	72	66	71	83	a/
Marine Corps	75	74	71	71	71	75	a/
All Services	69	65	65	62	63	70	a/

a/ No target was set by the Congress for fiscal year 1981.

In 1982, all four services are likely to approach or meet the average percentages of graduates achieved over the last three years (see Table 17). The Army, however, probably will not reach the target set by the Congress for fiscal year 1981 requiring that at least 65 percent of recruits be high school graduates. Moreover, the percentages are likely to decline in all the services over the next five years. By 1986, if the current relationship between military and private-sector pay is continued, all four services would be substantially below the percentages of high school graduates recruited in recent years. The services could, of course, accept fewer recruits in order to increase the percentages holding high school diplomas. Under this approach, however, the services would fall short of their desired numerical goals for all recruits, which could degrade overall readiness.

Reasons for Trends. There are several reasons for the projected decline in the percentages of male recruits with high school diplomas. One is the test-score objectives set by the

Congress. Other reasons include increases in service personnel levels and the expected decline in the youth population during the 1980s.

Last year, the Congress placed significant limits on the numbers of persons who can be recruited after scoring in the lowest acceptable category on the entrance examination given to all enlistees. 3/ In the absence of the Congressional constraints, the services could increase the percentage of recruits holding high school diplomas by substituting low-scoring graduates (generally not in such short supply) for nongraduates with high test scores. Because of the importance of the test-score objectives and the objectives for recruiting high school graduates, the desirability of these policies is discussed later in the chapter.

3/ Based on the results of a written examination, recruits are classified in Category I (those scoring above the 92nd percentile), Category II (65th to 92nd percentiles), Category III (31st to 64th percentiles), Category IV (10th to 30th percentiles, or 20 percent of the reference population), or Category V (below the 10th percentile). Current law and policy prohibit enlistment of Category V personnel. The Congress has further stipulated that in 1982 no more than 25 percent of recruits in each service can score in Category IV; no more than 20 percent in each service can score in Category IV in 1983 and beyond. These objectives were prompted in part by an earlier error in norming the entrance examination. This error meant that in fiscal year 1979 about 46 percent of Army recruits were in Category IV; the incorrect norming had implied that only about 9 percent were in that category. The estimates in Table 17 reflect tentative results of the renorming; final results are not yet available. The estimates could also be heavily influenced by recruiting policies adopted by the services in the future. The estimates assume, for example, that the Air Force and Navy will not try to improve upon their test-score distributions in fiscal year 1979 (after renorming). Estimates also assume that none of the services, and particularly the Air Force and Navy, make extraordinary efforts to increase the fraction of high school diploma graduates entering their service. A decision by the Air Force and Navy to seek more high-quality recruits could seriously hamper Army recruiting.

Table 17 also assumes that pay increases enacted in fiscal year 1981 are maintained but that the ratio between military and private-sector pay is not increased. Service "end strengths" (that is, number of personnel at the end of a year) are assumed to increase by a total of 2 percent over the next five years, to man the baseline forces discussed in previous chapters. The total demands for recruits are based on CBO estimates that reflect these assumptions.

The estimates in Table 17 are influenced by more than pay and personnel policies, however. Particularly in the later years, the expected decline in the youth population will exacerbate recruiting shortfalls. Between 1981 and 1986, the number of males aged 18 to 21, who make up the prime enlisted recruiting market, will decline by about 13 percent because of the low birth rates in the 1960s. The shortages in Table 17 reflect this tightening of the recruiting market, as well as anticipated changes in other influences, such as unemployment. 4/

Effects on Retention

Success in meeting recruiting targets is heavily influenced by retention of careerists, since persons who reenlist lower the demand for new recruits. In addition, retaining career personnel is important because experienced personnel are needed to man increasingly complex military equipment. Table 18 estimates the numbers of enlisted career personnel in each of the services over the next five years and compares those estimates to current service objectives. 5/ (Career personnel are defined as those with more than four years of service.) CBO's estimates suggest that career personnel in each service will increase over the next five years, due in part to the pay raises enacted for fiscal year 1981. Moreover, the estimates suggest that every service, except

---

4/ Recruiting improves in periods of high youth unemployment. These estimates assume an overall unemployment rate of 7.6 percent in 1982, which translates into an estimated youth unemployment rate of 18.3 percent. Youth unemployment rates beyond 1982 average 17.3 percent.

5/ The objectives could be revised, as has been the case in recent years. Air Force objectives stood at 202,000 a year ago, while Army objectives were 240,000.

TABLE 18. PROJECTED END STRENGTHS OF CAREER ENLISTED PERSONNEL, a/ BY SERVICE, FISCAL YEARS 1982-1986

Service	1982	1983	1984	1985	1986	Current Objective
Army	287	294	307	311	317	281
Navy	198	201	205	210	215	218
Air Force	220	217	220	224	226	210
Marine Corps	53	55	59	60	62	50
Total	758	767	791	805	820	759

a/ End strength denotes the number of personnel at the end of a fiscal year.

the Navy, will meet its objective for careerists by 1982. The Navy will fall short of its objective in all projected years, though by only a small number in 1986. 6/

These projections are for all enlisted careerists, regardless of their skill area. Some services may still have shortages in specific skills, coupled with surpluses of personnel in others. To the extent that compensation cannot be readjusted from surplus to shortage areas, added funds may be needed to correct these skill imbalances. Such increases are discussed below.

6/ The estimates in Table 18 assume the same maintenance of pay relationships with the private sector and the same small increases in numbers of personnel that underlie the recruiting projections. In addition, the estimates assume no change in policies, such as standards for reenlistment eligibility and numbers of persons with prior military service who join and immediately enter the career force. Finally, the estimates in Table 18 are based on percentages of those who remained in the military in 1979, with adjustments for pay increases but not for unemployment. Percentages of those staying in the military in 1980 are higher than in 1979. To the extent that this increase is caused by factors other than higher unemployment in 1980, the estimates in Table 18 are conservative.

Furthermore, although the estimates in Table 18 suggest overall improvements in career manning, the trends among junior enlisted careerists (with 5 to 12 years of service) and senior careerists (with 12 to 30 years' service) are important. Since the mid-1970s, a significant shift toward a more junior career force has occurred, particularly in the Navy and Air Force. This may have heightened concern over career manning. CBO estimates that further shifts toward a junior career force will not occur over the next five years; neither, however, will there be a return to the relatively senior career force levels of the mid-1970s.

PAY RAISES NEEDED TO MAINTAIN COMPARABILITY WITH PRIVATE-SECTOR PAY

Both the recruiting and retention estimates discussed above assume that future raises will match those for workers in private-sector industries competing with the military for personnel. Thus, the required raises probably will vary among officers and enlisted personnel and among occupational groups. Indeed, the Department of Defense is required to report to the Congress by April 1, 1981, on the appropriateness of the current pay raise mechanism, which ties military pay raises to those given to federal white-collar workers. 7/

While CBO cannot predict the exact level of required raises, anticipated pay raises for workers in manufacturing industries may provide a rough guide, particularly for enlisted personnel. CBO estimates that pay raises for nonfarm production workers in the private sector will be 9.1 percent in 1982 and will average 9.9 percent a year from 1983 to 1986. These civilian raises suggest a standard for evaluating increases proposed in the President's fiscal year 1982 budget. Such an evaluation is particularly important because past limits on military pay raises, coupled with raises based on white-collar experience that may not be appropriate for all the military, contributed to the

---

7/ Authorizing Appropriations for Fiscal Year 1981 for Military Procurement, Research and Development, Active Duty, Selected Reserve, and Civilian Personnel Strengths, Civil Defense, and for Other Purposes, S. Rept. 826, 96:2 (June 1980), p. 121.

recruiting and retention problems experienced in fiscal years 1979 and 1980. 8/

ALTERNATIVES TO MEET RECRUITING GOALS

Even if military pay raises keep pace with pay increases in the private sector, the projections in an earlier section suggested that recruiting trends--as measured by the percentage of male recruits with high school diplomas--are declining. On the other hand, retention seems to be improving, due in part to the substantial 1981 pay increases aimed mainly at careerists. This suggests that recruiting may be the key problem facing the Congress in the next few years. Following a discussion of the validity of current quality constraints, this section addresses several alternatives that could improve recruiting: further pay raises, enlistment bonuses, and education benefits. All these alternatives assume continuation of the All-Volunteer Force. 9/

Validity of Quality Measures

The test-score objectives mandated by the Congress, coupled with the emphasis on recruiting high school graduates, have contributed to current recruiting problems. Thus, these measures of recruit quality deserve further scrutiny. Unfortunately, there is only fragmentary evidence on how formal education and test scores predict one's ability to perform military tasks effectively. Recruits holding high school diplomas are, however, about twice as likely to complete their first term of service as those without degrees, so this requirement may improve the stability and readiness of the armed forces. In addition, a recent study suggests that those scoring higher on entrance tests are also more likely to pass the military Skill Qualification Tests, which measure ability to perform common military

---

8/ Congressional Budget Office, Costs of Manning the Active-Duty Military (May 1980), p. 5.

9/ For a brief discussion of the pros and cons of continuing the All-Volunteer Force, see Ibid., pp. 9-11.

jobs. 10/ Finally, the recruiting constraints imposed by test scores may be desirable to ensure that the services--and particularly the Army--are to some degree representative of the U.S. population.

Thus, while the relationship between success in the military and measures such as entrance examination test scores and high school diplomas has not been fully established, these measures remain the best that are currently available. Also, the test-score objectives are now embodied in public law. Therefore, the remainder of this section estimates the costs of maintaining recruit quality, as measured by diplomas and test scores.

Pay Raises or Bonuses

Meeting recruiting goals in the face of estimated declining trends will require additional compensation. Table 19 estimates these added costs, which depend on the stringency of recruiting goals and the nature of the pay increases. The top part of Table 19 shows added costs assuming that the services meet their numerical recruiting goals while (1) complying with the Congressionally mandated test score objectives and (2) keeping the percentages of male recruits holding high school diplomas at levels equal to the average over the last three years (see Table 17). The lower part of the table makes the same assumptions, except that the Army is assumed to meet the more demanding 65 percent target for high school graduates set by the Congress for fiscal year 1981.

Recruiting goals could be met through across-the-board pay raises for all military personnel (officers and enlisted personnel on active and reserve duty) that go beyond those needed to keep pace with the private sector. Added costs would then range from zero to $3.0 billion in fiscal year 1982 and would total between $9.3 billion and $21.6 billion over the five-year period, depending on the stringency of quality goals in the Army (see Table 19). The required pay raises, above those needed to keep

---

10/ U.S. Department of Defense, Implementation of New Armed Services Vocational Aptitude Battery and Actions to Improve the Enlistment Standards Process, A Report to the House and Senate Committees on Armed Services (December 1980), p. 11.

TABLE 19. INCREASED COSTS ABOVE THE BASELINE OF ALTERNATIVE PROGRAMS TO MEET OBJECTIVES FOR RECRUITING AND CAREER MANNING, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

Type of Increase	1982	1983	1984	1985	1986	Total 1982-1986
	High School Graduates as in Last Three Years					
Across-the-Board Pay Increase	0.0	2.3	2.3	2.3	2.4	9.3
Targeted Bonuses						
Enlistment	0.1	0.6	0.6	1.0	0.8	3.1
Reenlistment	0.1	0.1	0.1	0.1	0.1	0.5
Total Bonuses	0.2	0.7	0.7	1.1	0.9	3.6
	As Above Except 65 Percent Target for Army					
Across-the-Board Pay Increase	3.0	4.6	4.6	4.7	4.7	21.6
Targeted Bonuses						
Enlistment	0.4	1.0	1.0	1.3	1.2	4.9
Reenlistment	0.1	0.1	0.1	0.1	0.1	0.5
Total Bonuses	0.5	1.1	1.1	1.4	1.3	5.4

pace with raises in the private sector, would range from zero to as much as 9 percent in fiscal year 1982; the cumulative raise by 1986 would total from 7 to 14 percent. 11/ The raises are similar

11/ Actual military pay raises would equal the real raises noted here plus increases to keep pace with private-sector pay. Given CBO estimates of pay raises needed to keep pace, actual military pay raises under this option would range from 9 to 19 percent in 1982 and would total 70 to 81 percent over the next five years.

in form to legislation proposed in the 96th Congress (H.R. 7441 and S. 2629), though their size and timing would differ. Across-the-board increases would meet recruiting goals both by increasing the willingness of recruits to enlist and by improving retention of career personnel, which would reduce recruit demand.

Recruiting goals could be met less expensively if pay increases beyond those necessary to keep pace with private-sector pay were provided through increased enlistment bonuses. Enlistment bonuses provide cash payments to enlistees entering skill areas for which it is difficult to attract recruits. Meeting recruiting goals with added bonuses would cost between $0.1 billion and $0.4 billion in 1982 and between $3.1 billion and $4.9 billion over the five-year period 1982-1986; the range again will depend on the Army's target for high school graduates. 12/ (These estimates also assume increases in reenlistment bonuses, which are discussed below.) By 1986, the lower level of increases suggested in Table 19 would mean that the real level of enlistment bonuses would be more than 35 times higher than the level in 1981. The estimates in Table 19 are based on aggregate techniques that do not produce a detailed list of enlistment bonuses by service and skill, but most of the increases would probably go to recruits in the Army and Marine Corps, particularly those in the combat arms.

The large differences in costs between across-the-board pay raises and bonuses suggest the importance of the method of increasing pay. The differences could be narrowed if the Congress expanded, and the services used, authority to allocate overall pay raises differentially among pay grades. Under such a scheme, pay raises for first-term personnel and for some career personnel could be larger, while raises for other groups, such as officers, might be smaller. In 1980, the Congress granted the President permanent authority to allocate up to 25 percent of the raise differentially among those with differing pay grades and years of service, except that the allocation procedure cannot be used to increase pay raises for personnel with four or less years of service above the overall raises in basic pay given to civilian employees. If the pay raise allocation scheme were to be used differentially to aid recruiting, the Congress would have to eliminate this restriction.

12/ Costs assume that bonuses are paid to all male and female recruits who are high school diploma graduates and who score in Category III or above on the entrance test.

Education Benefits

Rather than enacting across-the-board increases or higher enlistment bonuses, the Congress might choose to improve recruiting by increasing military education benefits. 13/ Improved education benefits have received wide support. They have been advocated by the Chief of Staff of the Army, and during the last Congressional session about 10 different plans were introduced. Only a limited test of various proposals was actually enacted, however. Improved military education benefits could help recruiting, particularly of high school graduates with high test scores, since they might be the most likely to want to continue their educations. Education benefits might also enhance the image of the military as a desirable place to serve before continuing in school.

On the other hand, more generous education benefits might be relatively ineffective as a recruiting incentive. Youths today have numerous federal and state student aid programs available to them that do not require military service. Also, the desire to continue in school may be less strong among those who enlist in the combat arms. For these reasons, even a generous package of military education benefits may not significantly aid recruiting, particularly for skill areas like the combat arms in which recruiting shortages are most severe. In addition, education benefits are delayed for several years until a person completes military service. Since young persons generally have a strong preference for receiving benefits now rather than later, the education benefits needed to meet recruiting goals might have to be more generous--and hence more expensive--than the enlistment bonuses needed to accomplish the same goals.

Resolving these many issues is beyond the scope of this overview. 14/ Nonetheless, one point seems clear. The costs of meeting recruiting goals with education benefits will be

---

13/ Current military education benefits are less generous than those under the Vietnam-era G.I. Bill, which was terminated for new recruits in 1977.

14/ CBO is currently analyzing military education incentives at the request of the Military Personnel Subcommittee of the House Armed Services Committee. The final report of this analysis should be available in the spring of 1981.

substantially higher if benefits are made available to all new enlistees, as was the case under the old G.I. Bill, rather than being targeted at those groups of recruits in short supply. Thus, in considering education benefits, the Congress faces a choice between targeted benefits and higher costs that is similar to the one discussed above with regard to enlistment bonuses and across-the-board pay raises.

ALTERNATIVES TO IMPROVE RETENTION OF CAREER PERSONNEL

Even if pay or benefits are increased to ensure adequate numbers and quality of recruits, the services must also maintain adequate numbers of career personnel. Preceding sections noted that pay raises approved last year--many of which were aimed at careerists--coupled with other factors, should increase the numbers of careerists serving in each of the services over the next five years. Moreover, CBO's projections suggest that all the services, except the Navy, will meet or exceed their objectives for careerists by 1982 and that the Navy will come close by 1986.

Some important career manning issues still remain, however. The services may suffer a shortfall of career personnel in some technical skill areas, for which pay may have to be increased. Also, the services may want to expand the size of their career force in anticipation of future force level increases, which some of the options in previous chapters envisioned. That expansion might have to begin now, given that a career force takes many years to develop. Even in the absence of force level increases, however, more careerists may be needed. In 1982, careerists will make up about 42 percent of the enlisted force, a percentage similar to the level that prevailed over the last decade. Yet new, higher-technology equipment may demand a higher percentage of careerists. Finally, even if the services do not want to expand their career forces, the expansion of defense production suggested by options in previous chapters could improve the civilian employment opportunities of some careerists with technical skills, thereby exacerbating retention problems.

For all these reasons, the military services may want to consider further compensation increases for their career personnel. One approach would be to increase reenlistment bonuses. The Congress could, for example, enact a $100 million increase in reenlistment bonuses for 1982 and maintain the resulting real level in 1983 and beyond. This would represent

an increase of about 25 percent over the 1981 reenlistment bonus level, a percentage increase similar to the one approved in 1981. 15/

If spread broadly among skill areas, such an increase would result in a service-wide career force of about 829,000 by 1986, or 9,000 (1 percent) above numbers assuming continuation of 1981 bonus levels. (The increase would also reduce requirements for new recruits by a total of 14,000 over the next five years, given end strengths in the baseline. These reductions were considered in estimating enlistment bonuses.)

If the increase in reenlistment bonuses was targeted at specific skills rather than spread more broadly, it could improve retention in high-technology skills. Or it could allow the services to target more money toward those military specialties with manpower shortages, without having to reduce the current reenlistment bonuses for other groups.

MANNING A LARGER MILITARY

The preceding analyses assumed that end strengths would increase by only the roughly 2 percent required to man the baseline forces discussed in previous chapters. But those chapters also discussed many alternatives that could require larger force increases. Alternatives presented in Chapters IV and V, for example, envisaged the bolstering of U.S. capabilities by the addition of five armored divisions plus increases in support troops. Such a step would add about 32,000 persons a year to the Army's end strength in each year between 1982 and 1986. This alternative illustrates well the manpower effects of a decision to expand U.S. forces substantially.

The additional personnel, coupled with high recruit quality goals, would drive up pay costs substantially. Increases in costs above those needed at 1981 pay rates could amount to $410 million in 1982, and to a total of $6.3 billion in the period 1982-1986, if recruits were attracted with enlistment

---

15/ Cost estimates assume that the added bonuses do not result in more personnel at senior pay grades. If the bonuses resulted in a richer pay-grade mix, costs could be higher.

bonuses. These costs were included in the estimates presented in Chapters IV and V but are broken down here for emphasis. The added costs could be many times higher if, instead of targeted bonuses, the Congress chose across-the-board pay raises or even a combination of pay raises and bonuses. The added costs could also be much greater depending on the stringency of recruit quality goals set by the Congress and the services. 16/

Moreover, while these estimates are calculated using the best available information, they should be regarded as much more uncertain than those in preceding sections of this chapter. An expansion of the Army of the magnitude discussed here requires estimating the costs of recruiting a force larger than any maintained in the all-volunteer era. If the relationships used in estimating costs of this expansion are substantially incorrect, and the estimates prove much too low, then the costs of such a larger force could prompt the Congress to consider a return to some type of peacetime conscription.

A decision to expand the Army substantially and quickly would have the most dramatic effects on costs of military manpower. But other options discussed in previous chapters would also eventually add to the size of the military services. In many cases, the long lead times required for procuring equipment mean that the increases would not take place until beyond 1986. As the above numbers suggest, however, evaluation of the long-run manpower costs of these options using 1981 pay rates could substantially understate the probable added costs.

RECAPITULATION: RECRUITING PROBLEMS MAY BE MOST PRESSING

The analysis in this chapter suggests that the pay increases enacted by the Congress for fiscal year 1981 could result in

---

16/ Added recruiting costs in this section assume that the test-score objectives set by the Congress are met. Costs also assume that the percentage of Army male recruits holding high school diplomas equals 59 percent, the average over the last three years. (Costs for recruiting included in Chapters IV and V were estimated for an earlier study and used a target of 55 percent.) Costs would be higher if the Army had to meet the 65 percent target set by the Congress for fiscal year 1981.

important improvements in both recruiting and career manning. Indeed, the pay increases appear likely to reverse adverse retention patterns that CBO forecast last year. 17/ Thus, the most important problem that the Congress may face will be the declining recruiting trends that could occur, particularly if the size of the overall force structure were increased.

This chapter has outlined some alternative approaches to meeting these problems, concentrating on meeting them through added bonuses and education incentives or through the more expensive mechanism of across-the-board pay raises. Pay, of course, is not the only tool for meeting manpower requirements. Changes in the male-female mix of recruits, numbers of recruits with prior military service, training policy, recruiting resources and techniques, and the many intangibles that affect morale have important influences, as do many other factors. Nonetheless, compensation is a vital factor which the Congress controls.

As it assesses military compensation, the Congress will probably not consider the alternatives in this chapter as a package. It will, however, vote on initiatives pointing toward one or another of the approaches discussed here. Among those initiatives are:

- The annual review of the size of the military pay raise, plus a possible decision on an additional pay raise in fiscal year 1981. The discussion above noted the need for pay raises to keep pace with private-sector wages if recruiting and retention projections in Tables 17 and 18 are to be realized.

- The annual review of the Administration's proposals for changes in enlistment and reenlistment bonuses. Discussion above noted that, given pay raises that keep pace with those in the private sector, bonuses are probably a more cost-effective way to meet manpower goals than further across-the-board pay raises.

- Consideration of improvements in military education incentives. The degree of targeting in any such benefits would influence their costs and effects on recruiting.

17/ Congressional Budget Office, Costs of Manning the Active-Duty Military.

72-199 O - 81 - 9

- Consideration of changes in military retirement benefits, possibly in the context of ways to restrain the growth of federal spending. Some shifts in retirement benefits—for example, provision of benefits to those leaving the military with fewer than 20 years of service, coupled with reductions when retirees begin receiving social security—might actually improve career retention by moving more compensation "up-front." All such changes should be assessed in terms of their retention effects.

How the Congress makes these key decisions will greatly influence the cost, and hence the viability, of the All-Volunteer Force.

CHAPTER VII. CONCLUSION

The programs reviewed in this report can generally be classified according to their short-term or longer-term effects on U.S. defense capabilities (see Table 20). Summed over five years, the funding associated with them does not exceed the levels implied by 5 percent annual real growth in defense budget authority, which the Carter Administration set as its target for the next five fiscal years (see Table 21). For individual years, of course, real growth could exceed 5 percent, and programs not considered in this paper could drive real growth in defense budget authority above 5 percent on a sustained basis. Budgetary constraints imposed by the need to reduce overall government spending, however, as well as the competing demands of other, non-defense programs, could well make it difficult to achieve more than 5 percent real growth annually. Even so, the aggregation of programs summarized in Table 20 indicates the extent to which a 5 percent ceiling could support significant enhancements of U.S. defense capability.

Strategic Forces. Although the Congress has already approved a large number of programs that would enhance strategic force capability in the longer term, some believe that near-term improvements are also needed. Of the near-term strategic alternatives considered in this report, increasing B-52 peacetime day-to-day alert rates is perhaps the most likely to improve capabilities within the next five years. Other programs, such as developing a multiple protective structure basing system for Minuteman III, could well take the better part of a decade, or even longer, to complete.

Despite the large number of longer-term strategic programs already under way, some additional initiatives could still be of interest. These include acceleration of the Trident II missile program, as a hedge against unforeseen delays in the deployment of the MX ICBM. Another major area for new Congressional action is improvements to the strategic command, control, and communications (C^3) system. Strategic C^3 programs would not increase baseline budget authority significantly, but could be critical to the effective use of U.S. strategic force capability.

NATO-Related General Purpose Forces. In contrast to strategic force programs, significant increases are possible for

TABLE 20. CHANGES TO THE BASELINE: COSTS OF EXAMPLES DISCUSSED IN THIS STUDY, FISCAL YEAR 1982 AND TOTAL FOR FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

Programs	1982	Total 1982-1986
Strategic Forces		
Near-term programs		
Increase B-52 alert rates	0.1	0.8
Longer-term programs		
Accelerate Trident II development	0.8	1.4
Other programs		
Enhance strategic C^3 a/	0.7	2.2
General Purpose Forces: NATO		
Near-term programs		
Add POMCUS-related funding	0.8	2.9
Homeport a carrier in the Mediterranean	0.3	0.7
Add funding for Air Force spare parts	0.3	1.3
Longer-term programs		
Add five fully supported armored divisions	7.5	38.9
Augment shipbuilding programs, including three aircraft carriers	4.2	16.0
General Purpose Forces: Rapid Deployment Force (RDF)		
Near-term programs		
Add 68,000 support troops	1.2	7.3
Procure lightweight armored vehicles	0.1	0.4
Longer-term programs		
Procure additional amphibious shipping	0.0	2.0
Manpower		
Targeted enlistment and reenlistment bonuses	0.5	5.4
Total Near-Term	2.8	13.4
Total Longer-Term	12.5	58.3
Total Other	1.2	7.6
Total All Programs	16.5	79.3

a/ As Chapter III indicated, command, control, and communications (C^3) have both near- and longer-term applications and, hence, are listed as "other programs."

TABLE 21. CHANGES TO THE BASELINE VERSUS 5 PERCENT REAL GROWTH, FISCAL YEARS 1982-1986 (In billions of fiscal year 1982 dollars)

	1982	1983	1984	1985	1986	Total 1982-1986
CBO Baseline	196.1	202.1	206.5	206.8	199.4	1,010.9
Amount by Which Baseline Falls Short of 5 Percent Real Growth	3.4	7.4	13.4	24.1	43.1	91.4
Changes to the Baseline						
All near-term programs	2.8	3.2	2.2	2.7	2.5	13.4
All longer-term programs	12.5	13.2	14.6	8.3	9.7	58.3
Other programs	1.2	1.9	1.3	1.7	1.5	7.6
All Programs	16.5	18.3	18.1	12.7	13.7	79.3

general purpose forces, both those earmarked for operations in Europe to support NATO against an attack by the Warsaw Pact and those that would operate outside the NATO area.

The current defense baseline does include a number of new programs for theater nuclear and conventional NATO-related forces. Apart from the nuclear programs, however, many of these initiatives, most notably the POMCUS program, focus on the ability of the U.S. ground forces to reinforce NATO rapidly early in a war. These programs would add little to NATO's ability to defend all of Western Europe over the course of a sustained conflict. Additions to the baseline could include near-term programs for spare parts acquisition, to enhance the readiness of tactical air forces; homeporting arrangements in the Mediterranean, to enhance naval force readiness; and the addition of two fully supported armored divisions, as part of an alliance-wide effort to provide an elastic defense of Europe.

For the longer term, increases to the baseline could include the addition of five fully supported armored divisions as part of a NATO program to provide a steadfast defense that would cede no territory to the Warsaw Pact. Other increments to the baseline could include new construction of major warships, including three carriers, as part of a NATO program that assigned the construction of convoy escort ships to the other allies.

The effectiveness of these programs depends on allied commitments to accept their share of any force expansion. Such commitments would increase their defense spending beyond the 3 percent annual real growth level agreed upon in 1977. Without commitments of this kind, the United States would face a difficult choice between even larger NATO-related increases or a change in the relative emphasis of NATO and non-NATO requirements as the basis for defense planning.

Non-NATO General Purpose Forces. The baseline for forces operating outside the NATO area stresses funding for operating, maintaining, and manning the Rapid Deployment Force (RDF). Like the NATO baseline, the non-NATO baseline does not include force level increases. The programs in the baseline for the RDF are geared primarily to increasing operational capability for forces that might be deployed to the Persian Gulf region. Such procurement programs as are included, notably those for maritime prepositioning ships, could not be completed before the end of the decade.

Increments to the baseline could provide force level increases, however. Although such increases would depend on whom the RDF would oppose, they could, at a minimum, call for 60,000 to 70,000 additional support troops. Other increases could include additional lightweight armor to augment the RDF's firepower. A program to increase amphibious shipping levels would provide the RDF with an ability not only to respond quickly to Persian Gulf crises, but to land forces in the face of opposition. Such a situation could materialize if the United States had to operate unilaterally in a Persian Gulf contingency.

Military Manpower. Significant increases above current baseline levels are also possible for programs designed to improve the quality of active-duty military manpower. To be sure, the pay increases already enacted by the Congress, and incorporated into the baseline, will improve career manning. While some problems remain that could require increases in reenlistment bonuses, pay increases already enacted appear to have reversed adverse trends in overall career levels.

Pay increases, which were targeted on careerists, did less to improve recruiting. Moreover, any expansion in force levels would increase demands on recruiting, as will declining levels of the youth population. Furthermore, the Congress might wish to ensure that the services can meet more demanding targets for high school diploma graduates. Meeting those targets would be difficult within the constraints of Congressionally imposed limits on the number of persons who can be recruited after scoring in the lowest acceptable category on the entrance examination for enlistees. Thus, recruiting problems may be the most pressing ones facing the Congress.

Additions to the current baseline for military manpower compensation therefore focus on solving recruiting problems that are likely to arise in the 1980s. Across-the-board pay raises would involve much greater cost than cash bonuses targeted at recruiting personnel into specific skill areas, and would have a much greater impact on the cost of increased force levels, such as those discussed in this paper. The Congress could also consider increases in military education benefits as a way of improving recruiting, although their effectiveness depends on factors not analyzed in this report.

The Congress therefore confronts a series of key, interacting decisions on allocating funds for different types of forces and systems, and for compensating the personnel that will man them. How the Congress reaches those decisions will significantly influence the U.S. force posture over the next decade.

APPENDIXES

APPENDIX A. OVERVIEW OF DEFENSE EXPENDITURES, FISCAL YEARS 1964-1980

The following tables present an overview of defense expenditures in both budget authority and outlays for selected years within the period fiscal years 1964-1980. Tables A-1 through A-5 present budget authority and outlays for the major appropriations accounts--military personnel; procurement; operations and maintenance; research, development, test, and evaluation; and military construction--as allocated to each service and to defense agencies.

Tables A-6 through A-10 present budget authority and outlays for each service and the defense agencies, as allocated among the major appropriations accounts. Finally, Table A-11 presents the share of each budget allocated to the appropriations accounts. 1/

Military personnel steadily increased its share of defense budget authority until the mid-1970s. While procurement claimed the largest share of defense budget authority in the 1960s, its share declined markedly in the early 1970s. Budget authority for procurement rose sharply after 1976, however, and by 1978 it claimed a larger share of total budget authority than military personnel. Procurement has claimed the largest share of Navy budgets throughout the period under review, however, reflecting the capital-intensive nature of that service.

Since the mid-1970s, the largest share of the overall budget has been allocated to operations and maintenance (which includes the pay of civilian personnel who work for DoD). This account has also received nearly twice the funding of procurement in Army budgets throughout the period under review. It has also claimed a larger share of Navy budgets than has the military personnel account since fiscal year 1968.

1/ This table includes the share of defense budgets allocated to civil defense and family housing. Separate tables are not provided for these accounts.

Research and development has accounted for approximately 11 percent of the total defense budget since fiscal year 1968. It has tended to represent a slightly higher percentage in Air Force budgets, ranging between 12 and 14 percent since 1968.

TABLE A-1. MILITARY PERSONNEL: BUDGET AUTHORITY AND OUTLAYS, BY SERVICE, FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Service	1964	1968	1972	1974	1976	1978	1979	1980
Army a/								
Budget authority	4.46	8.43	8.95	8.84	9.61	10.48	11.06	12.07
Outlays	4.60	8.33	9.00	8.73	9.52	10.45	10.94	11.99
Navy a/								
Budget authority	2.95	4.28	5.23	5.81	6.11	6.67	7.03	7.62
Outlays	3.07	4.25	5.27	5.70	6.02	6.60	6.98	7.52
Air Force a/								
Budget authority	4.49	5.84	7.26	7.80	7.56	7.99	8.43	9.00
Outlays	4.55	5.81	7.28	7.66	7.44	7.94	8.35	9.02
Marine Corps a/								
Budget authority	0.76	1.47	1.53	1.73	1.93	2.10	2.19	2.33
Outlays	0.76	1.47	1.48	1.64	1.88	2.09	2.14	2.32

a/ Includes active and reserve forces.

72-199 O - 81 - 10

TABLE A-2. PROCUREMENT: BUDGET AUTHORITY AND OUTLAYS, BY SERVICE, FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Service	1964	1968	1972	1974	1976	1978	1979	1980
Army								
Budget authority	2.91	6.40	3.11	2.48	2.97	5.19	6.07	6.44
Outlays	2.31	5.84	0.92	2.78	1.35	3.22	4.46	5.42
Navy								
Budget authority	6.12	6.88	8.51	8.42	9.83	13.70	14.02	15.57
Outlays	5.80	7.20	6.99	6.90	7.85	8.89	11.39	12.03
Air Force								
Budget authority	6.37	9.36	6.01	5.86	7.70	9.88	10.71	12.80
Outlays	6.96	9.41	6.05	5.37	6.48	7.33	8.91	10.90
Marine Corps								
Budget authority	0.20	0.73	0.10	0.21	0.28	0.44	0.36	0.28
Outlays	0.24	0.78	0.14	0.13	0.19	0.31	0.40	0.37
Defense Agencies								
Budget authority	0.04	0.04	0.05	0.07	0.20	0.33	0.27	0.29
Outlays	0.03	0.04	0.05	0.06	0.10	0.22	0.24	0.30

TABLE A-3. OPERATIONS AND MAINTENANCE: BUDGET AUTHORITY AND OUTLAYS, BY SERVICE, FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Service	1964	1968	1972	1974	1976	1978	1979	1980
Army a/								
Budget authority	3.53	8.37	7.17	7.40	8.27	9.79	10.81	12.29
Outlays	3.63	8.17	7.55	7.04	7.93	9.62	10.36	11.89
Navy a/								
Budget authority	2.91	4.97	5.31	6.79	8.59	11.38	12.32	15.25
Outlays	2.89	4.73	5.42	6.11	8.21	10.63	11.58	14.73
Air Force a/								
Budget authority	4.56	6.16	6.82	7.69	8.71	9.84	10.82	14.15
Outlays	4.70	6.21	7.16	7.34	8.61	9.76	10.48	13.61
Marine Corps a/								
Budget authority	0.19	0.43	0.37	0.45	0.53	0.68	0.77	0.87
Outlays	0.18	0.43	0.39	0.40	0.50	0.64	0.72	1.32
Defense Agencies								
Budget authority	0.48	0.97	1.22	1.56	2.55	2.96	3.16	3.64
Outlays	0.47	0.96	1.22	1.54	2.51	2.86	3.18	3.57

a/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

TABLE A-4. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION: BUDGET AUTHORITY AND OUTLAYS, BY SERVICE, FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Service	1964	1968	1972	1974	1976	1978	1979	1980
Army								
Budget authority	1.40	1.56	1.80	1.94	1.96	2.41	2.64	2.85
Outlays	1.34	1.43	1.78	2.19	1.84	2.34	2.41	2.71
Navy								
Budget authority	1.56	1.87	2.37	2.68	3.26	4.02	4.48	4.57
Outlays	1.58	2.00	2.43	2.62	3.22	3.82	3.83	4.38
Air Force								
Budget authority	3.54	3.39	2.90	3.07	3.61	4.17	4.40	5.06
Outlays	3.72	3.80	3.21	3.24	3.34	3.63	4.08	5.02
Defense Agencies								
Budget authority	0.48	0.46	0.45	0.46	0.60	0.75	0.89	1.04
Outlays	0.38	0.51	0.47	0.50	0.51	0.69	0.81	0.98

TABLE A-5. MILITARY CONSTRUCTION: BUDGET AUTHORITY AND OUTLAYS, BY SERVICE, FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Service	1964	1968	1972	1974	1976	1978	1979	1980
Army a/								
Budget authority	0.21	0.48	0.60	0.65	0.90	0.63	0.81	0.83
Outlays	0.23	0.68	0.42	0.69	0.91	0.73	0.70	0.95
Navy a/								
Budget authority	0.20	0.52	0.36	0.63	0.81	0.49	0.78	0.60
Outlays	0.19	0.09	0.34	0.41	0.67	0.63	0.76	0.80
Air Force a/								
Budget authority	0.49	0.50	0.31	0.28	0.63	0.47	0.54	0.63
Outlays	0.55	0.49	0.33	0.29	0.41	0.54	0.61	0.70
Defense Agencies								
Budget authority	0.05	0.04	0.01	--	0.02	0.05	0.18	0.22
Outlays	0.05	0.01	0.01	0.01	0.02	0.02	—	-0.01

a/ Includes active and reserve forces.

TABLE A-6. U.S. ARMY BUDGETS FOR SELECTED FISCAL YEARS 1964-1980
(In billions of current dollars)

Program	1964	1968	1972	1974	1976	1978	1979	1980
Military Personnel a/								
Budget authority	4.46	8.43	8.95	8.84	9.61	10.48	11.06	12.07
Outlays	4.60	8.33	9.00	8.73	9.52	10.45	10.94	11.99
Operations and Maintenance b/								
Budget authority	3.53	8.37	7.17	7.40	8.27	9.79	10.81	12.29
Outlays	3.63	8.17	7.55	7.04	7.93	9.62	10.36	11.89
Procurement								
Budget authority	2.91	6.40	3.11	2.48	2.97	5.19	6.07	6.44
Outlays	2.31	5.84	0.92	2.78	1.35	3.22	4.46	5.42
Research, Development, Test, and Evaluation								
Budget authority	1.40	1.56	1.80	1.94	1.96	2.41	2.64	2.85
Outlays	1.34	1.43	1.78	2.19	1.84	2.34	2.41	2.71
Military Construction a/								
Budget authority	0.21	0.48	0.60	0.65	0.90	0.63	0.81	0.83
Outlays	0.23	0.68	0.42	0.69	0.91	0.73	0.70	0.95
Total								
Budget authority	12.51	25.24	21.31	21.30	23.71	28.50	31.39	34.48
Outlays	12.11	24.45	19.67	21.43	21.55	26.36	28.87	32.96

a/ Includes active and reserve forces.

b/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

TABLE A-7. U.S. NAVY BUDGETS FOR SELECTED FISCAL YEARS 1964-1980
(In billions of current dollars)

Program	1964	1968	1972	1974	1976	1978	1979	1980
Military Personnel a/								
Budget authority	2.95	4.28	5.23	5.81	6.11	6.67	7.03	7.62
Outlays	3.07	4.25	5.27	5.70	6.02	6.60	6.98	7.52
Operations and Maintenance b/								
Budget authority	2.91	4.97	5.31	6.79	8.59	11.38	12.32	15.25
Outlays	2.89	4.73	5.42	6.11	8.21	10.63	11.58	14.73
Procurement								
Budget authority	6.12	6.88	8.51	8.42	9.83	13.70	14.02	15.57
Outlays	5.80	7.20	6.99	6.90	7.85	8.89	11.39	12.03
Research, Development, Test, and Evaluation								
Budget authority	1.56	1.87	2.37	2.68	3.26	4.02	4.48	4.57
Outlays	1.58	2.00	2.43	2.62	3.22	3.02	3.83	4.38
Military Construction a/								
Budget authority	0.20	0.52	0.36	0.63	0.81	0.49	0.78	0.60
Outlays	0.19	0.09	0.34	0.41	0.67	0.63	0.76	0.80
Total								
Budget authority	13.74	18.52	21.78	24.33	28.60	36.26	38.63	43.61
Outlays	13.54	18.27	20.45	21.74	25.97	30.58	34.54	39.46

a/ Includes active and reserve forces.

b/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

TABLE A-8. U.S. AIR FORCE BUDGETS FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Program	1964	1968	1972	1974	1976	1978	1979	1980
Military Personnel a/								
Budget authority	4.49	5.84	7.26	7.80	7.56	7.99	8.43	9.00
Outlays	4.55	5.81	7.28	7.66	7.44	7.94	8.35	9.02
Operations and Maintenance b/								
Budget authority	4.56	6.16	6.82	7.69	8.71	9.84	10.82	14.15
Outlays	4.70	6.21	7.16	7.34	8.61	9.76	10.48	13.61
Procurement								
Budget authority	6.37	9.36	6.01	5.86	7.70	9.88	10.71	12.80
Outlays	6.96	9.41	6.05	5.37	6.48	7.33	8.91	10.90
Research, Development, Test, and Evaluation								
Budget authority	3.54	3.39	2.90	3.07	3.61	4.17	4.40	5.06
Outlays	3.72	3.80	3.21	3.24	3.34	3.63	4.08	5.02
Military Construction a/								
Budget authority	0.49	0.50	0.31	0.28	0.63	0.47	0.54	0.63
Outlays	0.55	0.49	0.33	0.29	0.41	0.54	0.61	0.70
Total								
Budget authority	19.45	25.25	23.30	24.70	28.21	30.65	33.04	41.64
Outlays	20.48	25.72	24.03	23.90	26.28	27.52	30.61	39.25

a/ Includes active and reserve forces.

b/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

TABLE A-9. U.S. MARINE CORPS BUDGETS FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

Program	1964	1968	1972	1974	1976	1978	1979	1980
Military Personnel a/								
Budget authority	0.76	1.47	1.53	1.73	1.93	2.10	2.19	2.33
Outlays	0.76	1.47	1.48	1.64	1.88	2.09	2.14	2.32
Operations and Maintenance b/								
Budget authority	0.19	0.43	0.37	0.45	0.53	0.68	0.77	0.87
Outlays	0.18	0.43	0.39	0.40	0.50	0.64	0.72	0.84
Procurement								
Budget authority	0.20	0.73	0.10	0.21	0.28	0.44	0.36	0.28
Outlays	0.24	0.78	0.14	0.13	0.19	0.31	0.40	0.37
Total								
Budget authority	1.15	2.63	2.00	2.39	2.74	3.22	3.32	3.48
Outlays	1.18	2.68	2.01	2.17	2.57	3.04	3.26	3.53

a/ Includes active and reserve forces.

b/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

TABLE A-10. U.S. DEFENSE AGENCIES BUDGETS: FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

	1964	1968	1972	1974	1976	1978	1979	1980
Operations and Maintenance								
Budget authority	0.48	0.97	1.22	1.56	2.55	2.96	3.16	3.64
Outlays	0.47	0.96	1.22	1.54	2.51	2.86	3.18	3.57
Procurement								
Budget authority	0.04	0.04	0.05	0.07	0.20	0.33	0.27	0.29
Outlays	0.03	0.04	0.05	0.06	0.10	0.22	0.24	0.30
Research, Development, Test, and Evaluation								
Budget authority	0.48	0.46	0.45	0.46	0.60	0.75	0.89	1.04
Outlays	0.38	0.51	0.47	0.50	0.51	0.69	0.81	0.98
Military Construction								
Budget authority	0.05	0.04	0.01	--	0.02	0.05	0.18	0.22
Outlays	0.05	0.01	0.01	0.01	0.02	0.02	—	-0.01
Total								
Budget authority	1.05	1.51	1.73	2.09	3.37	4.09	4.50	5.19
Outlays	0.93	1.52	1.75	2.11	3.14	3.79	4.23	4.84

TABLE A-11. BUDGETS BY APPROPRIATIONS ACCOUNT: FOR SELECTED FISCAL YEARS 1964-1980 (In billions of current dollars)

	1964	1968	1972	1974	1976	1978	1979	1980
Military Personnel a/								
Budget authority	12.66	20.02	22.97	24.18	25.21	27.24	28.71	31.02
Outlays	12.98	19.86	23.03	23.73	24.86	27.08	28.41	30.85
Procurement								
Budget authority	15.64	23.41	17.78	17.04	20.98	29.54	31.43	35.38
Outlays	15.34	23.27	14.15	15.24	15.97	19.97	25.40	29.02
Operations and Maintenance b/								
Budget authority	11.67	20.90	20.89	23.89	28.65	34.65	37.88	46.20
Outlays	11.87	20.50	21.74	22.43	27.76	33.51	36.32	45.12
Research, Development, Test, and Evaluation								
Budget authority	6.98	7.28	7.52	8.15	9.43	11.35	12.41	13.52
Outlays	7.02	7.74	7.89	8.55	8.91	10.48	11.13	13.09
Military Construction a/								
Budget authority	0.95	1.54	1.28	1.56	2.36	1.64	2.31	2.28
Outlays	1.02	1.27	1.10	1.40	2.01	1.92	2.07	2.44
Civil Defense								
Budget authority	0.11	0.09	0.08	0.08	0.09	--	--	--
Outlays	0.11	0.11	0.07	0.08	0.08	--	--	--
Family Housing								
Budget authority	0.64	0.61	0.86	1.10	1.23	1.35	1.56	1.53
Outlays	0.58	0.50	0.69	0.89	1.19	1.40	1.47	1.68
Total								
Budget authority	48.65	73.85	71.38	76.00	87.95	105.77	114.30	129.93
Outlays	48.92	73.25	68.67	72.32	80.78	94.36	104.80	122.20

a/ Includes active and reserve forces.

b/ Includes only active forces in 1964 and 1968; includes active and reserve forces from 1972 on.

APPENDIX B. DETAILS OF THE CBO BASELINE METHODOLOGY

OPERATING COSTS

To estimate the operating costs that make up a substantial portion of the CBO baseline requires detailed information on the forces that will function over the next five years. Thus, the baseline projects operating forces at the level of major type of ship, individual aircraft, and Army and Marine Corps divisions. Force levels are assumed to increase only if the Congress has funded development or procurement of systems beyond the level required to replace older units.

The baseline includes both fixed and variable operating costs for each weapon system. These costs are based on Congressional decisions for the most recent fiscal year—fiscal year 1981 in this report.

INVESTMENT COSTS

The baseline profile for purchase of new weapons systems is derived from several sources. It begins with DoD's justification material supporting the Administration's annual defense budget request and five-year plan--in this case, the request for fiscal year 1981 and the plan for fiscal years 1981-1985. 1/ Modifications of the baseline then depend on Congressional actions.

In those cases in which the Congress fully funded a DoD program request for fiscal year 1981, the baseline assumes the DoD funding profile for the remaining years of the program. This rule applies both to programs in research and development and to those in procurement, including programs that are currently in engineering or full-scale development stages and will soon enter procurement. For programs about to enter procurement, it is

---

1/ A variety of additional materials are used to extend the baseline to 1986.

assumed that the program's transition from research and development to procurement is in accordance with DoD's timetable.

In those cases in which the Congress funded programs in 1981 at different levels from those requested by DoD, the baseline alters the five-year program projected by DoD to make it consistent with Congressional actions. Such alterations can involve merely a change in one year of the five-year program, as, for example, when the Congress adds advanced funding not requested by DoD in order to accelerate planned procurement.

If the Congress deleted an entire program from the 1981 budget request, the baseline drops the program from each year of the five-year plan. An example of such action was Congressional deletion of advanced funding for a mid-sized nuclear-powered attack submarine, called the SSNX. The Congress indicated that it would not support this program. Accordingly, the baseline drops procurement of the submarine in all years.

Finally, if in 1981 the Congress funded a program not requested by the Department of Defense, the baseline includes that program in subsequent years of the five-year plan, based upon proposals put forward by the appropriate military service. For example, in the past DoD has not requested funds for developing or procuring the AV-8B vertical/short take-off and landing (V/STOL) attack aircraft. The Marine Corps, however, has indicated that it wants the plane, and Congress has provided funds for both development and advanced procurement of it. The CBO baseline, therefore, adds the AV-8B to the five-year plan, drawing upon Marine Corps estimates of funding and acquisition profiles for fiscal years 1982-1986.

LIMITATIONS OF THE BASELINE

While the information provided by DoD, the Congress, and the military services generally is sufficient for relatively precise estimates of most future budget programs and costs, the costs of all defense programs cannot be estimated with equal precision. In particular, because the CBO baseline is unclassified, it cannot directly address classified programs, such as intelligence programs, although DoD may have developed costs for such programs with great precision. Accordingly, the CBO baseline assumes that expenditures on classified programs will be held at constant real levels throughout the five-year planning period and incorporates

those costs within more highly aggregated, unclassified budget categories.

CBO adopts a similar "straight-line" approach to the costs of research and development programs whose funding profiles have not been explicitly outlined in DoD's five-year plan. Generally, these programs tend to fall into the categories of basic research, exploratory research, or management and support. As noted earlier, programs in engineering or full-scale development are usually sufficiently close to procurement to permit more specific cost estimates.

DEALING WITH UNCERTAINTIES IN DEVELOPING THE BASELINE: THE STRATEGIC BOMBER

In virtually all programs, the CBO baseline either provides estimates of program investment profiles derived from available budgetary material, or else applies a "straight-line" projection of current funding levels. Occasionally, it must employ a more judgmental approach. The strategic bomber requires such an approach because the Congress mandated spending on a new system without detailing a specific system type or program. In this case, CBO used a proxy system to reflect the program approximately in the baseline.

In fiscal year 1981, the President's budget contained no funds for a strategic bomber program to replace the aging B-52 fleet. The Congress, however, appropriated $300 million for research and development of a new strategic bomber, but did not specify a particular aircraft in the conference report accompanying the final defense appropriations bill. The reports accompanying the initial appropriations bills from the Senate and House Appropriations Committees did address several alternatives, including the B-1 bomber, possible derivatives of the B-1, and the "stretched" FB-111 bomber. The House Appropriations Committee also mentioned new designs incorporating "stealth" technology.

Neither Appropriations Committee specified the characteristics that the bomber should possess. On the other hand, the Armed Services Committees' conference report on the defense authorization bill specified that the aircraft chosen from among the various candidates should be capable of performing the missions of a conventional bomber and have a cruise-missile launch platform and a delivery system for other nuclear weapons. It also specified that the plane's development should be scheduled so that it

would have an initial operational capability (IOC) of 1987. (Neither the conference report on the appropriation bill nor the reports of the two Appropriations Committees specified an IOC, leaving open the possibility of a longer development cycle.)

Given Congressional funding of a new strategic bomber, with uncertainty as to its exact type but with a sense of its required capabilities, CBO used a proxy bomber development program, a modified B-1. This program reflects the language in the authorization conference report regarding mission capabilities. It incorporates the Air Force program for a so-called strategic weapons launcher, with estimated additional funding to provide it with a capability to penetrate enemy territory while carrying nuclear bombs. The costs of the actual bomber program adopted by DoD and the Congress obviously will be subject to considerable variation. Nevertheless, CBO's baseline estimate for that program reflects the magnitude of any undertaking to develop a strategic bomber.

GLOSSARY

GLOSSARY

A-10: New Air Force battlefield attack aircraft.

ABM: Anti-ballistic missile.

ADX: New-design destroyer tender.

AH-64: New Army attack helicopter, programmed to fire laser-guided antitank missiles.

AIRS: Advanced Inertial Reference Sphere, the guidance system for the MX missile.

ALCM: Air-launched cruise missile; a pilotless aircraft, propelled by an air-breathing engine that operates entirely within the earth's atmosphere.

ARX: New-design repair ship.

Attack DD: New-design destroyer proposed by the Navy.

AV-8B: Improved version of the AV-8A vertical/short take-off and landing attack aircraft.

B-1: A proposed new long-range bomber; the B-1 program was cancelled in 1977 after production of four development aircraft.

B-52: A long-range bomber aircraft; B-52s compose the majority of the U.S. strategic long-range bomber fleet.

C-130: A cargo aircraft used primarily for intratheater airlift.

CG-47: A 7,800-ton guided missile cruiser employed primarily for air defense.

CV: Conventionally powered aircraft carrier.

CVN: Large, nuclear-powered, multipurpose aircraft carrier.

CX: A medium-size military cargo transport aircraft currently proposed by the Air Force.

End Strength: Number of personnel at the end of a fiscal year.

F-14: Navy fighter aircraft used to achieve air superiority and for fleet air defense.

F-15: Air Force air superiority fighter.

F-16: Air Force strike fighter.

F/A-18: Fighter and attack variants of U.S. Navy and Marine Corps combat aircraft.

F-111: Air Force long-range attack aircraft.

FB-111: A medium-range strategic bomber.

FFG-7: Most recent class of guided missile frigate.

ICBM: Intercontinental ballistic missile.

IFV: Infantry fighting vehicle, a follow-on to the current standard personnel carrier; also termed XM-2.

KC-10: A new Air Force tanker aircraft.

KC-135: Air Force tanker.

LoADS: Low Altitude Defense System, a concept for an anti-ballistic missile system.

LPH: Amphibious assault ship carrying V/STOL aircraft and helicopters.

LSD-41: Amphibious dock landing ship.

LTDP: The Long-Term Defense Program; adopted by NATO in 1977 to improve military capabilities in ten areas: readiness, reinforcement, mobilization, electronic warfare, air defense, logistics, nuclear weapons, maritime posture, communications, and rationalization with arms production; under the LTDP, each NATO member pledged to increase annual real defense spending by 3 percent.

Minuteman III: The most modern U.S. land-based intercontinental ballistic missile.

MIRV: Multiple, independently targetable reentry vehicle.

Mk-4: Type of reentry vehicle carried by the Trident I missile.

MPS: Maritime prepositioning ship (formal designation T-AKX), which could hold heavy equipment for ground force units.

MX: A new land-based intercontinental ballistic missile currently under development.

Polaris: The original class of ballistic missile submarines, each of which carries 16 missiles.

POMCUS: Prepositioning of material configured to unit sets, a program to preposition sets of division equipment in Europe to speed deployment of U.S.-based forces.

Poseidon: A class of strategic submarines, each of which carries 16 ballistic missiles.

SL-7: Commercial container ship converted to fast logistics ship.

SSN-688: The most modern nuclear-powered attack submarine in the U.S. fleet.

SSX: New-design diesel-electric submarine.

T-AKX: Forward-deployed logistics ship (see MPS).

Trident I Missile: The newest submarine-launched ballistic missile with a greater range and yield than the Poseidon missile.

Trident II Missile: Proposed follow-on submarine-launched ballistic missile with projected greater yield and accuracy than the Trident I.

Trident Submarine: New large ballistic missile submarine.

V/STOL: Vertical/short take-off and landing attack aircraft.

XM-1 Tank: New Army main battle tank.

XM-2/3: New Army fighting vehicles.

○