

# CBO

## Long-Term Implications of the 2016 Future Years Defense Program



JANUARY 2016

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## Notes

Unless otherwise indicated, all years referred to in this study are federal fiscal years (which run from October 1 to September 30 and are designated by the calendar year in which they end), all costs apply to fiscal years and are expressed in fiscal year 2016 dollars of total obligational authority (TOA), and all growth rates are adjusted for inflation using the Congressional Budget Office's projection of the gross domestic product price index. TOA is a term used by the Department of Defense to measure the funding available for its programs. TOA differs from discretionary budget authority in several ways; most notably, it adjusts for the timing of rescissions and lapses of prior-year budget authority.

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

On the cover, clockwise from the top: A V-22 Osprey helicopter above the amphibious transport dock ship U.S.S. *Green Bay* (photo by U.S. Navy Mass Communication Specialist 3rd Class E. Guttierrez); the guided-missile destroyer U.S.S. *Chung-Hoon* (photo by Mass Communication Specialist 3rd Class A. T. Richard); a B-1B Lancer (photo by Staff Sergeant A. Allmon); soldiers aboard an M1 Abrams main battle tank (photo by Staff Sergeant A. Allmon).

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# Summary

In most years, the Department of Defense (DoD) produces a five-year plan, called the Future Years Defense Program (FYDP), associated with the budget that it submits to the Congress. The FYDP describes DoD's plan for its normal, peacetime activities (corresponding to what is often labeled its base budget). DoD's current plans are described in its 2016 FYDP, which covers fiscal years 2016 through 2020.

Those plans call for relatively flat budgets that average \$534 billion for 2016 through 2020. (Unless otherwise noted, all costs in this report are expressed in 2016 dollars to remove the effects of inflation.) If DoD's plans are projected for an additional 10 years, the Congressional Budget Office's analysis indicates that defense budgets would be larger, averaging \$565 billion per year from 2021 through 2030 under DoD's cost assumptions. Moreover, CBO estimates that the cost of DoD's plans would be 4 percent higher over the next 15 years under a set of policies and prices that more closely matched recent experience.

## DoD's Plans Call for No Real Growth in Budgets Through 2020

For fiscal year 2016, DoD requested appropriations totaling \$585 billion. Of that amount, \$534 billion was to fund the department's base budget, which encompasses activities such as the development and procurement of weapon systems and the day-to-day operations of the military and civilian workforce. The remaining \$51 billion of DoD's request was to pay for the costs of overseas contingency operations (OCO), mostly Operation Freedom's Sentinel in Afghanistan and Operation Inherent Resolve in Iraq and Syria.

For that year, the Consolidated Appropriations Act, 2016, provided \$580 billion in funding for DoD's base budget and OCO budget combined—slightly less than

the sum DoD requested.<sup>1</sup> Compared with the department's request, there were modest reductions in funding for day-to-day operations and modest increases in procurement. Those changes were small and will probably have little effect on DoD's plans through the FYDP period. Therefore, this report, which was largely prepared before the appropriations were enacted, focuses on DoD's plans and not the actual 2016 appropriations.

Under those plans, real (inflation-adjusted) costs for the base budget would increase to \$538 billion in 2017, DoD estimates, and decline slowly to \$527 billion in 2020 (see Summary Figure 1). That decline, coupled with CBO's projections for continued economic growth, would see DoD's costs as a percentage of gross domestic product (GDP) decrease from 2.8 percent in 2016 to 2.5 percent in 2020. Nevertheless, the average costs of the plan, \$534 billion per year for 2016 through 2020, would be greater than the funding DoD received in all but six years (1985, and 2008 through 2012) since 1980, after adjusting for inflation.

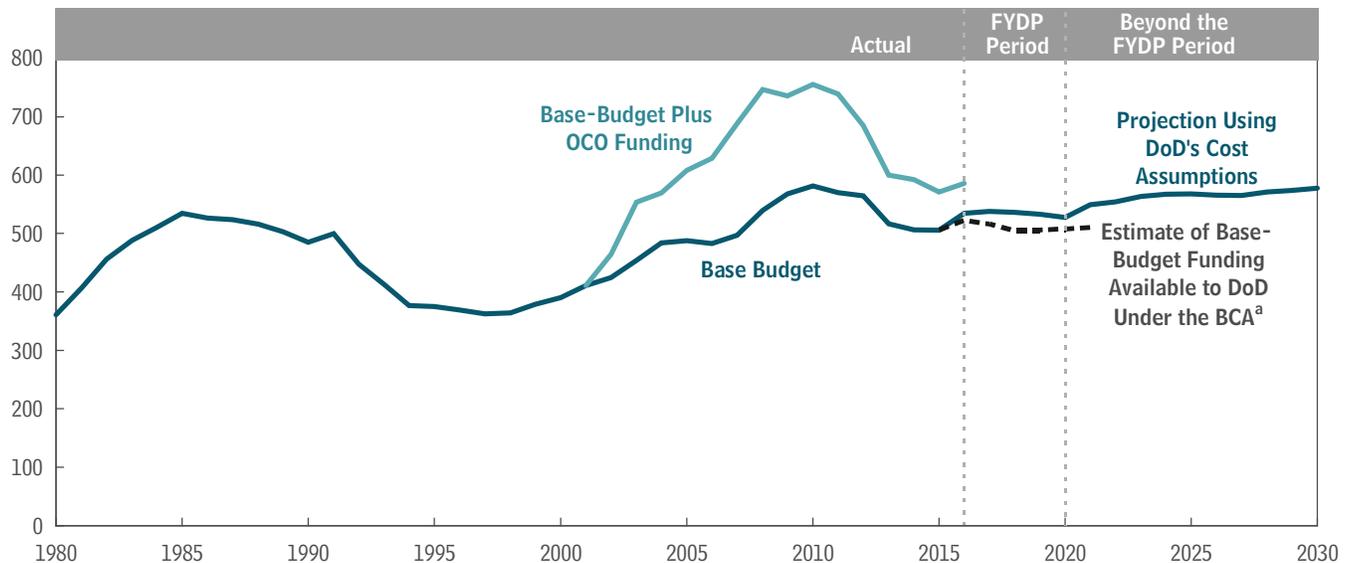
Contributing to DoD's projection of nearly flat budgets over the next five years are continued reductions in the number of active duty military personnel—from 1.31 million in 2016 to 1.27 million in 2020—as well as anticipated savings from a variety of other initiatives, including reforms to military compensation, a new round of base realignments and closures, and a restructuring of some elements of the force. Despite those changes, the shares of DoD's budget allocated to costs for operation and support (O&S) and acquisition would remain nearly

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1. It is difficult to draw conclusions from a comparison of the Administration's base-budget request and the appropriation for the base budget because the appropriations act funded some base-budget activities in the OCO budget. For example, see House Committee on Appropriations, *Department of Defense Appropriations Bill, 2016*, Draft Committee Report (June 2, 2015), page 61, <http://go.usa.gov/cQ4qY> (PDF, 6.7 MB).

**Summary Figure 1.****Historical Funding for DoD's Activities and Projected Costs of DoD's Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Base-budget data include supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown separately from the base-budget data. No OCO funding is shown for 2017 and later.

BCA = Budget Control Act of 2011; DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

- a. This estimate incorporates the assumption that the funding available to DoD would be equal to the BCA's limit for national defense minus the Administration's estimates for national defense funding for agencies other than DoD (that is, funding for the Department of Energy's nuclear weapons activities, intelligence-related activities, and the national security elements of the Departments of Commerce, Justice, and Homeland Security, and several independent agencies).

unchanged from 2016 to 2020. (O&S includes compensation for the department's military and civilian employees, military health care, and the department's other operation and maintenance activities; acquisition includes research, development, test, and evaluation as well as procurement of weapon systems and other major equipment.)

The Bipartisan Budget Act of 2015, which amended discretionary funding limits established under the Budget Control Act of 2011 (BCA), set new, higher limits for 2016 and 2017. Those limits apply to total funding (excluding OCO) for DoD, the nuclear weapons activities of the Department of Energy, and security activities in several other agencies that collectively are subject to the BCA's caps on national defense funding. The higher limits, combined with appropriations for OCO that include funding for some base-budget activities, very nearly accommodated the Administration's total request for national defense in 2016. (The appropriations for DoD in 2016 are about

\$5 billion, or 1 percent, less than the department requested.) The higher limit in 2017 falls short of the Administration's current base-budget plans for that year. Over the final four years of the FYDP, 2017 through 2020, the Administration's planned budgets for DoD and other national defense activities exceed the BCA's limits by a total of \$107 billion (in 2016 dollars).

## DoD's Plans Would Require Larger Budgets After 2020

Because decisions made in the near term can have consequences for the defense budget well after the five years described in the FYDP, CBO annually projects the budgetary impact of DoD's plans a decade or more beyond that period. For this analysis, CBO's projection spans the years 2021 to 2030. The projection is based on DoD's cost estimates in the 2016 FYDP as well as DoD's longer-term estimates, if available. (For example, DoD provides

annual cost estimates for major weapon acquisitions that often extend many years beyond the FYDP period.) Where estimates from DoD were not available (for example, estimates of the rise in labor costs), CBO used its projections of prices and compensation trends for the overall economy as the basis of its estimates of DoD's costs. The projection is not a prediction of future DoD budgets; it is an extrapolation of DoD's cost estimates under the assumption that the primary aspects of the current defense plan remain unchanged.

After staying fairly constant over the FYDP period, the cost of implementing DoD's plans would rise by 4 percent in 2021, CBO estimates. Costs would climb more slowly in most of the years thereafter, reaching \$577 billion in 2030—an average increase of 0.5 percent per year. That total is 2.2 percent of CBO's projection of GDP for that year.

The steeper increase projected for the years immediately following the FYDP period is attributable primarily to DoD's plans to develop and purchase new weapons (activities categorized as acquisition), the costs for which are estimated to increase by a total of 10 percent the first three years beyond the FYDP period before declining slowly through 2030. That “bow wave” in acquisition funding suggests that weapons development and procurement is currently being deferred to keep budgets constrained through the end of the FYDP period. In contrast to the sharp increase in acquisition costs, CBO projects that the costs for O&S would grow steadily at an average annual rate of 1.3 percent from 2020 through 2030. By that year, the costs for O&S would reach \$396 billion, an increase of 14 percent over the Administration's request for 2016.

### **Historical Experience Indicates That the Costs of Current Plans Will Probably Be Higher Than DoD Anticipates**

The FYDP and CBO's extension of DoD's costs through 2030 are estimates of long-term costs if current plans do not change. Of course, international events, decisions made by the Congress, and other factors could result in substantial departures from those plans. Nevertheless,

even if current plans remain generally unchanged, many program-level policies that underlie DoD's cost projections may not come to pass, and some of DoD's cost estimates may prove to be optimistic. For example, DoD's 2015 FYDP incorporated the assumption that the Air Force would begin to retire its fleet of A-10 attack aircraft and that DoD would implement certain changes to the military health care system—policies that were both blocked in the Congress. Furthermore, historical experience indicates that the FYDPs prepared by DoD often incorporate estimates that understate costs. If the Congress blocks similar policy proposals put forth in the 2016 FYDP or if costs in other areas grow as they have historically, DoD would need larger budgets to implement its plans.

Several areas of DoD's budget have frequently turned out to cost more than originally planned or to increase more rapidly than expected from an extrapolation of recent trends. Those areas include the following:

- Costs to develop and purchase weapon systems,
- Compensation costs for military and civilian personnel (including military health care), and
- Operation and maintenance costs.

How much the costs of specific programs in each of those areas might differ from DoD's current estimates is not certain. Changes could result from some combination of Congressional action, DoD's difficulty in controlling costs, or growth in costs in the economy as a whole. However, CBO projects that, if the costs in several broad areas of DoD's budget were to experience growth similar to that observed in its budgets in the recent past (CBO's historical-cost scenario), total costs for DoD from 2016 to 2020 would be about \$57 billion (or 2 percent) higher than indicated in the FYDP, and total costs from 2016 through 2030 would be \$318 billion (or 4 percent) higher than under current cost estimates (see Summary Table 1). About 40 percent of those higher costs through 2030 would result directly from the adoption of different policies than DoD has requested, most of which (\$118 billion) would require Congressional approval. The remaining higher costs would come from other factors that are harder to control.

**Summary Table 1.****Areas Where Costs of Current Plans Could Be Higher Than DoD's Estimates**

Billions of 2016 Dollars

	Total Increase	
	2016-2020	2016-2030
<b>Areas in Which Different Policies May Be Adopted</b>		
Increase Military Pay at the Rate of the ECI Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	13.4	73.9
Increase Civilian Pay at the Rate of the ECI Minus 0.6 Percentage Points (Average Since 2007) Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	5.0	29.0
Do Not Implement DoD's Proposals to Consolidate TRICARE Plans and Increase Various Fees	3.0	13.3
Do Not Implement DoD's Proposal to Institute TRICARE for Life Annual Enrollment Fees	0.4	1.4
Fund Military Construction at Historical Levels (Adjusted for Force Size)	9.4	9.4
<b>Areas in Which Costs Could Be Higher</b>		
Acquisition Costs for Major Programs Grow as They Have in the Past	22.7	155.5
O&M Costs (Adjusted for Force Size) Grow as They Have in the Past	2.7	35.7
<b>All Areas Combined</b>		
Total	56.6	318.3
<b>Memorandum:</b>		
Total Projected Costs		
DoD's estimates and their extension	2,669	8,323
CBO's alternative projections	2,725	8,641

Source: Congressional Budget Office.

Note: DoD = Department of Defense; ECI = employment cost index for wages and salaries in the private sector, as reported by the Bureau of Labor Statistics; O&amp;M = operation and maintenance.

# The Cost of DoD's Plans Through 2030

**A**lthough funding decisions are usually made on an annual basis, decisions about national defense that are made today—whether they involve issues such as weapon systems, military compensation, or numbers of personnel—can have effects on the composition and costs of the nation's armed forces that last for many years. To provide information about its plans beyond the coming year, the Department of Defense usually prepares a Future Years Defense Program in conjunction with its annual budget request. The FYDP is a detailed description of DoD's plans and its estimate of the costs of those plans over the coming five years. The most recent plan, the 2016 FYDP, was issued in March 2015 and covers fiscal years 2016 to 2020. Although DoD publishes information about even longer-term plans for some activities, such as shipbuilding and aircraft procurement, details about most activities beyond the FYDP period (and, therefore, estimates of DoD's total annual costs beyond that period) are not released to the public or provided to the Congress because they are either undetermined or yet to be officially adopted.

To provide a more complete picture of the funding that might be needed to implement DoD's current defense plans over the longer term, the Congressional Budget Office has, since 2003, projected DoD's total costs for roughly 10 years beyond the FYDP period. This report presents CBO's analysis of the 2016 FYDP and an extension of those plans from 2021 through 2030. The extension beyond the FYDP period is based on DoD's current cost estimates for its planned programs and activities and, where DoD estimates are not available, CBO's estimates of prices and compensation trends for the overall economy. The analysis does not predict future DoD budgets but rather extrapolates DoD's cost estimates with the assumption that the primary aspects of its plans—specifically, the size and composition of the military force, and the type, quantity, and schedule of major weapons purchases—do not change. CBO's projection of

costs beyond the FYDP period indicates that DoD's current plans would require a sharp increase in those years, as often occurs when near-term resources are constrained.

Because some cost estimates embedded in DoD's plans are different (usually lower) than the actual costs the department has, historically, incurred, CBO also examined how costs would differ if certain policies and assumptions about costs that underlie DoD's projections did not come to pass. Under a historical-cost scenario, CBO estimated what the costs of DoD's plans would be if many of its individual programs and activities were subject to policies or incurred costs that are more consistent with its recent historical experience than with its current estimates.

Under either set of estimates, the cost of DoD's plans for its base budget would exceed the caps on funding for national defense established by the Budget Control Act of 2011, as amended, over the five-year period covered by the 2016 FYDP (2016 through 2020) and in 2021, which is the final year such funding is capped by the BCA. Nevertheless, the costs of DoD's plans for its base budget relative to CBO's projection of the size of the economy (as measured by gross domestic product) would slowly decrease over time. However, DoD's total costs in the coming years will also depend on costs for overseas operations that are not included in the base budget.

Changes in the international security environment, decisions made by the Congress, and other factors might cause substantial departures from the department's current plans. For example, DoD and the Congress frequently respond to higher-than-expected costs of weapon systems by changing acquisition plans, often delaying or reducing purchases or canceling systems outright. In this report, however, CBO did not examine how DoD's plans might change as a result of such factors.

## Costs of DoD's Plans For 2016 Through 2020

DoD estimates that the annual costs of its plans will remain fairly steady in real terms over the period covered in the 2016 FYDP, averaging \$534 billion per year in 2016 dollars.<sup>1</sup> Those costs are less than 1 percent higher than the costs anticipated in the previous year's FYDP for 2016 through 2019, the fiscal years common to both plans.

### The Budget Request for 2016

The Administration requested a total of \$585 billion in new discretionary budget authority for DoD in fiscal year 2016. That request has two parts:

- \$534 billion for the base budget, which funds the normal activities of the department, including manning and training the force, developing and procuring weapon systems, and the day-to-day operations of the military and civilian workforce; and
- \$51 billion for overseas contingency operations, such as Operation Freedom's Sentinel in Afghanistan and Operation Inherent Resolve in Iraq and Syria.

CBO's analysis focuses on DoD's base budget. The request for DoD's base budget in 2016 is, after accounting for inflation, 6 percent more than the amount that the Administration requested—and the nearly identical amount that the Congress approved—for 2015.

The Consolidated Appropriations Act, 2016, largely matched the total amount requested by DoD, providing a total of \$580 billion for the base budget and OCO combined—more than 99 percent of the Administration's request. However, lawmakers funded some base-budget activities in the OCO account, appropriating \$522 billion for DoD's base budget and \$59 billion for OCO. The cut of nearly 1 percent in DoD's total request was

1. Unless otherwise noted, all costs in this report apply to fiscal years and are expressed in fiscal year 2016 dollars of total obligational authority (TOA). DoD uses TOA to measure the funding available for its programs each year. After 2016, TOA is almost identical, through the FYDP period, to discretionary budget authority, which describes the authority provided by an appropriation act to incur financial obligations. TOA differs from discretionary budget authority in several ways; most notably, it adjusts for the timing of rescissions and lapses of prior-year budget authority. In recent years, the difference between TOA and discretionary budget authority in DoD's budget request for the coming year has generally been \$1 billion or less.

not spread evenly among the major appropriation categories. For example, funding for operation and maintenance (O&M) was reduced by \$7 billion, or 3 percent; funding for procurement was increased by \$4 billion—a 4 percent increase. Much of that added funding will be used to purchase more fighter aircraft and to provide incremental funding for an Arleigh Burke class destroyer.

Nearly all of DoD's funding for its base budget is provided in six appropriation categories (see Figure 1-1). In its analysis of DoD's plans, CBO organized those six categories into three broader groups: operation and support, acquisition, and infrastructure.

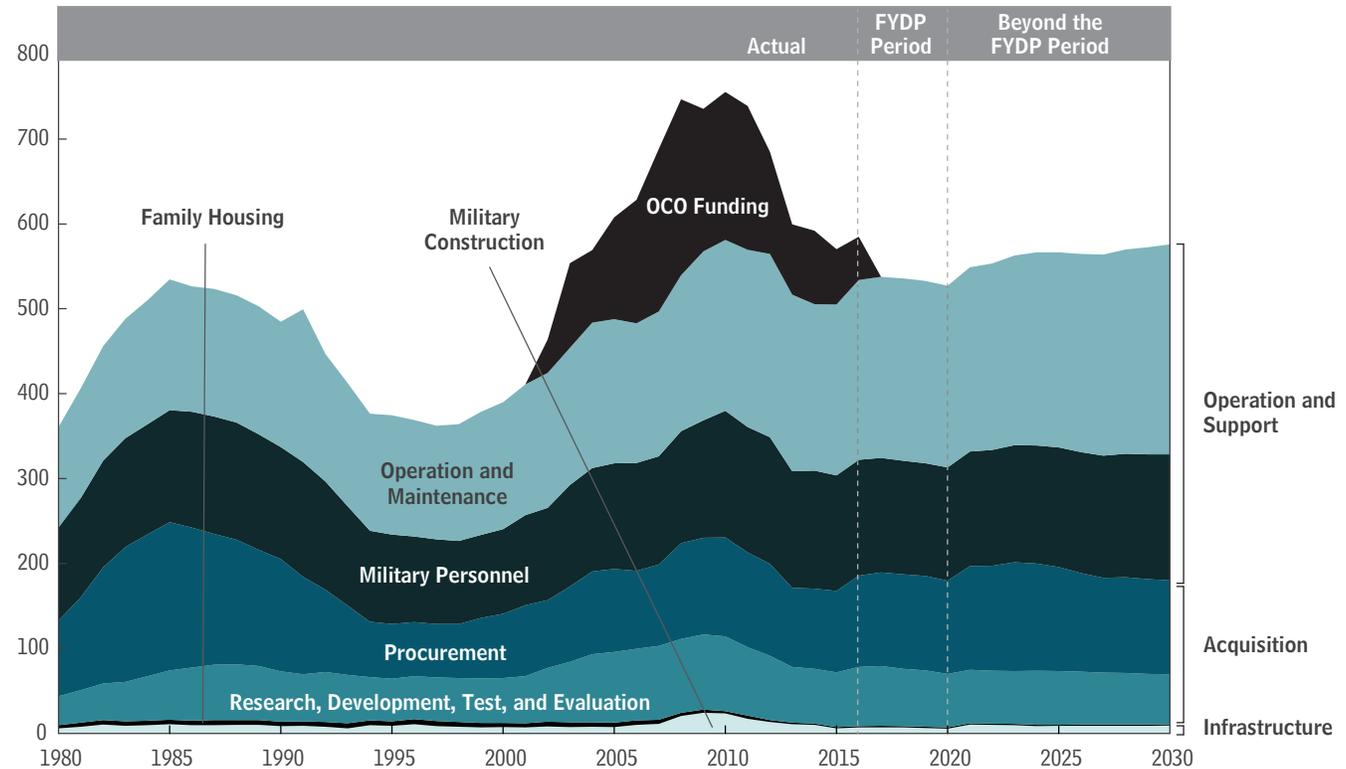
**Operation and Support.** This group includes the appropriations for O&M, revolving and management funds (folded in with O&M because they fund similar types of activities and the revolving and management fund appropriations are relatively small), and military personnel. Appropriations for O&M and the revolving and management funds pay for the day-to-day operations of the military, base support, the maintenance of equipment, spare parts, the training of military units, the majority of costs of the military's health care program, compensation for most of DoD's civilian employees, and payments to DoD's support contractors. Appropriations for military personnel fund compensation for uniformed service members, including pay, enlistment and retention bonuses, housing and food allowances, and related items, such as the cost of moving service members and their families to new duty stations. O&M and revolving and management funds together make up the largest portion—39 percent—of the request for the base budget in 2016; military personnel is the next largest, at 26 percent.

**Acquisition.** This group includes procurement and research, development, test, and evaluation (RDT&E). Appropriations for procurement fund the purchase of new weapon systems and other major equipment, as well as upgrades to existing weapon systems. Appropriations for RDT&E pay for the development of technology and weapons. Procurement is 20 percent of the request for the base budget in 2016; RDT&E is 13 percent.

**Infrastructure.** This group includes construction and renovation at DoD facilities. Appropriations for military construction and family housing fund the construction of buildings and a portion of the housing on military installations. Together, they make up the remaining 2 percent of the request for the base budget.

**Figure 1-1.****Costs of DoD's Plans, by Appropriation Category**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each category includes supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown in a separate category. No OCO funding is shown for 2017 and later.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

**DoD's Estimates For 2017 through 2020**

DoD estimates that its base budget will remain essentially constant over the FYDP period (see Figure 1-1). Costs would increase slightly for 2017, followed by very small decreases through 2020. In real terms, costs in 2020 would be 1.3 percent lower than the request for 2016 but still 4.3 percent higher than the amount enacted for 2015.

Although total costs would remain steady over the FYDP period, the distribution of costs within the overall budget would change somewhat. In particular, the portion of DoD's budget allocated to O&S would remain almost unchanged over the FYDP period, but a 2.6 percent decrease in the costs of military personnel would be offset by a 1.1 percent increase in O&M costs. The decrease in military personnel costs closely matches the 2.5 percent

decrease planned for the size of the military as measured by the number of active-duty personnel. The rise in O&M costs despite the shrinking force size would continue a long-standing trend of steadily increasing operations costs per service member. (See Chapter 2 for further details.)

By DoD's estimate, acquisition would continue to consume about one-third of DoD's budget through 2020. In real terms, total acquisition costs in 2020 would be 2.5 percent lower than in 2016. That change would include a 2.4 percent increase in procurement but a 10 percent decrease in RDT&E. The 16 percent decrease in the budget for infrastructure by 2020 would result from DoD's planned decrease of 20 percent, or about \$1.4 billion, in funding for military construction relative to its plan for 2016.

**Table 1-1.****Cost Assumptions for CBO's Extension of DoD's Plans**

	<b>Assumptions for the Projection</b>
Military Pay	DoD's estimates through 2020; rate of growth matches CBO's projection of the ECI after 2020
Civilian Pay	DoD's estimates through 2020; rate of growth matches CBO's projection of the ECI after 2020
Military Health Care	DoD's estimates through 2020; after 2020, tracks CBO's projection of national growth rates for health care spending
Operation and Maintenance <sup>a</sup>	DoD's estimates through 2020; after 2020, costs aside from civilian pay and military health care grow at the historical average rate for operation and maintenance
Acquisition	DoD's estimates with no cost growth
Military Construction	DoD's estimates through 2020; in 2021, costs equal the historical average and thereafter grow at CBO's projection of the national growth rate for construction costs
Family Housing	DoD's estimates through 2020; after 2020, costs grow at CBO's projection of the national growth rate for housing costs

Source: Congressional Budget Office.

Note: DoD = Department of Defense; ECI = employment cost index for wages and salaries in the private sector, as reported by the Bureau of Labor Statistics.

a. Operation and maintenance costs, excluding civilian pay and military health care.

## **CBO's Extension of DoD's Plans For 2021 Through 2030**

In analyzing DoD's plans beyond the FYDP period, CBO started with DoD's estimates of costs and force structure (that is, the number of major combat units, such as infantry brigades, battle force ships, and aircraft squadrons) for 2020. For 2021 through 2030, CBO's extension of DoD's plans is based as much as possible on policies underlying the cost estimates in the 2016 FYDP, current laws regarding the compensation of military personnel, and the longer-term acquisition plans that DoD publishes in selected acquisition reports and other official documents, such as the Navy's 30-year shipbuilding plan.<sup>2</sup> For the parts of DoD's budget where such policies

are not specified, CBO based its extension of DoD's plans on prices and compensation trends in the general economy (see Table 1-1). For the years beyond 2020, the estimate incorporates the assumptions that the force structure and the number of military and civilian personnel will remain at the levels planned by DoD for 2020, and that acquisition plans for major weapon systems—types, quantities, and schedules—will not change.

After staying fairly constant over the FYDP period, the cost of implementing DoD's plans would jump by 4 percent in 2021, CBO projects. Costs would continue to climb, reaching \$568 billion in 2025, and would remain at about that level through 2027 before climbing again. CBO projects costs of \$577 billion at the end of the projection period in 2030, which would result in a DoD budget that is 8 percent higher in real terms than the amount requested in 2016 (see Table 1-2). Average annual costs in the 10 years beyond the FYDP period would be 6 percent higher than the annual average over the FYDP period. All three portions of DoD's budget would contribute to higher costs beyond the FYDP period but by different amounts and with very different profiles (see Figure 1-2).

2. If a weapon system is expected to reach the end of its service life before 2030 and DoD has not yet announced plans for a replacement system, CBO assumes that the department will develop and purchase a generally similar but more modern system to replace the aging one (for example, a class of destroyer would be replaced with a more modern class of destroyer). DoD has not published plans for minor programs extending beyond the FYDP period. Therefore, CBO estimated costs for those programs on the basis of historical correlations between funding for major and minor programs.

**Table 1-2.****Projected Costs of DoD's Plans in Selected Years**

Billions of 2016 Dollars

	2001	2014	FYDP Period		Beyond the FYDP Period		Average, 2016–2030
			2016	2020	2025	2030	
<b>Base Budget</b>							
Operation and Support							
Operation and maintenance <sup>a</sup>	154	196	212	214	230	248	226
Military personnel	106	139	137	133	141	148	139
Subtotal	260	335	348	347	371	396	365
Acquisition							
Procurement	83	95	108	110	123	111	116
Research, development, test, and evaluation	55	65	70	63	64	60	64
Subtotal	139	159	178	173	187	171	180
Infrastructure							
Military construction	7	10	7	6	9	9	8
Family housing	5	2	1	1	1	1	1
Subtotal	12	11	8	7	10	11	10
<b>Total Base Budget</b>	<b>411</b>	<b>506</b>	<b>534</b>	<b>527</b>	<b>568</b>	<b>577</b>	<b>555</b>
<b>Supplemental and Emergency Funding for Overseas Contingency Operations</b>							
Total OCO Funding	n.a.	86	51	n.a.	n.a.	n.a.	n.a.
<b>Total</b>							
<b>Total DoD Budget</b>	<b>411</b>	<b>592</b>	<b>585</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>	<b>n.a.</b>

Source: Congressional Budget Office.

Notes: CBO projects the costs of DoD's plans using the department's estimates of costs where they are available and costs that are consistent with CBO's projections of price and compensation trends in the overall economy where the department's estimates are not available.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 to 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations; n.a. = not applicable.

- a. For this analysis, CBO folded appropriations for most revolving and management funds (such as the one for the Defense Commissary Agency) into the appropriations for operation and maintenance. For 2001 and 2014, CBO treated as acquisition the accounts in the National Defense Sealift Fund that were used to purchase ships during those years.

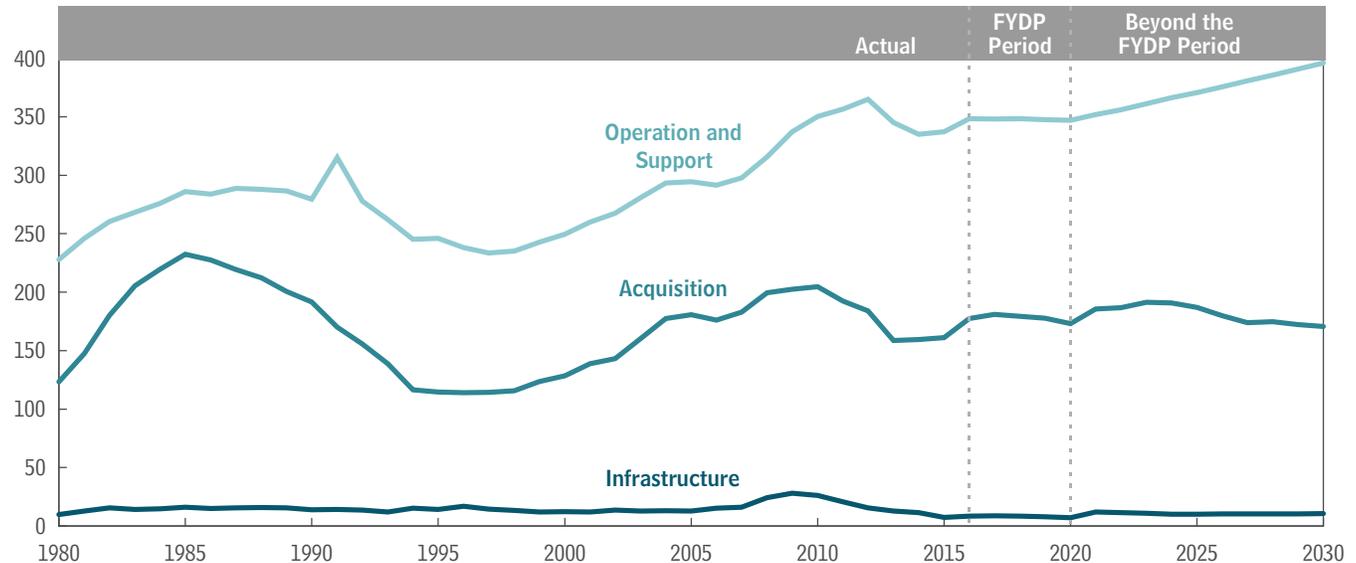
Almost all of the difference between DoD's total costs in the final year of the FYDP (2020) and DoD's total costs at the end of CBO's projection period (2030) would result from higher costs for operation and support. O&S costs would increase steadily from 2020 through 2030, growing by an average of 1.3 percent annually (in real terms), for a total increase of 14 percent. Operation and maintenance costs would grow by 16 percent over that time and account for almost 70 percent of the increase in O&S costs. Costs for military personnel, which are substantially lower than those for O&M, would grow by 11 percent and account for the remaining 30 percent of

the increase in O&S costs. The factors leading to increased costs for O&S are described in Chapter 2.

Acquisition costs would increase by more than 10 percent, to \$191 billion, in the first three years beyond the FYDP period. But those costs would decline thereafter, almost matching their 2020 level by 2027. Funding for procurement would increase by 16 percent between 2020 and 2023 but then decline to the 2020 level by 2030. That "bow wave" in procurement funding suggests that weapons acquisition is currently being deferred to constrain budgets through the end of the FYDP period.

**Figure 1-2.****Costs of the Operation and Support, Acquisition, and Infrastructure Portions of DoD's Base Budget**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: The operation and support category includes the military personnel, operation and maintenance, and revolving and management fund appropriations. The acquisition category includes the procurement and the research, development, test, and evaluation appropriations. The infrastructure category includes the military construction and family housing appropriations.

Base-budget data include supplemental and emergency funding before 2002.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified.

Funding for RDT&E would be fairly steady from 2021 through 2030, with a slight decrease in the last two years of the period. Additional details about CBO's projection of acquisition costs can be found in Chapter 3.

Infrastructure costs would also be higher for the years beyond the FYDP period. Under CBO's estimates, those costs would average about \$11 billion per year from 2021 to 2030, as opposed to DoD's estimate of an annual average of \$8 billion for FYDP period. The estimated difference between the two time periods is substantial on a percentage basis primarily because funding for military construction in the FYDP is significantly lower than historical amounts. That difference would, however, contribute only slightly to the overall increase in total costs beyond the FYDP period because infrastructure accounts for scarcely more than 1 percent of DoD's planned budget in the final year of the FYDP. Additional details about CBO's analysis of infrastructure costs can be found in Chapter 4.

### Why Costs Will Probably Be Higher Than DoD Estimates

The total budget for an organization as large as DoD is an outcome of many program-specific policies. Even if DoD's plans remain unchanged in terms of the size and composition of the military and the types, quantities, and acquisition schedules for major weapon systems, some of DoD's specific assumptions about policies may prove to be inaccurate. For example, DoD's 2016 FYDP includes savings resulting from several proposed changes to military health benefits, most of which are essentially carried over from similar proposals that the Congress rejected during its deliberations on the 2015 budget. The National Defense Authorization Act (NDAA) for 2016 again rejects most of DoD's proposed changes to military health care benefits, so the corresponding savings that are built into DoD's 2016 FYDP will not be realized. When DoD's assumptions about specific programs to acquire weapon systems prove to be incorrect, the costs of those programs are frequently higher than the department's current estimates. As a result, DoD is forced to either

request larger budgets or alter its plans in other areas to offset those higher costs.

CBO has identified several areas of DoD's budget in which costs have frequently deviated from the department's estimates, usually resulting in cost increases. Most of the difference between DoD's estimated costs and actual costs can be linked to three factors:

- Assumptions about changes in policy that require approval by lawmakers,
- The effectiveness of policies to control costs, and
- Growth in costs in the broader economy that DoD cannot control.

Examples of policy changes that typically require lawmakers' approval and can have a large effect on DoD's budget include military and civilian pay raises, copayments and enrollment fees for participants in the Military Health System (MHS), and undertaking base realignments and closures. Examples of ways that DoD could control costs include limiting the growth in performance requirements for new weapons and improving contracting procedures for medical services. DoD is largely unable to control the prices of some goods and services such as fuel and other commodities that are purchased from the national or global economy.

It is difficult to predict by how much specific programs might deviate from DoD's assumptions and what the corresponding changes in costs would be. However, CBO estimates that if the costs in several broad areas of DoD's budget were to increase by amounts similar to those observed in DoD's budgets in the recent past (CBO's historical-cost scenario), cumulative costs for DoD's plans from 2016 to 2020 would be \$57 billion (or 2 percent) higher than indicated in the FYDP. Cumulative costs for 2016 through 2030 would be \$318 billion (or 4 percent) higher than the extension of the FYDP based on DoD's cost estimates (see Table 1-3).

Close to half of the \$318 billion difference in the two projections of costs for the 2016–2030 period arises from higher estimates of the costs of developing and producing new weapon systems. During the past several decades, those costs have been, on average, 20 percent to 30 percent higher than the department's initial estimates. Although DoD and the Congress have made and are considering

further changes to the way that weapon systems are developed and purchased, it is not yet clear whether those efforts will lower the growth in costs below historical averages. Most of the remaining part of the difference reflects the higher costs that DoD would have to pay to compensate military and civilian personnel if the Congress does not approve the department's recommended policy changes. Chapter 2 provides a more detailed description of the alternative estimates for O&S activities. Chapter 3 provides more details about the alternative estimates of acquisition costs.

### **Costs of DoD's Plans in the Context of the Budget Control Act**

The Budget Control Act of 2011 established limits, or caps, on most discretionary appropriations through 2021, including those for national defense. (National defense, which is budget function 050, includes the appropriations for DoD, the Department of Energy's nuclear weapons activities, intelligence-related activities, and the national security elements of the Departments of Commerce, Justice, Homeland Security, and several independent agencies.) However, defense appropriations that are designated for OCO or as emergency requirements are not constrained by the BCA's caps. The limits imposed by the BCA have been increased three times since it became law: by the American Taxpayer Relief Act of 2012; by the Bipartisan Budget Act of 2013; and, most recently, by the Bipartisan Budget Act of 2015. Taken together, those laws eased the constraints on funding each year from 2013 to 2017 but left intact the limits imposed by the BCA for the remaining years through 2021.

Under the terms of the BCA, if appropriations for the base budget exceeded the BCA's limit in any year between 2016 and 2021, a sequestration (the cancellation of budgetary resources after they have been appropriated) would occur in an amount equal to the overage (that is, the difference between the appropriated amounts and the BCA's limit in that year). In that case, funding for both the base budget and overseas contingency operations would be subject to sequestration. However, if lawmakers provided amounts for defense appropriations in 2016 to 2021 that were consistent with the BCA's limits on funding for national defense, there would be no sequestration either of base-budget funding or of funding for overseas contingency operations.

**Table 1-3.****Increase in DoD's Costs Relative to the FYDP Under CBO's Historical-Cost Scenario**

Billions of 2016 Dollars

	Average Annual Increase		Total Increase		
	2016- 2020	2021- 2030	2016- 2020	2021- 2030	2016- 2030
<b>Areas in Which Different Policies May Be Adopted</b>					
Increase Military Pay at the Rate of the ECI Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	2.7	6.1	13.4	60.5	73.9
Increase Civilian Pay at the Rate of the ECI Minus 0.6 Percentage Points (Average Since 2007) Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	1.0	2.4	5.0	24.0	29.0
Do Not Implement DoD's Proposals to Consolidate TRICARE Plans and Increase Various Fees	0.6	1.0	3.0	10.4	13.3
Do Not Implement DoD's Proposal to Institute TRICARE for Life Annual Enrollment Fees	0.1	0.1	0.4	1.0	1.4
Fund Military Construction at Historical Levels (Adjusted for Force Size)	1.9	0.0	9.4	0.0	9.4
<b>Areas in Which Costs Could Be Higher</b>					
Acquisition Costs for Major Programs Grow as They Have in the Past	4.5	13.3	22.7	132.8	155.5
O&M Costs (Adjusted for Force Size) Grow as They Have in the Past	0.5	3.3	2.7	33.0	35.7
<b>All Areas Combined</b>					
Total	11.3	26.2	56.6	261.7	318.3

Source: Congressional Budget Office.

Note: DoD = Department of Defense; ECI = employment cost index for wages and salaries in the private sector, as reported by the Bureau of Labor Statistics; FYDP = Future Years Defense Program; O&amp;M = operation and maintenance.

When the President's budget request for 2016 was submitted in February 2015, the BCA cap for national defense for 2016 was \$523 billion. For 2016, the Administration requested \$561 billion for national defense, which exceeded the BCA cap for that year by \$38 billion; the Administration also requested \$51 billion for OCO, which is not constrained by the BCA caps. Therefore, the total request for discretionary funding for national defense was \$612 billion; of that amount, \$585 billion was for DoD.

The Bipartisan Budget Act of 2015, which was signed by the President on November 2, 2015, increased the BCA cap for national defense funding in 2016 from \$523 billion to \$548 billion. In the Consolidated

Appropriations Act, 2016, a total of \$26.4 billion subject to the cap was provided for national security activities in agencies other than DoD. The \$522 billion remaining under the new cap was appropriated for DoD's base budget. That amount is \$13 billion less than the Administration's \$534 billion request for DoD's base budget, but appropriations of \$59 billion for OCO are \$8 billion more than the amount requested (see Table 1-4). Consequently, DoD received a total of \$580 billion of the \$585 billion requested for 2016, or 99 percent of its request.

Although the Bipartisan Budget Act of 2015 increased the cap on funding for national defense in 2017, that amount is still below the Administration's current plans for that year, which call for a DoD base budget of

**Table 1-4.**

### Costs of DoD's Base-Budget Plans Compared With the Funding Projected to Be Available Under the Limits of the Budget Control Act of 2011 as Modified by the Bipartisan Budget Act of 2015

Billions of Dollars

	FYDP Period					Totals		
	2016	2017	2018	2019	2020	2021	2016-2020	2016-2021
	<b>Nominal Dollars</b>							
Projected Costs of DoD's Plans <sup>a</sup>	534	547	556	564	570	606	2,772	3,378
Estimate of DoD's Funding Limits Under the BCA <sup>b</sup>	522	525	520	534	547	560	2,648	3,208
Amount That Must Be Cut From DoD's Base-Budget Plans or Redesignated for OCO to Stay Within the BCA's Limits	13	22	36	31	23	46	125	170
	<b>2016 Dollars</b>							
Projected Costs of DoD's Plans <sup>a</sup>	534	538	536	533	527	549	2,669	3,218
Estimate of DoD's Funding Limits Under the BCA <sup>b</sup>	522	516	501	504	506	508	2,549	3,057
Amount That Must Be Cut From DoD's Base-Budget Plans or Redesignated for OCO to Stay Within the BCA's Limits	13	22	35	29	21	41	120	161

Source: Congressional Budget Office.

Note: BCA = Budget Control Act of 2011; DoD = Department of Defense; FYDP = Future Years Defense Program; OCO = overseas contingency operations.

- a. CBO projects the costs of DoD's plans beyond the FYDP period using the department's estimates of costs where they are available and costs that are consistent with CBO's projections of price and compensation trends in the overall economy where the department's estimates are not available.
- b. This estimate incorporates the assumption that the funding provided to DoD would be equal to the BCA's limit for all of national defense minus the Administration's estimates for national defense funding for agencies other than DoD (that is, funding for the Department of Energy's nuclear weapons activities, intelligence-related activities, and the national security elements of the Departments of Commerce, Justice, and Homeland Security, and several independent agencies).

\$547 billion (in nominal dollars). If DoD receives its historical share of funding for national defense, it would receive \$525 in base budget funding under the BCA. The Bipartisan Budget Act of 2015 did not change the caps for 2018 through 2021.

If the national defense funding provided to DoD and the other agencies involved in national defense activities equaled the Administration's estimates, funding for national defense would exceed the BCA's caps by a total of \$107 billion in 20126 dollars over the FYDP period. On the basis of the increase in costs for 2021 indicated by CBO's extension of DoD's cost estimates beyond the FYDP period, national defense costs under DoD's plans would exceed the national defense cap by \$41 billion (in 2016 dollars) in 2021, the final year that is subject to the caps set in the BCA.

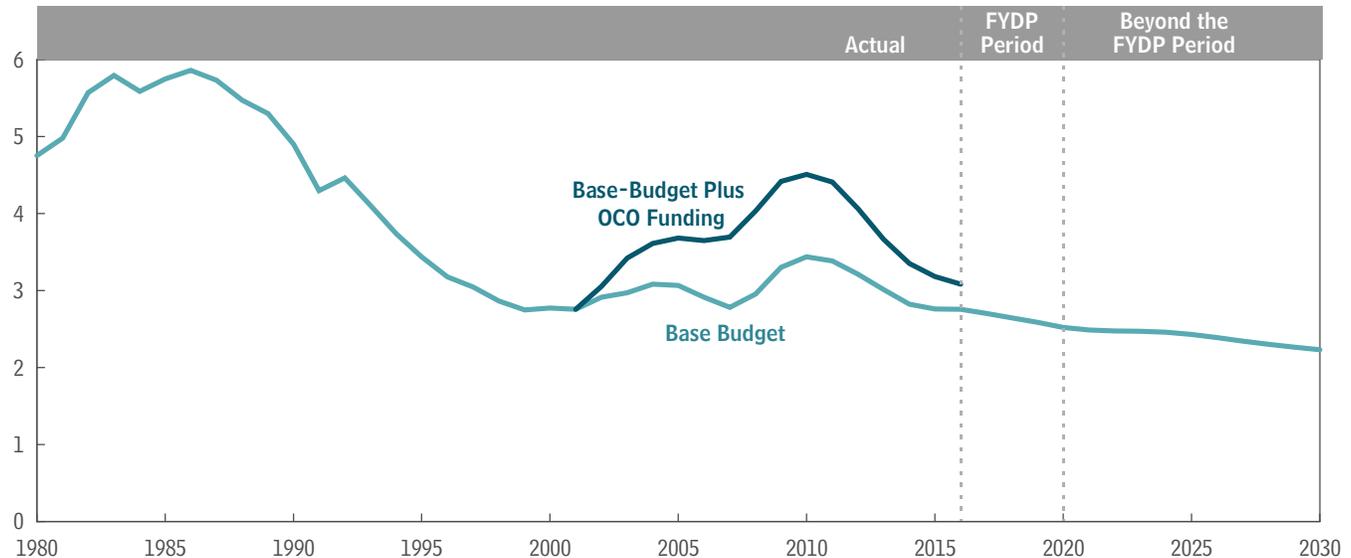
### Costs of DoD's Plans in a Broader Context

CBO's analysis is intended to highlight the long-term budgetary implications of DoD's plans as specified in the 2016 FYDP; it is not an evaluation of the affordability of those plans or of the relationship between those plans and the nation's defense needs, nor does it presume implementation of a particular strategy. When assessing the affordability of defense plans, some analysts consider the federal government's overall budget situation, including the costs of other programs and the amount of revenues being collected, whereas other analysts focus on the share of overall economic output (as measured by GDP) that is being used for defense.

Although the projected costs of DoD's base-budget plans would be higher in 2030 than in the years covered by the FYDP, the increase in costs would not be as rapid as

**Figure 1-3.****Outlays Under DoD's Plans as a Share of Economic Output**

Percentage of Gross Domestic Product



Source: Congressional Budget Office.

Note: For this figure, estimates describe outlays (as opposed to total obligational authority, which is depicted in the other figures).

Base-budget data include supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown separately from the base-budget data. No OCO funding is shown for 2017 and later.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

the growth of the economy that CBO projects. Consequently, spending as a share of GDP would decline over time (see Figure 1-3). Outlays for DoD as a share of GDP fell from an average of 5.5 percent in the 1980s to an average of 3.7 percent in the 1990s. With supplemental and emergency spending for the wars in Iraq and Afghanistan included, DoD's outlays as a share of GDP rose above 4 percent after 2007, peaking at 4.5 percent in 2010. Outlays for the base budget also reached a high point in 2010 at 3.4 percent of GDP. By 2015, outlays for the base budget had dropped to 2.8 percent of GDP. The latter percentage is about the same as it had been in 2001, although funding for OCO accounted for an additional 0.3 percentage points of GDP in 2015.

According to the 2016 FYDP, CBO's extension of DoD's base-budget plans through 2030, and CBO's projections of growth in the economy, the outlays needed to implement DoD's plans would decline from 2.8 percent of GDP in 2016 to 2.6 percent by 2020 and 2.3 percent by

2030—quite low by historical standards. Nevertheless, the average obligational authority needed to implement the plan, \$534 billion per year for 2016 through 2020, would be greater than DoD's obligational authority for the base budget in all but six years (1985 and 2008 through 2012) since 1980, after adjusting for inflation. Furthermore, any future spending for overseas contingency operations would, all else being equal, increase the share of GDP spent on defense above those amounts.

## Costs for Overseas Contingency Operations

Operation Freedom's Sentinel in Afghanistan and Operation Inherent Resolve in Iraq and Syria are ongoing, and those and other operations that might arise add to the costs in DoD's base budget. From 2001 to 2015, DoD's appropriations for overseas contingency operations totaled almost \$1.8 trillion (in 2016 dollars), an average of \$117 billion per year, or nearly 20 percent

of the department's total funding during that period. Funding designated for overseas contingency operations is not constrained by the caps established in the BCA.

DoD requested \$51 billion for OCO in 2016. Of that total, \$24 billion was to pay for the operations of U.S. forces in Afghanistan and associated in-theater support missions. The remainder was to be allocated to other operations and related activities, such as repairing or replacing worn equipment, supporting coalition military forces, and conducting other counterterrorism operations. The Consolidated Appropriations Act, 2016, provided an additional \$8 billion in OCO funding for base-budget activities.

It is unclear how much DoD will request for OCO in future years. Some overseas operations are expected to continue after 2016, but the FYDP does not include estimates of the funding that might be requested to support them in those years.<sup>3</sup>

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3. The President's budget for fiscal year 2016 included \$27 billion a year in OCO funding for 2017 through 2021. Those amounts are identified as placeholders that indicate an expectation of ongoing costs for OCO; they are not meant to indicate costs for specific plans. Future requests will be based on the circumstances at the time.



## Projections of Operation and Support Costs

**F**unding for operation and support is the sum of the appropriations for military personnel, operation and maintenance, and revolving and management funds.<sup>1</sup> Those appropriations are used for the compensation of most of DoD's uniformed and civilian personnel, the majority of costs of the military's health care program, and most of the day-to-day operations of the military. For 2016, the Administration requested \$348 billion for O&S: \$137 billion for military personnel and \$212 billion for O&M (including the revolving and management funds). That amounts to about two-thirds of its total request for the Department of Defense, excluding funding for overseas contingency operations. For 2016, \$43.5 billion of the \$51 billion requested for OCO was for O&S, more than 90 percent of which was for O&M. This report, however, does not address those OCO costs. The Consolidated Appropriations Act, 2016, provided about \$8 billion (or 2 percent) less in total funding for O&S (base budget plus OCO) than the amounts

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1. For this report, CBO folded the amounts appropriated for revolving and management funds into the appropriation for operation and maintenance because they fund similar types of activities and the revolving and management fund appropriations are relatively small. DoD uses revolving and management funds to pay for many services and goods provided within the department. Customers (usually military units or commands) purchase services and goods such as depot maintenance, fuel, and spare parts (usually with O&M funding) from organizations within DoD or the military services that exist to provide them. Those organizations then bill their customers accordingly through revolving and management funds. In principle, the prices of those services and goods match the costs of providing them. In years in which there is a shortfall in a particular fund, the Congress sometimes provides an appropriation to bring the fund into balance. Thus, the appropriation for revolving and management funds is the sum of all the shortfalls to be eliminated in a given year. That appropriation is relatively small. For 2016, the Administration requested \$210 billion for O&M and \$1.8 billion for revolving and management funds. Appropriations in the base budget for revolving and management funds have averaged less than \$3 billion per year since 1980. The largest share of that appropriation (typically about \$1 billion) is usually for DoD's commissaries because the prices that they charge military customers are, by design, lower than their costs.

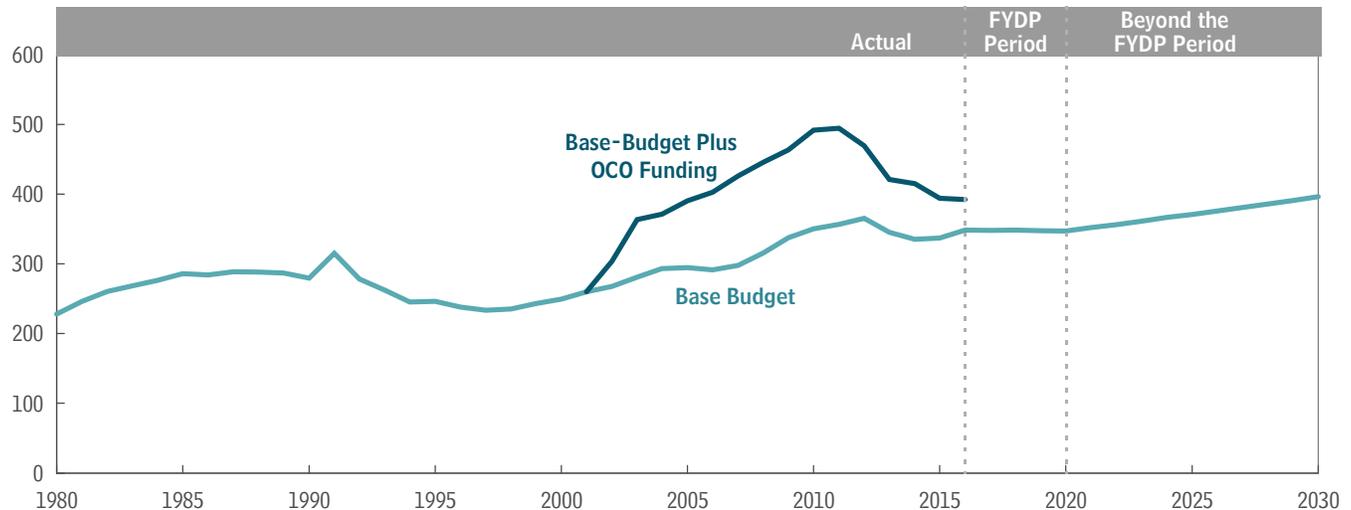
requested by the Administration. Those changes were relatively small and will probably have little effect on DoD's plans through the period spanned by the Future Years Defense Program (2016 to 2020). Therefore, this report, which was largely prepared before the appropriations were enacted, focuses on DoD's plans and not the actual 2016 appropriations.

According to DoD, the costs to implement its plans for O&S would remain nearly constant in real terms from 2016 to 2020 (see Figure 2-1). The distribution of costs within O&S would shift only slightly from military personnel to O&M over that period; by 2020, funding for military personnel would be 2.6 percent lower and the funding for O&M would be 1.1 percent higher than the amounts DoD requested for 2016. The decrease in funding for military personnel is consistent with the planned decrease in the number of service members over the next five years.

For the years beyond the FYDP period, CBO's analysis indicates that the funding for O&S needed to implement DoD's plans will steadily increase. Using as a basis the policies and their associated costs that DoD anticipates will be in place during the FYDP period, CBO estimates that the funding for O&S needed to implement DoD's current plans would increase at an average annual rate of 1.3 percent above the rate of inflation in the 10 years beyond the FYDP period, reaching \$396 billion in 2030. The funding needed to implement DoD's plans could be higher still if DoD's cost estimates for the FYDP period prove to be low, or if planned cost-saving policies are not approved by the Congress or are ineffective, as has often been the case in the past. CBO's analysis indicates that, if O&S costs follow historical patterns, the total O&S costs to implement DoD's current plans would be 2 percent higher over the FYDP years than DoD estimates and 4 percent higher from 2021 through 2030 than CBO's projection of DoD's plans using DoD's costs as a basis would suggest.

**Figure 2-1.****Costs of DoD's Operation and Support Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Base-budget data include supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown separately from the base-budget data. No OCO funding is shown for 2017 and later.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

**How CBO Projected O&S Costs**

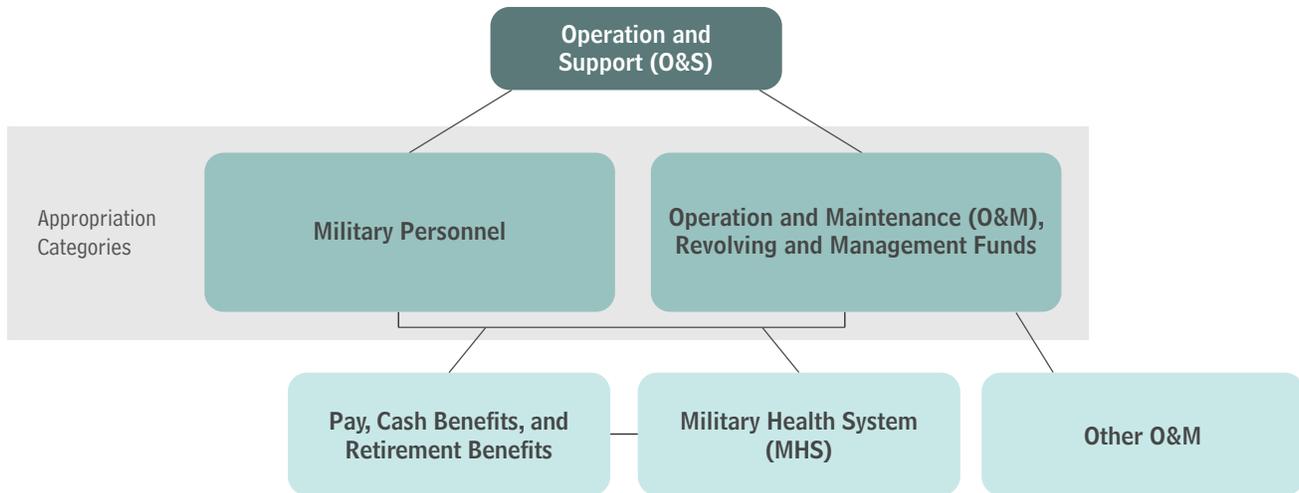
CBO projected the future O&S costs of DoD's plans in three parts (which do not directly correspond with the two appropriation categories within O&S):

- Cash compensation, consisting of pay and cash benefits for military personnel and DoD's civilian employees and accrual payments for military retirement (those costs total \$201 billion in the budget request for 2016);
- The Military Health System, which provides medical care for military personnel, military retirees, and their families (those costs total \$47 billion in the 2016 request); and
- Other O&M costs, such as base operations, fuel, repairs, and spare parts (those costs total \$121 billion in the 2016 request).

The sum of those three categories is greater than the total for O&S because some costs are included in more than one category (see Figure 2-2). For example, the cost of salaries

for uniformed service members and federal civilian employees in the MHS is included in both the cash compensation category and the MHS category. When discussing a single category, CBO included all costs therein to provide a complete picture for that activity. CBO corrected for that double counting when discussing combined costs of the O&S categories.

Cash compensation (including accrual payments for military retirement) constitutes the largest of the three components in the 2016 budget request, accounting for more than half of the requested appropriation for O&S. Funding for compensation comes from the appropriations for military personnel and for O&M. The MHS is also funded largely from O&M appropriation accounts, but the military personnel who work in the MHS are paid from the military personnel appropriation. The third category, other O&M costs, includes funding for the purchase of consumable items ranging from office supplies to aircraft fuel but excludes funding for major equipment, such as ships, tanks, aircraft, missiles, and ammunition, which are purchased through the procurement accounts. It also includes the purchase of services, such as contracts

**Figure 2-2.****The Components of DoD's Base Budget for Operation and Support, as Analyzed by CBO**

Source: Congressional Budget Office.

Note: DoD = Department of Defense.

with private entities to maintain facilities, prepare food, repair weapon systems, operate information systems, and conduct many other activities.

CBO estimated costs for cash compensation and medical care in a “bottom-up” manner by combining estimates of the numbers of people who will receive cash compensation and be eligible for medical care, enrollment and participation rates in different health care plans, and various factors relating to cost and prices. Such estimates were not possible for the third component of O&S costs because of the wide array of goods and services purchased. Consequently, for those costs, CBO used DoD’s estimates through 2020 and projected costs from 2021 to 2030 on the basis of DoD’s historical experience, with adjustments for changes in the size of the military force.

The size of the military force is a factor that contributes directly to all three major categories of O&S costs. The primary way in which DoD measures the size of its force is in terms of end strength—the number of military personnel on the rolls as of the final day of the fiscal year. DoD’s plans include its projections of end strength for each service’s active and reserve components and each fiscal year within the FYDP period. Lawmakers, via the annual National Defense Authorization Act, place limits on end strength that may or may not be consistent with DoD’s plan.

Relative to 2015 levels, DoD’s 2016 plan would shrink the total size of its force by 3 percent between 2015 and 2020—a decrease in end strength of about 37,000 people in the active force and about 19,000 in the reserve and National Guard components (see Table 2-1). Almost all of the reduction in end strength under DoD’s 2016 plan would occur in the Army. From 2015 to 2020, the Army’s active-duty end strength would drop from 490,000 to 450,000 (a decrease of 8 percent), the Army Reserve’s from 198,000 to 195,000 (2 percent), and the Army National Guard’s from 350,000 to 335,000 (4 percent). However, the Army has indicated that if it is held to budget appropriations consistent with the Budget Control Act caps in effect through the end of the FYDP period, it will have to further cut end strength by 2020: to 420,000 in the active component (an additional reduction of 30,000 soldiers, or 7 percent), 185,000 in the Army Reserve, and 315,000 in the Army National Guard (together, an additional reduction of 30,000 soldiers, or 6 percent, in the reserve components).<sup>2</sup>

### **Pay, Cash Benefits, and Accrual Payments for Retirement Benefits**

The Administration’s 2016 budget request included \$201 billion in O&S funding for pay and benefits for DoD’s military personnel and most of its civilian

2. Department of the Army, *Fiscal Year 2016 Army Budget Overview* (February 2015), p. 19, <http://go.usa.gov/cnUgR>.

**Table 2-1.****DoD's Plans for the Number of Military Personnel, 2015 to 2020**

Thousands of Personnel

	2015	FYDP Period					Change in Personnel From 2015 to 2020	
		2016	2017	2018	2019	2020	Thousands	Percent
<b>Army</b>								
Active Force	490	475	460	450	450	450	-40	-8
Reserves	198	198	195	195	195	195	-3	-2
National Guard	350	342	335	335	335	335	-15	-4
<b>Navy</b>								
Active Force	324	329	327	328	330	330	6	2
Reserves	55	56	56	57	57	57	2	3
<b>Marine Corps</b>								
Active Force	184	184	182	182	182	182	-2	-1
Reserves	41	41	40	40	40	40	-1	-2
<b>Air Force</b>								
Active Force	313	317	314	313	311	311	-2	-1
Reserves	67	69	67	67	67	67	-1	-1
National Guard	105	106	104	104	104	104	-1	-1
<b>DoD Totals</b>								
Active Force	1,311	1,305	1,283	1,273	1,273	1,273	-37	-3
Reserves	362	364	358	359	359	359	-3	-1
National Guard	455	448	439	439	439	439	-16	-4
Total Force	2,127	2,116	2,080	2,071	2,071	2,071	-56	-3

Source: Congressional Budget Office based on data from DoD.

Notes: DoD measures the size of its force in terms of end strength—the number of military personnel on the rolls as of the final day of a fiscal year.

DoD = Department of Defense; FYDP = Future Years Defense Program.

employees. About \$137 billion of that total is in the appropriation for military personnel, which supports DoD's active-duty service members and planned training activities for reserve and National Guard members (but not their potential activations for overseas conflicts, which are funded outside of the base budget). CBO estimates that an additional \$64 billion to compensate most of DoD's civilian workers will come from O&M funding.<sup>3</sup>

DoD projects that annual costs to compensate military and civilian personnel will decline to about \$195 billion (in 2016 dollars) in 2020 (see Table 2-2). That change

3. Compensation for some civilian employees—about \$7 billion in 2016, CBO estimates—is paid from other appropriations and not included in the totals for O&M. For instance, some civilians in military laboratories are paid from the appropriation for research, development, test, and evaluation, and some civilians in acquisition program offices are paid from the appropriation for procurement.

reflects a combination of the planned reductions in personnel levels and planned growth in pay below the projected rate of inflation. CBO estimates that, beyond the FYDP period, compensation costs would grow by an average of 1.1 percent per year in real terms and reach \$218 billion in 2030. That increase is based on the assumptions that personnel levels would not change after 2020 and that both military and civilian pay will increase after 2020, apace with CBO's forecast of the growth rate in the Bureau of Labor Statistics' employment cost index (ECI). Combining DoD's estimates for 2016 through 2020 with CBO's extension of those estimates for 2021 through 2030 yields an increase in costs in this category of 0.6 percent per year, on average, from 2016 through 2030 (excluding the effects of inflation).

**Compensation for Uniformed Service Members**

Pay, cash benefits, and retirement accruals for military service members are funded through the appropriation

**Table 2-2.****Operation and Support Costs in DoD's Base Budget, 2016 and 2020**

Billions of 2016 Dollars

	2016	2020
Military Personnel		
Military personnel in the Military Health System	9	8
TRICARE for Life accrual payments	6	7
Other military personnel	<u>122</u>	<u>118</u>
<b>Total</b>	<b>137</b>	<b>133</b>
Operation and Maintenance		
Civilian personnel		
Civilian personnel in the Military Health System	5	5
Other civilian personnel	<u>59</u>	<u>57</u>
Subtotal	64	62
Other Operation and Maintenance		
Other operation and maintenance in the Military Health System	27	29
Other operation and maintenance outside the Military Health System <sup>a</sup>	<u>121</u>	<u>124</u>
Subtotal	147	152
<b>Total</b>	<b>212</b>	<b>214</b>
<b>Total Appropriations for Operation and Support</b>	<b>348</b>	<b>347</b>
<b>Memorandum:</b>		
Military Health System		
Military personnel in the Military Health System	9	8
TRICARE for Life accrual payments	6	7
Civilian personnel in the Military Health System	5	5
Other operation and maintenance in the Military Health System	<u>27</u>	<u>29</u>
<b>Total<sup>b</sup></b>	<b>47</b>	<b>49</b>
Compensation <sup>c</sup>		
Military personnel	137	133
Civilian personnel	<u>64</u>	<u>62</u>
<b>Total<sup>d</sup></b>	<b>201</b>	<b>195</b>

Source: Congressional Budget Office.

Notes: DoD = Department of Defense.

- For this analysis, CBO folded appropriations for most revolving and management funds (such as the one for the Defense Commissary Agency) into the appropriations for operation and maintenance.
- These figures do not include MHS spending in accounts other than operation and support.
- Compensation consists of pay, cash benefits, and accrual payments for retirement benefits. For civilians, it also includes DoD's contributions for health insurance.
- These figures do not include compensation for civilian personnel funded from accounts other than operation and support.

for military personnel, which includes basic pay, reenlistment bonuses, food and housing allowances, and various other elements. Basic pay, which is determined by the service member's pay grade and years of service, is the single largest and most visible component of cash compensation. DoD's appropriation for military personnel is also charged for accrual payments to the Military Retirement Fund; those payments are calculated to account for future

retirement benefits to current military personnel. (Health care benefits available to service members and their families through the MHS are considered in the next section of this chapter.)

Since 2004, growth in the ECI for private-sector wages and salaries has provided a statutory benchmark for the adjustment to the rates of military basic pay that takes

place at the start of each calendar year.<sup>4</sup> For calendar years 2004 through 2006, the pay raise was stipulated as equal to the recent annual percentage increase in the ECI plus 0.5 percentage points. For calendar year 2007 and after, the law has set the pay raise equal to the recent percentage increase in the ECI without the additional 0.5 percentage points, unless that raise is overridden by the Congress.<sup>5</sup>

For military pay raises during the FYDP period, DoD's 2016 plan includes increases that would fall short of the department's forecasts of the growth rate of the ECI through 2020. For calendar year 2016, DoD requested a pay raise of 1.3 percent for military personnel—one percentage point below the ECI benchmark; that raise was approved by lawmakers. DoD's 2016 plan also includes raises of 1.3 percent for calendar year 2017, 1.5 percent for calendar years 2018 and 2019, and 1.8 percent for calendar year 2020. Although DoD does not generally publish its forecasts of the ECI, the department's budget documentation for 2016 states its intention to continue capping pay raises below the percentage increases in ECI: "In addition, outyear pay raise planning factors currently assume limited pay raises will continue through FY 2020 ... the outyear pay raise assumptions are notional planning factors that the Department believes are necessary to live within current budgetary environment while maintaining a balanced force fully capable of executing its national security missions."<sup>6</sup> CBO's estimate for years beyond 2020 is based on the assumption that military pay raises would equal its forecast of the percentage increases in the ECI (the default outcome as stipulated in current law) from 2021 through 2030.

DoD's budget submission for 2016 did not suggest any changes to the military retirement system. However, under the 2013 NDAA, lawmakers chartered the Military Compensation and Retirement Modernization Commission (MCRMC) to study the issue. In January 2015, the commission reported its recommendations, which would change the current defined-benefit plan in several ways,

including adding a defined-contribution component that would have participants contribute to their own retirement saving and changing the rules for vesting in the system.<sup>7</sup> The 2016 NDAA changes the military retirement system by incorporating many of the MCRMC's recommendations but with some variations. Elsewhere, CBO has published estimates of the effects of the retirement provisions on federal outlays and revenues.<sup>8</sup> Because DoD did not anticipate Congressional action on the military retirement system when formulating its 2016 FYDP, the FYDP does not reflect any changes in federal spending associated with retirement reform; nor does CBO's extension of the FYDP through 2030. In its cost estimate for the legislation, CBO projected that those changes to the retirement system would reduce DoD's need for appropriations by an average of \$1.7 billion a year over the 2018–2025 period.

### Compensation for DoD's Civilian Employees

DoD also employs roughly 800,000 full-time-equivalent civilian employees, most of whom are paid from the O&M appropriation. DoD's 2016 plan includes increases in the wages and salaries of civilian employees equal to those requested for military personnel for all years spanned by the FYDP. CBO's estimate beyond 2020 is based on the assumption that civilian pay raises would match those for military personnel and track with the percentage increases in the ECI after 2020. Consequently, the military and civilian pay raises would, in percentage terms, equal each other in every year of the projection period.

### The Military Health System

More than 9 million people are eligible for health care through the Military Health System; health benefits are provided by DoD's TRICARE program, which is administered by the MHS. Eligible beneficiaries as of 2015 included 1.7 million military personnel from active components or activated members of the reserves or National Guard, 2.4 million family members of those personnel, and 5.4 million military retirees and their family members.

Beneficiaries may seek free or subsidized care from military treatment facilities, regional networks of civilian providers

4. Section 602 of the National Defense Authorization Act for Fiscal Year 2004.

5. 37 U.S.C. 1009 (adjustments of monthly basic pay) states that the percentage increase in basic pay for a given calendar year is equal to the percentage increase in the ECI for private-sector wages and salaries from the third calendar quarter three years before the effective date of the pay raise to the third calendar quarter two years before the effective date.

6. Department of Defense, *Fiscal Year 2016 Budget Request: Overview* (February 2015), p. 6-6, <http://go.usa.gov/3JgYd>.

7. Military Compensation and Retirement Modernization Commission, *Final Report* (January 29, 2015), pp. 19–41, [www.mcrmc.gov/public/docs/report/mcrmc-finalreport-29jan15-LO.pdf](http://www.mcrmc.gov/public/docs/report/mcrmc-finalreport-29jan15-LO.pdf) (4.1 MB).

8. Congressional Budget Office, cost estimate for H.R. 1735, sections 631–635, as cleared by the Congress on October 7, 2015 (October 14, 2015), [www.cbo.gov/publication/50893](http://www.cbo.gov/publication/50893).

under contract with TRICARE, or other civilian providers. DoD also manages TRICARE for Life, a program that the Congress authorized in the 2001 NDAA to supplement Medicare for beneficiaries eligible for both Medicare and military health benefits.<sup>9</sup>

This report does not consider the costs of the health care or other benefits provided to veterans by the Department of Veterans Affairs (VA). The Consolidated Appropriations Act, 2016, provided \$169 billion for that department in 2016, including \$62 billion to treat approximately 6.9 million patients during that year. Other VA benefits include monthly cash payments that compensate for service-connected disabilities and GI Bill benefits that reimburse some of the costs of higher education.<sup>10</sup> Although TRICARE benefits are available to all of the roughly 2 million retired service members—most of whom served for 20 years or more—and their eligible family members, VA benefits are potentially available to the much larger population of 22 million veterans who received honorable or general discharges from their (typically shorter) military service.

DoD requested \$47 billion in O&S funding for the MHS in 2016, about 9 percent of the total funding requested for the department's base budget.<sup>11</sup> (The appropriation appears to be consistent with the request.) Under DoD's assumptions for the FYDP period, the costs (in 2016 dollars) of the MHS would reach \$49 billion by 2020. Extending DoD's estimate, CBO calculated that those costs would reach \$64 billion by 2030 if their growth reflects anticipated national trends in health care costs (see Figure 2-3). The implied growth rate—2.3 percent annually, on average, from 2016 through 2030, excluding the effects of inflation—would be considerably higher than the rate that CBO estimates for the other two major categories within O&S. Moreover, DoD's projections incorporate savings

from some proposed changes to TRICARE, most of which the Congress rejected in the 2016 NDAA.

### Major Budget Categories in the Military Health System

DoD's budget documents delineate medical costs in five major categories:

- *Military personnel* covers the costs of pay and benefits for uniformed personnel assigned to work in the MHS. Those costs are included in CBO's tally of the total cost of the MHS, but they are counted only once in CBO's projection of overall O&S costs (see Table 2-2 on page 21).<sup>12</sup>
- *Direct care and administration* covers the operation of military medical facilities and administrative and training activities. The category includes pay and benefits for civilian personnel assigned to work in those facilities but excludes pay and benefits for military personnel who work in those facilities (those costs are counted in a previous category).
- *Purchased care and contracts* covers medical care delivered by providers in the private sector, both inside and outside of the TRICARE network.
- *Pharmaceuticals* covers the costs of purchasing medicines dispensed at military medical facilities, at pharmacies inside and outside of DoD's network, and through DoD's mail-order pharmacy program.
- *TRICARE for Life accrual payments* covers funds included in DoD's military personnel appropriation and credited to the Medicare-Eligible Retiree Health Care Fund. Outlays from that fund are used for two purposes: to reimburse military medical facilities for care provided to military retirees and their family members who are also eligible for Medicare, and to cover most of the out-of-pocket costs that those beneficiaries would otherwise incur when seeking care from private-sector Medicare providers. (Those accrual payments are included in both the cost of military personnel and in CBO's tally of the total cost of the MHS, but they are counted only once in CBO's projection of overall O&S costs.)

9. For more on the military health system, see Congressional Budget Office, *Approaches to Reducing Federal Spending on Military Health Care* (January 2014), [www.cbo.gov/publication/44993](http://www.cbo.gov/publication/44993).

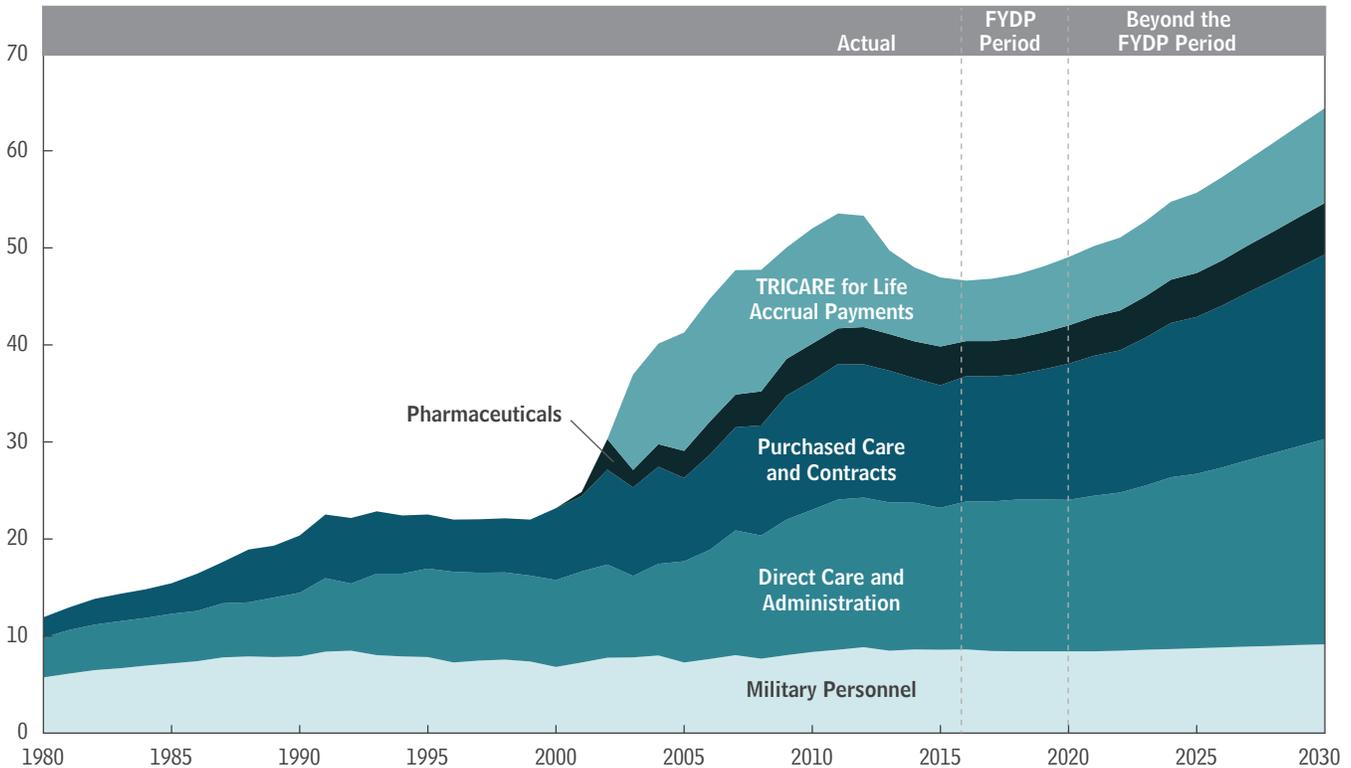
10. For more on VA's disability compensation program, see Congressional Budget Office, *Veterans' Disability Compensation: Trends and Policy Options* (August 2014), [www.cbo.gov/publication/45615](http://www.cbo.gov/publication/45615).

11. Neither DoD's request of \$47 billion in O&S funding nor CBO's projection of O&S costs includes the relatively small amounts that the MHS is provided for procurement, military construction, and research, development, test, and evaluation (which together total \$2 billion in DoD's request for 2016). Those costs are included in CBO's estimates for the corresponding appropriation totals in the following chapters.

12. For example, the same \$9 billion of funding for military personnel in the MHS in 2016 appears twice in Table 2-2, once under the military personnel appropriation and again as part of the cost of the Military Health System.

**Figure 2-3.****Costs of DoD's Plans for Its Military Health System**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is included for 2015 and earlier but not for later years.

Before 2001, pharmaceutical costs were not separately identifiable but were embedded in the costs of two categories: "Purchased Care and Contracts" and "Direct Care and Administration." In 2001 and later years, most pharmaceutical costs are separately identifiable, but some of those costs are embedded in the category "TRICARE for Life Accrual Payments."

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified.

The costs of the MHS may be organized in various ways depending on the purpose of the analysis. One way is to extract the costs of civilian personnel from the accounts for direct care and administration in order to highlight the respective costs of military and civilian personnel in the MHS and elsewhere in DoD's base budget (see Table 2-2 on page 21). However, in CBO's assessment, more useful projections can be generated by using an allocation of costs that corresponds to the functions performed by the MHS rather than to the budgetary accounts through which the system is funded.

Therefore, CBO projects the costs of the MHS in three categories: military personnel; TRICARE for Life accrual

payments; and the combination of direct care and administration, purchased care and contracts, and pharmaceuticals. The last set of components are grouped because they tend to be driven by common factors such as the number of beneficiaries in the TRICARE program and cost trends in the nation's health care system as a whole.

Military retirees and their families generally pay much less for health care than do comparable civilian families.<sup>13</sup> DoD estimated that in 2014, a typical military retiree

13. See Congressional Budget Office, *Approaches to Reducing Federal Spending on Military Health Care* (January 2014), pp. 13–15, [www.cbo.gov/publication/44993](http://www.cbo.gov/publication/44993).

could enroll his or her family in TRICARE Prime (the TRICARE option most similar to a health maintenance organization, or HMO) for \$550 per year and would, on average, pay another \$440 in copayments and other fees for a total annual cost of \$990. In contrast, DoD estimated that in 2014, a civilian in the general U.S. population who enrolled in a family HMO plan offered by an employer would typically pay \$4,745 as the employee's share of the annual premium. With deductibles and copayments averaging \$1,150, that family would pay a total of \$5,895 over the course of the year. Thus, the family enrolled in a civilian HMO would pay six times what a similar family would pay for coverage in TRICARE Prime. On the basis of a parallel calculation, DoD estimated that a family who used a civilian preferred-provider organization (PPO) would pay more than five times what a similar military family would pay for coverage in TRICARE Standard (which operates as a traditional fee-for-service plan) or Extra (which operates as a PPO).<sup>14</sup>

As a result of those differences in costs, a rapidly growing share of military retirees and their families are relying on TRICARE rather than participating in health insurance provided by civilian employers or purchasing insurance on their own. In 2002, about 43 percent of military retirees signed up for private health insurance, but by 2014, that figure had dropped to 19 percent, implying greater reliance on TRICARE.<sup>15</sup> In addition, low out-of-pocket costs and other factors have led to higher rates of use for inpatient and outpatient care among enrollees in TRICARE Prime than DoD has reported for comparable civilians enrolled in HMOs.<sup>16</sup>

### DoD's Proposed Changes to TRICARE

In order to reduce the rate of growth of its health care costs, DoD's 2016 budget included the following proposed changes to the TRICARE benefit, implementation of which would begin in 2016 and be completed by 2020:

- Replace TRICARE Prime, Standard, and Extra (the "triple option" for which TRICARE was originally

named) with a single, consolidated plan for family members of active-duty service members and for retirees and their family members who are not eligible for Medicare (a consolidated plan would require generally higher deductibles and copayments than the current triple option);

- Introduce new fees for active-duty family members to discourage them from using emergency department care in situations that are determined to be inappropriate;
- Institute an annual fee for military retirees who are newly eligible for Medicare and who enroll in TRICARE for Life (the fee would not be charged to retirees who are already participating in TRICARE for Life); and
- Raise copayments for pharmaceuticals beyond the increases that were enacted in the 2015 NDAA as further incentives for beneficiaries to use drugs judiciously.<sup>17</sup>

DoD estimated that those changes would increase O&M costs in 2016, the first year of implementation, by \$69 million, with costs for program consolidation overshadowing savings from increasing pharmacy and other fees. The department would also save \$398 million in TRICARE for Life accrual payments (from the military personnel appropriation) in that first year.<sup>18</sup> As the policy changes were implemented over the period from 2016 to 2020, savings would accumulate to \$3.2 billion in O&M costs and \$2.1 billion in accrual payments. Those savings are incorporated into DoD's estimates of costs in the

14. See Department of Defense, *Evaluation of the TRICARE Program—Access, Cost, and Quality: Fiscal Year 2015 Report to Congress* (February 2015), pp. 94 and 96, <http://go.usa.gov/3JYhB>.

15. *Ibid.*, p. 93.

16. *Ibid.*, pp. 78–79.

17. Department of Defense, *Fiscal Year 2016 Budget Request: Overview* (February 2015), pp. 6-7 to 6-8, 6-11 to 6-15, <http://go.usa.gov/3JgYd>. The 2015 NDAA allowed a \$3 increase in retail and mail-order pharmacy copayments and required refills for maintenance drug prescriptions (such as those that control cholesterol or blood pressure) to be filled at military treatment facilities or through mail order.

18. In a cost estimate for legislation (such as an NDAA that would authorize those changes), CBO would not generally credit the \$398 million savings in accrual payments in the first year. The reason is that, with NDAs often not being enacted until well into the first quarter of the fiscal year to which they apply, the DoD's Office of the Actuary would have difficulty computing the new accrual rates in time for application until the following year. However, CBO includes those savings in this report because they are built into DoD's FYDP.

FYDP. However, among other differences between DoD's plan and the 2016 NDAA as enacted, the Congress rejected most of DoD's proposed changes to the TRICARE benefit, except for a modest one-time increase to pharmacy copayments.<sup>19</sup> If the Congress continues such rejections in future years, most of DoD's planned savings in MHS costs will not be realized.

### Projected Costs for the Military Health System

Extending DoD's estimate, CBO's estimate for pay and benefits of military personnel who work in the Military Health System (and who are paid from the military personnel appropriation) is based on the same series of annual increases as for all other military personnel (discussed above). Compensation for military personnel who work in the MHS is not a major contributor to the overall increase in costs that CBO projects for the MHS because it is smaller than most of the other major categories and is projected to grow more slowly.

In extending DoD's estimates of the costs of direct care and administration, purchased care and contracts, and pharmaceuticals, CBO used the estimates from DoD's FYDP for the years 2016 through 2020. CBO projects that, after 2020, the costs per beneficiary in those three categories would grow at the same rate that CBO projects for health care costs nationwide (apart from the Medicare program, which differs in important ways from the rest of the health care system).<sup>20</sup> Over the 2016–2030 period, the projected real annual growth in costs per beneficiary averages 2.4 percent for direct care and administration, 2.8 percent for purchased care and contracts, and 2.9 percent for pharmaceuticals.<sup>21</sup>

For TRICARE for Life accrual payments (also paid from the military personnel appropriation), CBO's projection

is derived from data provided by DoD's Office of the Actuary. That office's projection implies that accrual payments per service member would grow at an average annual rate of about 3 percent (after removing the effects of inflation) between 2016 and 2030.

### Other Operation and Maintenance Costs

The remainder of O&S spending is for what CBO refers to as other O&M—the portions of operation and maintenance other than those involving the Military Health System and compensation for DoD's civilians. CBO also included appropriations for most revolving and management funds in the other O&M category. Other O&M costs per active-duty service member have grown steadily since 1980; costs in the category would increase by an annual average of 1.0 percent from 2016 through 2030 under DoD's estimates in the FYDP and CBO's extension of those estimates thereafter.

Because a diverse array of functions contribute to other O&M costs, it was not practical for CBO to build an estimate beyond the FYDP period from the bottom up—that is, to develop estimates for the costs of the various components involved and then add those estimates, as CBO did for the projections of the costs of compensation and military health care. Instead, CBO used a top-down approach to project other O&M costs for the years beyond the FYDP period.

Within the FYDP period, DoD estimates that other O&M costs would increase from \$121 billion in 2016 to \$125 billion in 2018 before edging down to \$124 billion in 2020, an average growth of 0.5 percent per year in real terms. CBO projected other O&M costs beyond the FYDP period using the historical trend in the growth of those costs per active-duty service member: from 1980 to 2001, about \$1,100 per person per year in 2016 dollars. By that method, CBO estimates that other O&M costs would reach \$138 billion in 2030, growing at a rate of about 1.1 percent annually after 2020. (See Box 2-1 for a discussion of how O&M costs have grown over the years.)

The sources of historical growth in other O&M costs cannot be readily determined from aggregate data; that growth could have been caused by a number of factors.

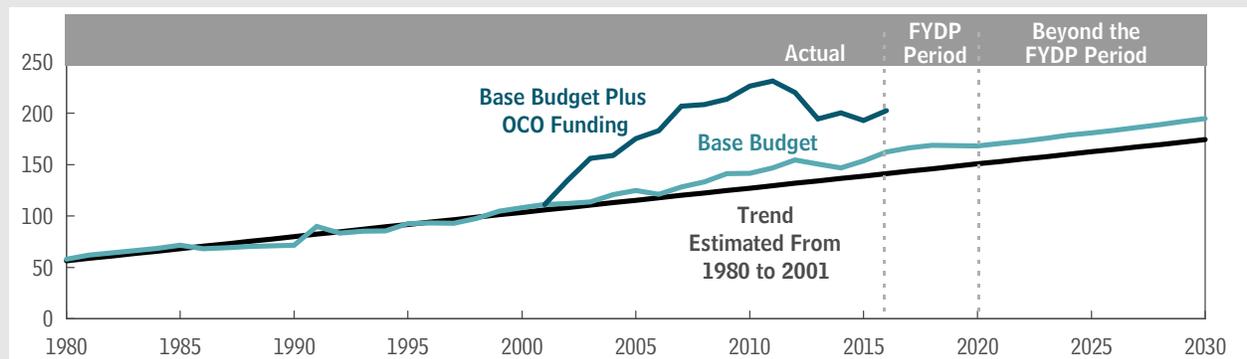
19. National Defense Authorization Act for Fiscal Year 2016, section 702.

20. See Congressional Budget Office, *The 2015 Long-Term Budget Outlook* (June 2015), pp. 40–41, [www.cbo.gov/publication/50250](http://www.cbo.gov/publication/50250).

21. In nominal terms, those average annual growth rates for the 2016–2030 period are 4.5 percent for direct care and administration, 4.9 percent for purchased care and contracts, and 5.0 percent for pharmaceuticals. The calculation of the growth rate for pharmaceuticals excludes some pharmacy costs that are not paid directly from O&M appropriations but are embedded in the accrual payments for TRICARE for Life.

**Box 2-1.****Comparing Historical and Projected Growth in Spending per Service Member for Operation and Maintenance****Costs of Operation and Maintenance per Active-Duty Service Member**

Thousands of 2016 Dollars



Source: Congressional Budget Office.

Notes: Base-budget data include supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown separately from the base-budget data. No OCO funding is shown for 2017 and later.

FYDP = Future Years Defense Program; FYDP Period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

Appropriations for operation and maintenance (O&M) fund the day-to-day operations of the military, including equipment maintenance, training, civilian compensation, and most of the costs for military health care. O&M costs per active-duty service member have increased rapidly in the past and are projected to continue to do so in both the Department of Defense's Future Years Defense Program (FYDP) and the Congressional Budget Office's extension of that plan through 2030.

From 1980 to 2001 (the last year before the onset of major combat operations in Afghanistan and Iraq), O&M costs per active-duty service member nearly doubled, from \$58,000 to \$111,000, after removing the effects of inflation (measured in 2016 dollars; see the figure). Notably, the cost per active-duty service member grew at a roughly constant rate of \$2,500 a year (excluding the effects of inflation) despite broad shifts in defense policy, such as the military buildup of the 1980s and the reduction in forces at the end of the Cold War.

The overseas operations that began after 2001, funded largely through supplemental and emergency appropriations and not through the base budget, caused rapid growth in O&M costs. O&M funding per active-duty service member quickly departed from the historical trend as a result of the cost of conducting major operations, the wear and tear on equipment in combat, and the large number of reserve and National Guard personnel

deployed. (Because CBO's calculation involved dividing all O&M costs by the number of active-duty service members, supporting more deployed reserve and National Guard personnel increased the O&M cost per active-duty service member.) By 2010, O&M costs per active-duty service member had doubled again, reaching \$226,000 (in 2016 dollars), including costs for overseas contingency operations.

Even without the large growth in O&M funding to support operations in Afghanistan and Iraq, O&M costs in the base budget have grown faster than the historical trend. By 2015, the O&M cost per active-duty service member in the base budget was \$153,000 (in 2016 dollars), about \$14,000 (or 10 percent) above what is implied by the trend between 1980 and 2001.

During the period described in the 2016 FYDP, O&M costs per active-duty service member are estimated by the Department of Defense to increase by an average of only \$1,500 per year, from \$162,000 in 2016 to \$168,000 in 2020—a rate significantly below the historical trend. CBO's projection of O&M costs beyond the FYDP period is based on explicit estimates for civilian compensation and for the Military Health System and on the historical trend for other O&M. In CBO's projection, annual growth averages \$2,600 per active-duty service member, slightly higher than the historical trend for all of O&M.

For example, DoD may have increased its hiring of contractors over time—using O&M funds—to provide services and functions that did not exist in earlier years or that had previously been provided by military personnel. Additionally, the costs to operate and maintain weapon systems may have increased. Since the 1990s, the rate of replacement of weapon systems has been slower than it was previously, and that has resulted in increased average ages for many types of weapons in use today. That factor may contribute to the increase observed in O&M costs because older weapon systems can be more costly to maintain as they age, particularly as they approach the end of their service lives. In addition, when an older weapon system is replaced by a more modern weapon system, the more modern system may be more expensive to operate early in its service life than was its predecessor because the more modern system has greater capability and technical complexity. That may result in upward pressure on O&M costs across generations of weapon systems. Still other factors, more difficult to identify, may have contributed to the growth in other O&M costs.

### Why O&S Costs Could Be Higher Than DoD Estimates

In extending DoD's projection of O&S costs beyond the FYDP period, CBO used DoD's estimate of costs in 2020 as the starting point and, for subsequent years, used cost assumptions that are based on DoD's estimates when available or estimates of costs for the general economy where DoD estimates are not available. For example, the calculation of costs for military pay is based on DoD's planning assumptions for 2016 through 2020 and on CBO's forecast of the ECI of the general economy for 2021 through 2030.

In the past, however, DoD has misestimated the prices of various elements of its plans or has not been permitted by the Congress to implement some of the policies that underpin its budget submission and associated cost estimates. As a result, the O&S costs of DoD's plans have often turned out to be different (usually higher) than it anticipated.

CBO examined the effect that different prices or policies related to O&S activities might have on the total funding needed to implement DoD's current plans through 2030. That analysis focuses on four areas that have historically seen differences between DoD's planned costs and policies and those that were actually realized:

- Military pay raises,
- Civilian pay raises,
- Military health care, and
- Other operation and maintenance.

To illustrate the effects of such differences on outcomes, CBO prepared alternative estimates of O&S costs under different assumptions (see Table 2-3).

### Military Pay Increasing With ECI Instead of DoD's Planned Rate

According to DoD's plans, pay raises for uniformed service members through 2020 would be lower than the percentage increases in the ECI over that period. Under current law, military pay raises are benchmarked to the ECI unless a different change is approved in legislation for a particular budget year. Because of the fiscal constraints of the Budget Control Act of 2011, pay raises over the past few years have been lower than the ECI benchmark. The 10 annual pay raises that took effect between calendar years 2001 and 2010, however, all exceeded the corresponding percentage change in the ECI by at least 0.5 percentage points. For example, for calendar years 2007 through 2010, DoD requested a pay raise equal to the percentage increase in the ECI (the value that would have prevailed by default without Congressional action), but lawmakers added 0.5 percentage points to that increase. For calendar years 2011 through 2013, DoD continued to request pay raises equal to the recent percentage increases in the ECI, and those raises were enacted without enhancement. In calendar years 2014 and 2015, the ECI benchmark was 1.8 percent, but DoD requested and lawmakers enacted pay raises of only 1.0 percent. Finally, for 2016, DoD requested a pay raise of 1.3 percent—a full percentage point below the ECI benchmark of 2.3 percent; that raise was approved by the Congress.

CBO examined the implications of military pay raises returning to the pace of the ECI. That policy could be enacted in future years for two reasons: First, the ECI remains the statutory benchmark for the military pay raise as established in 2007. Second, despite both positive and negative deviations from that benchmark, the average pay raise for military personnel from 2007 through 2015 matched the average percentage increase in the ECI over that period. CBO prepared an alternative projection of

**Table 2-3.****Changes in Operation and Support Costs Relative to the FYDP Under Alternative Policy or Cost Assumptions**

Billions of 2016 Dollars

	Average Annual Increase		Total Increase		
	2016- 2020	2021- 2030	2016- 2020	2021- 2030	2016- 2030
<b>Areas in Which Different Policies May Be Adopted</b>					
Increase Military Pay at the Rate of the ECI Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	2.7	6.1	13.4	60.5	73.9
Increase Civilian Pay at the Rate of the ECI Minus 0.6 Percentage Points (Average Since 2007) Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	1.0	2.4	5.0	24.0	29.0
Increase Civilian Pay at the Rate of the ECI Instead of the Lower Rate Assumed by DoD for 2017 Through 2020	1.2	2.6	5.8	26.3	32.1
Do Not Implement DoD's Proposals to Consolidate TRICARE Plans and Increase Various Fees	0.6	1.0	3.0	10.4	13.3
Do Not Implement DoD's Proposal to Institute TRICARE for Life Annual Enrollment Fees	0.1	0.1	0.4	1.0	1.4
Fund Military Construction at Historical Levels (Adjusted for Force Size)	1.9	0	9.4	0	9.4
<b>Areas in Which Costs Could Be Higher</b>					
O&M Costs (Adjusted for Force Size) Grow as They Have in the Past	0.5	3.3	2.7	33.0	35.7

Source: Congressional Budget Office.

Note: DoD = Department of Defense; ECI = employment cost index for wages and salaries in the private sector, as reported by the Bureau of Labor Statistics; FYDP = Future Years Defense Program; O&amp;M = operation and maintenance.

military pay that differs from DoD's plan after 2016. In that alternative, the pay raise would track with CBO's forecast of ECI growth for each year from 2017 through 2020 (the remainder for the FYDP period) and through the end of CBO's projection in 2030. Under that assumption, costs (in 2016 dollars) for military compensation from 2016 to 2020 would be \$13 billion higher than indicated in the FYDP and \$74 billion higher for 2016 through 2030 (see Table 2-3).

**Civilian Pay Increasing Faster than DoD's Planned Rate**

Unlike pay raises for military personnel, those for federal civilian workers are not linked in statute to the ECI. Over the 2007–2015 period, when the military pay raise has, on average, equaled the recent percentage increase in the

ECI, the civilian pay raise has averaged 0.6 percentage points less than that increase.

CBO examined two alternative projections for civilian pay raises. Under both alternatives, the civilian pay raise would equal 1.3 percent in 2016—the value for which DoD planned and that was implemented by executive order. The first alternative projection incorporates the assumption that recent history is repeated in the next few years; the civilian pay raise in each year from 2017 through 2020 is equal to the percentage increase in the ECI minus 0.6 percentage points, and starting in 2021, the civilian pay raise is equal to the full percentage increase in ECI without any reduction. The second alternative projection incorporates the assumption that there is parity between the civilian and military pay raises,

echoing the alternative projection in which military pay raises match CBO's forecast of ECI growth for 2017 through 2030. Under the first alternative projection, costs (in 2016 dollars) for civilian compensation would be \$5 billion higher than indicated in the FYDP from 2016 to 2020 and \$29 billion higher from 2016 through 2030 (see Table 2-3). Under the second alternative projection, the costs would be \$6 billion higher than indicated in the FYDP from 2016 to 2020 and \$32 billion higher from 2016 through 2030.

### Alternative Policies and Costs for the Military Health System

The FYDP indicates that spending for the MHS will grow at an average annual rate of 1.3 percent above the rate of inflation from 2016 to 2020. DoD's estimate incorporates the assumption that the Congress would adopt several proposals for reducing DoD's costs that were embedded in the department's 2016 budget submission. The Congress, however, has rejected similar or related proposals each year between 2007 and 2011 and again between 2013 and 2015.<sup>22</sup> In the 2016 NDAA, the Congress rejected DoD's most recent proposals to change the TRICARE benefit, except for a modest onetime increase to pharmacy copayments.<sup>23</sup> Because the department's other proposed changes were rejected—including consolidation of the three TRICARE plans, introduction of new fees for emergency department care, and new fees for enrolling in TRICARE for Life—CBO estimates that O&M costs (in 2016 dollars) will be higher than indicated in the FYDP by a total of \$3.0 billion from 2016 to

2020 and accrual payments for TRICARE for Life (paid from the military personnel appropriation) will be higher by \$420 million (see Table 2-3 on page 29).

If, in addition to rejecting the majority of DoD's most recent proposals for health care, lawmakers deviated from DoD's plan by having military pay raises match the growth rate of the ECI starting in 2017, the costs of the Military Health System would reach \$67 billion in 2030, the average annual growth rate from 2016 through 2020 would be 2.0 percent, and, over the projection period from 2016 through 2030, the annual growth rate would average 2.4 percent. In contrast, those figures would be \$64 billion, 1.3 percent, and 2.2 percent, respectively, in the FYDP and CBO's extension of it.

### The Effect of Other O&M Growing at Historical Rates

In the 2016 FYDP, after adjusting for the size of the military, projected costs for other O&M through 2020 grow at a rate significantly below the average observed over the previous 35 years and average about \$124 billion per year during the FYDP period. It is certainly possible to significantly curtail O&M costs for limited periods of time by, for example, deferring maintenance on weapon systems or base facilities. Such may have been the case in 2013 as the result of sequestration that year. Extended periods of underfunding, however, can result in degraded capabilities or facilities. If DoD cannot decrease growth in the category of other O&M, funding above amounts anticipated in the FYDP may be needed to avoid such degradations. To examine how much additional funding might be needed, CBO prepared an alternative projection on the basis of the assumption that costs for other O&M would grow at the higher historical rate over the entire projection period. Under that assumption, costs (in 2016 dollars) for other O&M from 2016 through 2020 would be \$3 billion higher than indicated in the FYDP and \$36 billion higher for 2016 through 2030.

22. For the legislative history through 2011 of cost-sharing proposals for TRICARE, see Congressional Budget Office, *Costs of Military Pay and Benefits in the Defense Budget* (November 2012), Appendix C, [www.cbo.gov/publication/43574](http://www.cbo.gov/publication/43574).

23. National Defense Authorization Act for Fiscal Year 2016, Section 702.

## Projections of Acquisition Costs

**A**cquisition funding is the sum of the appropriations for procurement and for research, development, test, and evaluation. Those appropriations are used for activities such as developing and purchasing new weapon systems and other major equipment, upgrading the capabilities or extending the service life of existing weapon systems, and researching technologies that might be used in future weapon systems. For 2016, the Administration requested \$178 billion for acquisition in the base budget: \$108 billion for procurement and \$70 billion for RDT&E. That amounts to one-third of its total request for the Department of Defense, excluding funding for overseas contingency operations (which this report does not address). For 2016, \$7.4 billion of the \$51 billion requested for OCO was for acquisition—almost entirely for procurement.<sup>1</sup> The Consolidated Appropriations Act, 2016, provided about \$3 billion (or 2 percent) more in total funding for acquisition (base budget plus OCO) than the amount requested by the Administration but did not make significant changes to DoD's Future Years Defense Program.

The Congressional Budget Office analyzed DoD's estimates of the costs of its acquisition plans during the five years covered by the FYDP and extended those estimates another 10 years using DoD's estimates of costs as a basis. To do so, CBO assessed long-term funding for procurement and RDT&E, including the costs for more than 200 weapon systems and major upgrades to existing systems.

In DoD's estimation, the costs to implement its plans for acquisition would remain fairly steady over the period covered by the FYDP (see Figure 3-1). Although those costs would increase to \$181 billion (in real terms)

in 2017 and then gradually decrease to \$173 billion in 2020, the annual average over the FYDP period is very close to the \$178 billion requested for 2016. However, the distribution of costs within acquisition would shift somewhat over that period from RDT&E to procurement. By 2020, procurement funding would be about 2 percent higher and RDT&E funding 10 percent lower than the amount DoD requested for 2016. The distribution of costs for acquisition among the services would remain similar over time.

CBO's analysis indicates that the costs of DoD's acquisition plans will increase substantially in the years just beyond the FYDP period. Using the costs that DoD currently expects for its major weapons programs as a basis, CBO estimates that the costs of DoD's current acquisition plans would increase by 11 percent in the three years immediately after the FYDP period, reaching a peak of \$191 billion in 2023. Costs would gradually decline thereafter, to \$171 billion by 2030. In those later years, the department would have largely completed its current modernization programs. DoD has not, however, articulated plans for many modernization programs that might be needed toward the end of CBO's projection period. Although CBO's analysis included several such programs, the projected decline might not occur if DoD's modernization goals for the late 2020s are more extensive than those reflected in CBO's projections. The average annual cost for 2021 through 2030 would be 2 percent higher than the annual average over the FYDP period.

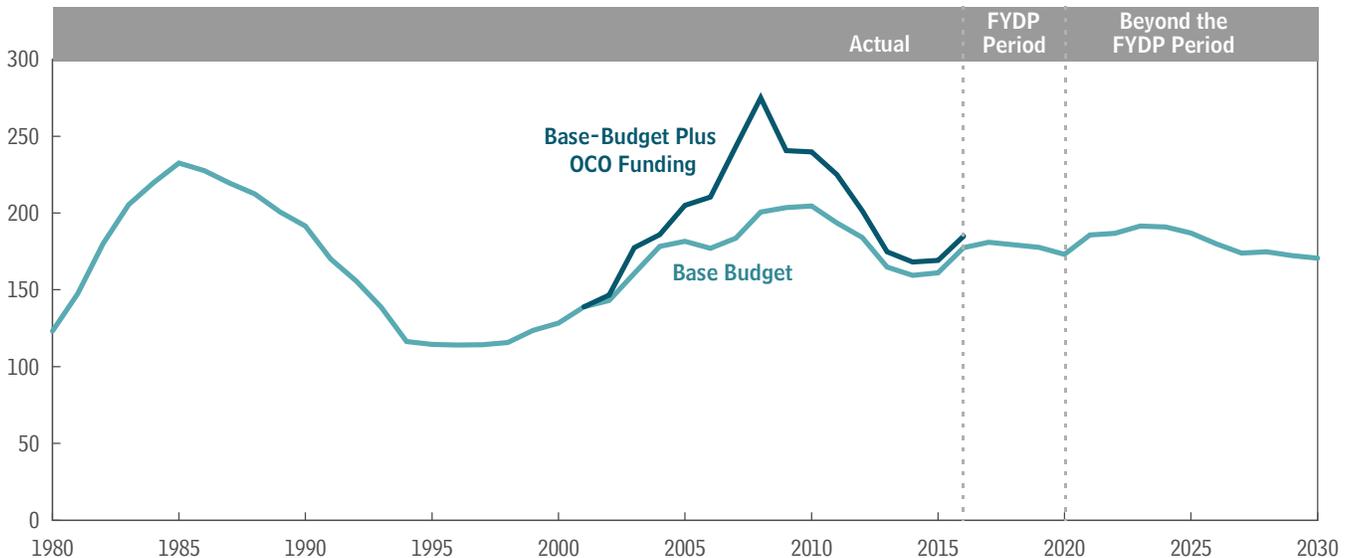
The funding that would be needed to implement current acquisition plans could be higher still if DoD's cost estimates for its programs prove to be low, as has frequently been the case in the past. CBO's analysis indicates that, if average acquisition costs follow the historical pattern, the total cost to implement DoD's acquisition plans would be 2.6 percent higher than it estimates for its plans over the FYDP period and 7.3 percent higher than an

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1. From 2001 to 2015, more than \$350 billion in OCO funds was appropriated for acquisition. Those funds have been used for a variety of purposes, including replacing equipment destroyed in battle and purchasing new types of equipment, such as mine-resistant vehicles, for use in Iraq and Afghanistan.

**Figure 3-1.****Costs of DoD's Acquisition Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Base-budget data include supplemental and emergency funding before 2002. For 2002 to 2016, supplemental and emergency funding for overseas contingency operations, such as those in Afghanistan and Iraq, and for other purposes is shown separately from the base-budget data. No OCO funding is shown for 2017 and later.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD's plans are fully specified; OCO = overseas contingency operations.

extension of DoD's estimates of costs would suggest from 2021 through 2030. The average annual cost for 2021 through 2030 would be about 7 percent higher than the annual average over the FYDP period.

**How CBO Projected Acquisition Costs**

Because developing and procuring a weapon system typically takes many more than the five years covered by the FYDP, substantial portions of DoD's acquisition plans extend well beyond that period. Although DoD provides some information about its longer-term plans (in, for example, documents such as selected acquisition reports and the Navy's 30-year shipbuilding plan), it does not provide a projection of what its total acquisition costs might be beyond the FYDP period.

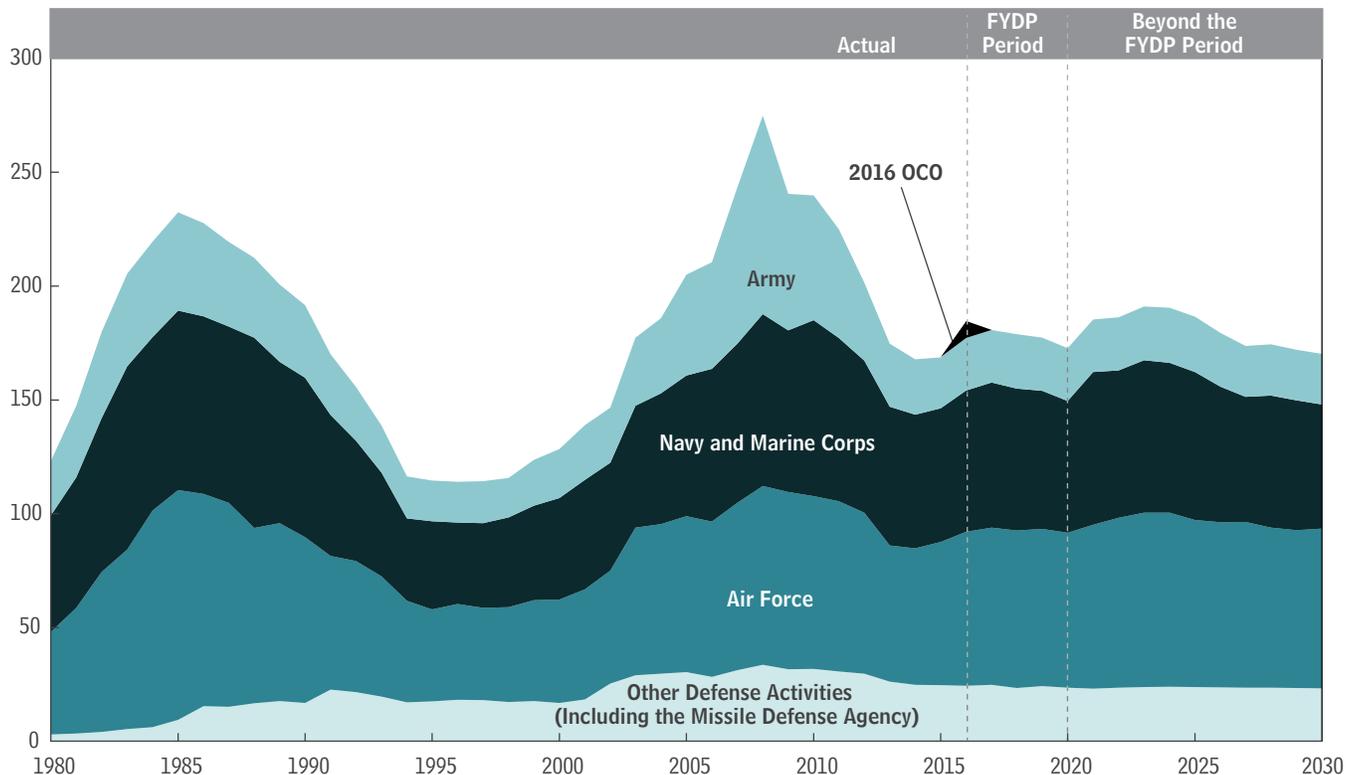
To project acquisition costs after 2020, CBO assessed the funding for various weapon systems or major upgrades to existing systems. Some of those systems are in or nearing production (for example, the Marine Corps CH-53K helicopter), and some are in the early planning stages (for example, a new long-range bomber for the Air Force).

Others (for instance, a replacement for the Navy's F/A-18E/F fighter) have no specific schedules but have been identified by the services or CBO as systems that would be necessary to maintain weapon inventories when today's systems reach the end of their service life and need to be replaced or as systems that would provide new capabilities to meet the goals described in the services' policy statements. Where possible, CBO used information from DoD to estimate the costs and schedules of future systems. In cases where no such information was available (for example, for systems that will not enter development until near the end of CBO's projection period), CBO based its cost estimates on the assumption that weapon systems being retired would be replaced with similar but technologically modern ones.

CBO grouped the procurement costs for those large programs into seven categories by the type of system: ground combat vehicles and trucks; ships; aircraft; missiles and munitions; missile defense systems; command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems; and space systems. The remaining procurement costs are grouped together as

**Figure 3-2.**  
**Costs of DoD’s Acquisition Plans, by Military Service**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each service category shows total funding (including that for overseas contingency operations) for 1980 to 2015 and planned base-budget funding from 2016 to 2030.

DoD = Department of Defense; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which DoD’s plans are fully specified; OCO = overseas contingency operations.

other procurement.<sup>2</sup> Funding shown in CBO’s specific categories does not include the other component of acquisition, RDT&E, which is shown separately as a single category. The total amounts for other procurement and for RDT&E were estimated by analyzing historical trends in overall acquisition funding and the relationship between total acquisition funding and the funding for large programs. CBO’s weapons categories are for illustrative purposes; how to assign specific systems to particular

categories is not always clear. For example, CBO does not show a separate C4ISR category for the Air Force because it placed most of that service’s extensive C4ISR investments in the aircraft and space systems categories instead.

### How Acquisition Costs Are Distributed Across the Services

The distribution of costs for acquisition among the services would remain about the same over the FYDP period (see Figure 3-2). The Army’s share of acquisition funding would be unchanged at 13 percent. The share for the Department of the Navy, which includes the Navy and Marine Corps, would fall by 1 percentage point by the end of the FYDP, from 35 percent in 2016 to 34 percent in 2020. The Air Force would receive the largest share of acquisition funding in 2016—38 percent of DoD’s total

2. Procurement costs in CBO’s categories of major weapon systems may not match those in the services’ corresponding appropriations accounts because CBO has focused on a subset of the larger programs contained in those categories and included the other, smaller programs in those categories under other procurement. For example, CBO’s aircraft category for the Army does not include all of the smaller aircraft-related programs that are funded through the Army’s appropriation account called aircraft procurement.

for the base budget.<sup>3</sup> That share would be 1 percentage point higher in the final year of the FYDP, according to DoD's estimates. The share allocated to defensewide activities would be about the same—around 14 percent—in 2016 and 2020.

Using DoD's estimates of costs as a basis, CBO projects that the Air Force's share of acquisition funding would climb slightly beyond the FYDP period, averaging 40 percent from 2021 through 2030. That increase in the Air Force's share results from decreases over that period for Army and defensewide acquisition. The Navy's portion would remain nearly unchanged. The increase in the Air Force's share results somewhat from that service's more fully defined plans to purchase several new systems in the next decade, whereas the Army's plans are currently focused on less-costly upgrades to existing systems, making it more difficult to project a comprehensive accounting of the next generation of Army systems that may emerge over that period.

### The Army

The Department of the Army's 2016 request for acquisition funding included \$23 billion in the base budget plus an additional \$2.1 billion for overseas contingency operations. According to DoD's estimates, acquisition costs for the Army's base budget would remain at about the 2016 level (adjusted for inflation) for the remainder of the FYDP period. Using DoD's estimates as a basis, CBO estimates that the Army's acquisition costs would remain fairly steady beyond the FYDP period, averaging just over \$23 billion through 2030.

For its analysis of post-FYDP procurement costs for the Army, CBO assessed the service's major existing programs and potential programs for the next decade. Those programs fell into five of CBO's seven system categories: ground combat vehicles and trucks, aircraft, missiles and munitions, missile defense systems, and C4ISR systems (see Figure 3-3). Funding for RDT&E is shown as a

separate category. Although costs for specific programs would vary from year to year depending on the details of each program, the relative shares of acquisition funding among the system categories would also be fairly steady.

As part of the basis for those projections, CBO analyzed various specific systems. For example, the years immediately after the FYDP period include continued funding to upgrade many of the Army's helicopters and continued purchases of UH-60M Blackhawk helicopters. In estimating costs toward the end of the projection period, CBO assumed that the Army would pursue a new scout helicopter and that a new transport aircraft program would grow out of current technology development efforts for the Joint Multi-Role Rotorcraft. Similarly, costs for ground combat vehicles include upgrades to existing vehicles at the beginning of the projection period as well as development of a replacement for the Bradley infantry fighting vehicle toward the end of the projection period.

### The Navy and Marine Corps

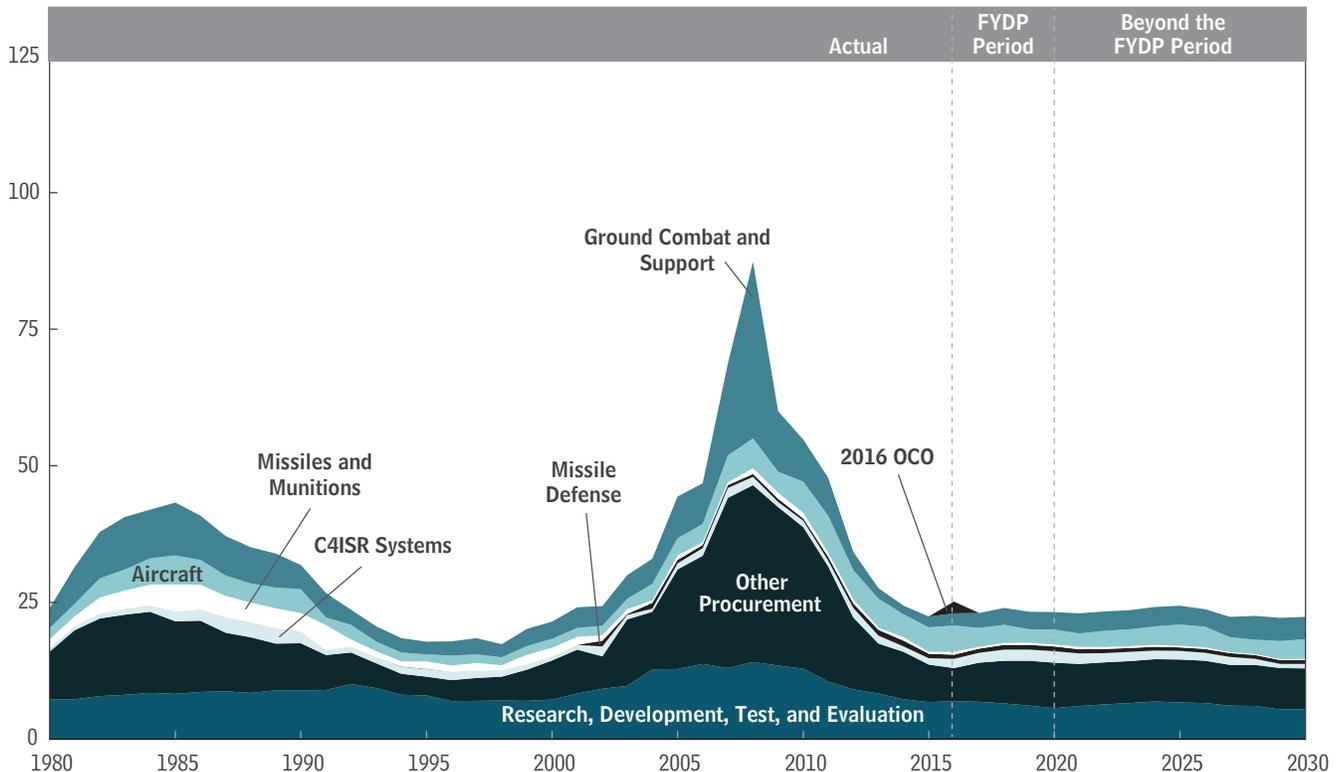
The 2016 budget request contains \$62 billion for acquisition in the base budget for the Department of the Navy and an additional \$455 million for acquisition for overseas contingency operations. Under DoD's plans, acquisition costs for the Navy and the Marine Corps would rise slightly in 2017 but then steadily decrease to \$58 billion by the end of the FYDP period. The \$4 billion difference between 2016 and 2020 reflects a drop of more than \$6 billion, or 35 percent, in RDT&E funding and an increase of \$2 billion in procurement funding. CBO's analysis (which used DoD's estimates as a basis) indicates that the costs to implement the Navy and Marine Corps' acquisition plans would increase substantially in the years immediately after the end of the FYDP, rising to \$67 billion in 2021 (16 percent more than the 2020 amount), remaining at about that level through 2025, and then declining thereafter.

In analyzing future procurement costs for the Navy and the Marine Corps, CBO assessed the services' larger existing programs and potential programs for the next decade and grouped them into four categories: ground combat vehicles (trucks and armored vehicles for the Marine Corps), ships, aircraft, and missiles and munitions (see Figure 3-4). Other systems are included in the category of other procurement. As with the Army, funding for RDT&E is considered separately.

3. Historically, significant funds included in appropriations for the Air Force have been slated for use by other organizations. Those so-called Non-Blue funds have made the Air Force's acquisition costs (and operation and support costs, too) appear somewhat higher than they actually have been. For 2016, about \$24 billion in Non-Blue funds were included in the Administration's request for the Air Force's procurement and RDT&E appropriations. CBO also included the Non-Blue funding in its estimates of Air Force acquisition costs and assumed that amount would remain constant (in real terms) over the entire projection period.

**Figure 3-3.****Costs of the Army's Acquisition Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each category except OCO shows total funding (including that for overseas contingency operations) for 1980 to 2015 and planned base-budget funding from 2016 to 2030.

C4ISR = command, control, communications, computers, intelligence, surveillance, and reconnaissance; FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which the Department of Defense's plans are fully specified; OCO = overseas contingency operations.

The sharp increase would occur in 2021 mostly because of increases in the categories for ship procurement and other procurement. The costs of the programs included in CBO's category for ships would average more than \$23 billion per year in the first five years beyond the FYDP period, about \$4 billion per year more than the average over the five years covered by the FYDP. That increase results largely from the simultaneous procurement of new aircraft carriers and ballistic missile submarines in addition to continued purchases of smaller warships. The sharp increase in other procurement beyond the FYDP period—the average for 2021 to 2030 is 22 percent higher than the average during the five years covered by the FYDP—results from CBO's scaling of procurement levels for smaller systems relative to the portion of acquisition funding devoted to them in the past. Over the

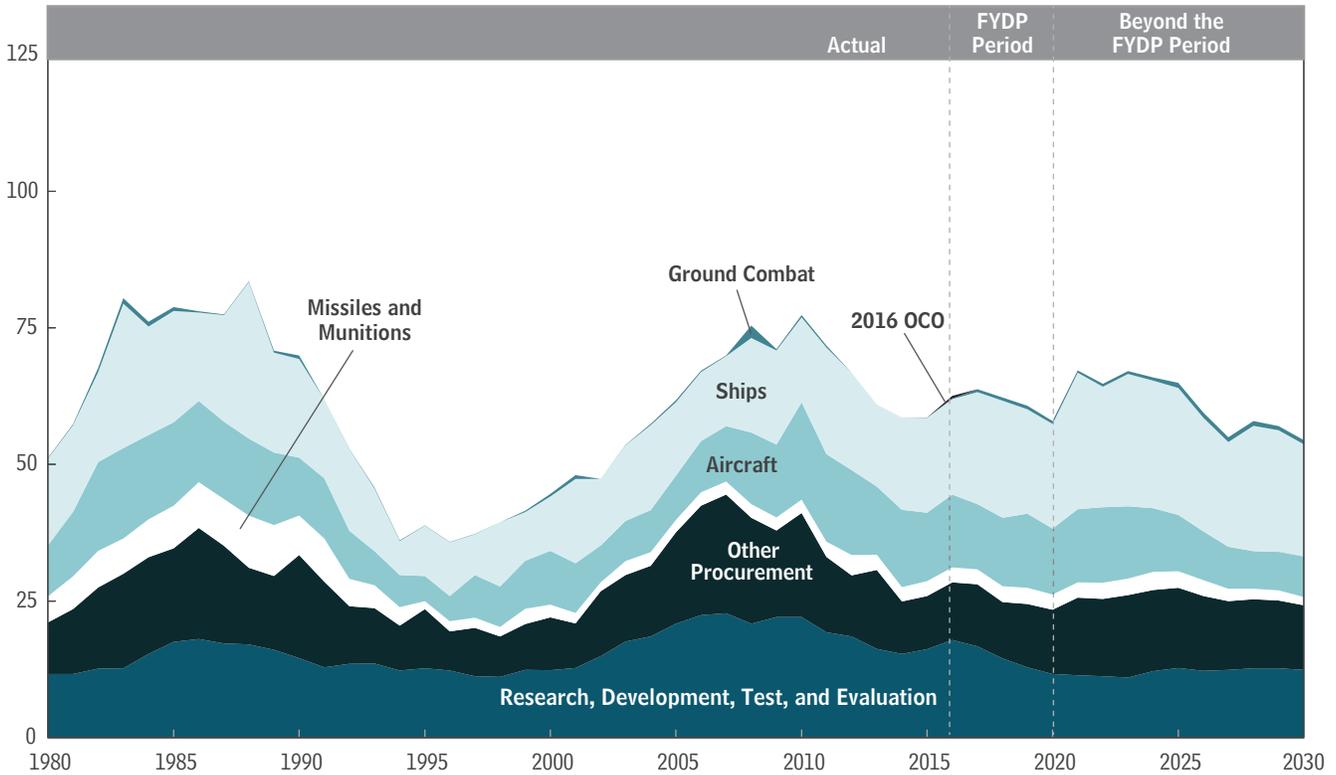
FYDP period, the amount of acquisition funding slated for smaller procurement programs is smaller than the long-term historical relationship between major procurement and other procurement would suggest.

Funding for the other major categories of procurement would be steadier in the years beyond the FYDP period. Similarly, the average annual costs for RDT&E would remain at about the 2020 level through 2030.

Total procurement for ground combat vehicles, aircraft, and missiles would be almost the same in the first five years after the FYDP period as during the FYDP period. Aircraft costs would peak in 2022 and fall thereafter, as procurement of several aircraft (including the KC-130J tanker, the CH-53K heavy-lift helicopter, and the E-2D

**Figure 3-4.**  
**Costs of the Navy’s and Marine Corps’ Acquisition Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each category except OCO shows total funding (including that for overseas contingency operations) for 1980 to 2015 and planned base-budget funding from 2016 to 2030.

FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which the Department of Defense’s plans are fully specified; OCO = overseas contingency operations.

surveillance aircraft) winds down. Procurement of the F-35B and F-35C would continue beyond 2030, and CBO assumed that initial procurement of a new fighter to replace the F/A-18E/F Super Hornet would be under way by 2030.<sup>4</sup>

**The Air Force**

The Administration requested \$68 billion for acquisition in the Air Force’s 2016 base budget and \$4.5 billion in acquisition funding for overseas contingency operations. As with the other services, DoD’s plans for the Air Force

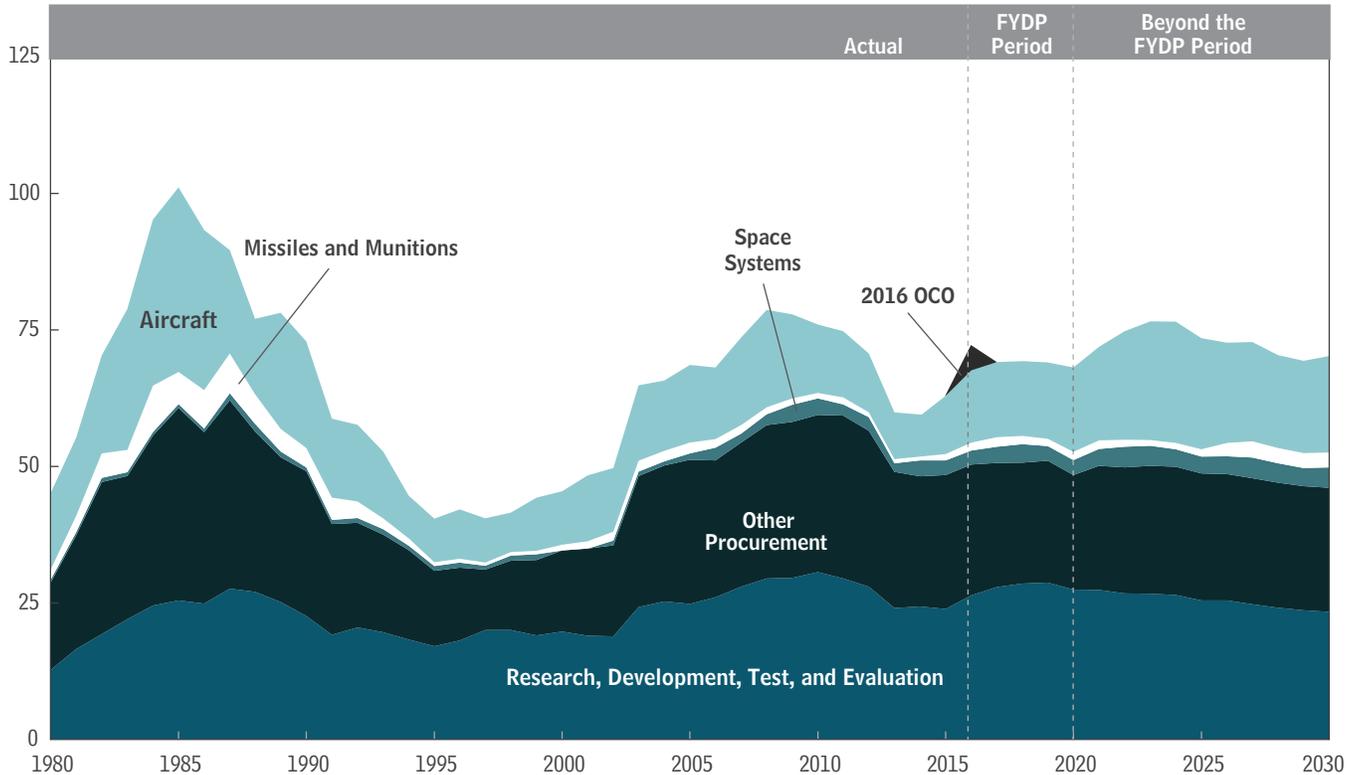
anticipate only minor changes in total annual costs over the FYDP period; according to the FYDP, the Air Force’s acquisition costs would be about \$69 billion for 2017 through 2019 and \$68 billion in 2020. CBO’s analysis indicates that the costs to implement the Air Force’s acquisition plans would increase in the years immediately after the end of the FYDP, jumping to \$72 billion in 2021 (or by 6 percent over the 2020 amount). Costs for the Air Force’s acquisition plans would then increase to \$77 billion in 2023 and 2024 before gradually declining to around \$70 billion toward the end of the projection period.

For its projections of procurement costs for the Air Force, CBO assessed major existing programs and potential programs for the next decade, and grouped them into three categories: aircraft, missiles and munitions, and space systems (see Figure 3-5). Other systems are grouped

4. Instead of developing a new aircraft, the Navy might choose to purchase additional F-35Cs. That course of action would result in lower RDT&E costs than those reflected in CBO’s analysis. Procurement of those additional F-35Cs would probably occur after 2030.

**Figure 3-5.****Costs of the Air Force's Acquisition Plans**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each category except OCO shows total funding (including that for overseas contingency operations) for 1980 to 2015 and planned base-budget funding from 2016 to 2030.

FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which the Department of Defense's plans are fully specified; OCO = overseas contingency operations.

together with other procurement. Funding for research, development, test, and evaluation is also assigned to a separate category.

The increase in acquisition costs in 2021 is mostly attributable to increases in aircraft procurement. The costs of the programs in CBO's aircraft category would average about \$20 billion per year in the first five years beyond the FYDP period, about \$6 billion per year more than the average over the FYDP period. The increase results from nearly doubling the number of F-35 fighters purchased each year (although unit costs are expected to drop with increased production) as well as beginning production of a new long-range bomber, a new high-performance trainer, a replacement for the Joint STARS airborne surveillance aircraft, and a combat search and rescue helicopter.

Procurement for systems in CBO's missiles category would remain steady through 2025 but then nearly double as two missiles intended to carry nuclear warheads—an intercontinental ballistic missile to replace today's Minuteman III and a long-range stand-off missile to replace today's air-launched cruise missile—enter production. Procurement for programs in CBO's space systems category, primarily satellites and the rockets to launch them into orbit, would remain fairly steady over the projection period.

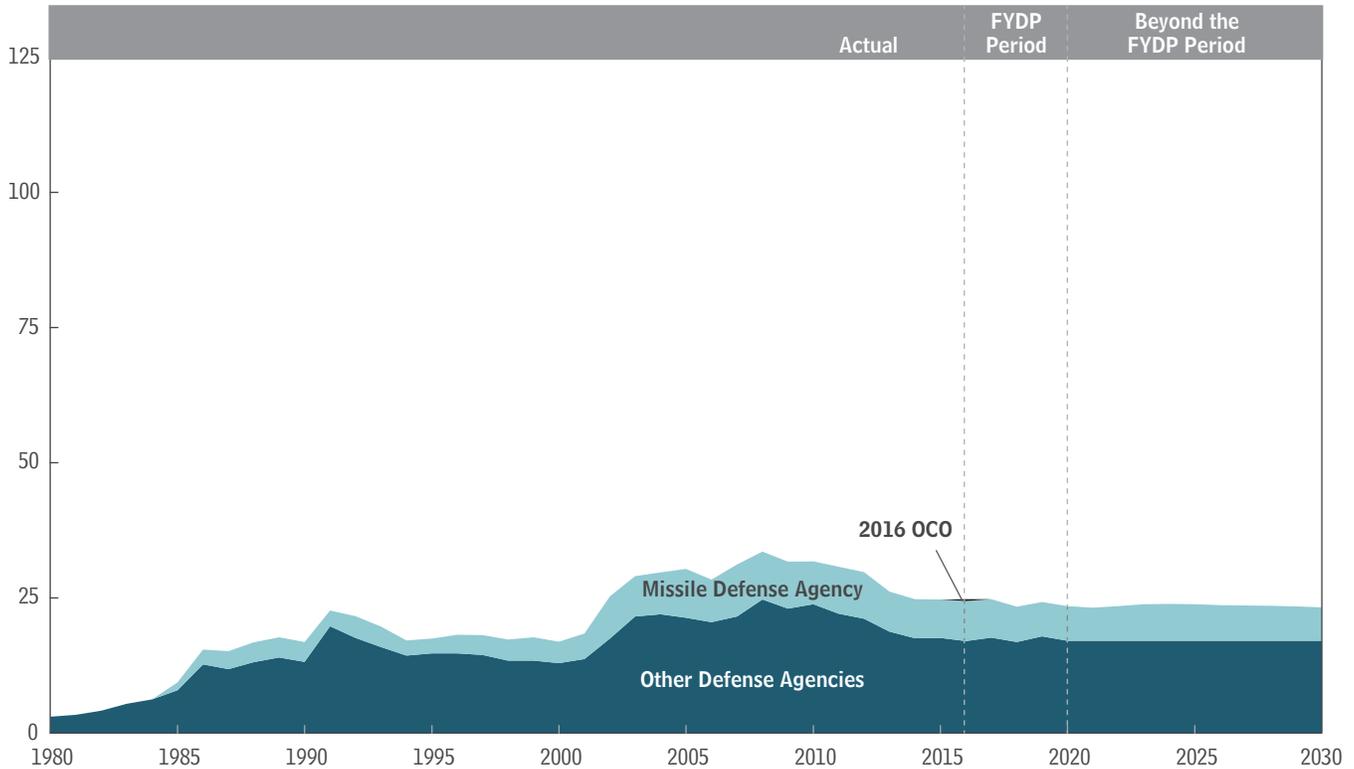
### Other Defense Activities, Including Those of the Missile Defense Agency

In addition to funding for acquisition by the Departments of the Army, Navy, and Air Force, DoD's budget includes funding for acquisition by its other components, including specialized agencies that perform advanced

**Figure 3-6.**

**Costs of DoD’s Acquisition Plans Other Than Those for the Military Services**

Billions of 2016 Dollars



Source: Congressional Budget Office.

Notes: Each category except OCO shows total funding (including that for overseas contingency operations) for 1980 to 2015 and planned base-budget funding from 2016 to 2030.

FYDP = Future Years Defense Program; FYDP period = 2016 through 2020, the period for which the Department of Defense’s plans are fully specified; OCO = overseas contingency operations.

research, develop missile defenses, oversee special operations, and manage financial and information systems. For the 2016 base budget, DoD requested \$24 billion for acquisition related to those activities. According to DoD, acquisition funding for defensewide activities would be about the same over the other four years of the FYDP, and CBO projects little change over the following 10 years.

For its analysis of defensewide acquisition costs beyond the FYDP period, CBO considered two broad categories: costs for the Missile Defense Agency (MDA) and costs for defense organizations other than MDA. CBO assumed costs for the latter category would remain constant (in real terms) through 2030 at about \$17 billion—the costs for 2020 indicated in the FYDP (see Figure 3-6). For MDA, CBO made estimates of future costs on a programmatic basis. The 2016 budget request for MDA was

\$7.5 billion for acquisition (\$6.2 billion for RDT&E and \$1.3 billion for procurement). The funding needed to implement MDA’s current plans would decline to \$6.4 billion at the end of the FYDP period and remain at about that level through 2030.

**Why the Costs of DoD’s Acquisition Plans Are Expected to Increase Sharply in 2021**

The steep increase in acquisition costs just beyond the FYDP period suggests that a classic bow wave is being created by deferring acquisition because of constrained budgets while continuing to plan for substantial acquisition in later years. Bow waves beyond the FYDP period had been a common feature of DoD’s plans for many years, particularly during periods of flat or declining

budgets. For much of the past decade, however, bow waves largely disappeared because budgets grew steadily and DoD expected that steady growth would continue. With the Budget Control Act of 2011 restraining the growth of appropriations, especially in the near term, a substantial bow wave is again apparent.

CBO's analysis (which used DoD's estimates as a basis) of the FYDP and longer-term DoD plans indicates that the total cost of DoD's acquisition plans would jump by 7 percent in the first year beyond the FYDP period, from \$173 billion in 2020 to \$186 billion in 2021. The wave would crest at \$191 billion in 2023. The Navy and the Air Force would account for essentially all of the increase; acquisition costs for the Army and other DoD activities do not show a similar jump.

The steep increase in Navy and Air Force costs primarily results from two factors:

- An increase in procurement funding for major weapon systems, in particular, ships for the Navy and aircraft for the Air Force; and
- An increase in the Navy department's costs for smaller programs that are grouped in CBO's category of other procurement.

The increase in procurement quantities is indicated explicitly by defined purchase schedules in documents such as selected acquisition reports and implicitly in more general policy statements such as the Air Force's plans to field a new bomber and high-performance trainer in the 2020s. In the absence of defined schedules for systems such as those, CBO postulated notional schedules that would be consistent with the services' general plans.

### Major Weapon Systems

Using DoD's estimates as a basis, CBO determined that the Navy would see an increase of \$5.8 billion, or 30 percent, in procurement costs for ships in 2021, and that the Air Force would see an increase of \$1.6 billion, or 10 percent, in the procurement costs for aircraft in the same year.

For the Navy, the increase in projected costs includes a \$6 billion increase for the new ballistic missile submarine and an almost \$2 billion increase for aircraft carriers in 2021. Those amounts would be partially offset by

purchasing one less attack submarine and LX(R) amphibious ship that year than in the preceding and subsequent years.

For the Air Force, the sharp rise in costs would result from increased purchases of C-130 variants (14 aircraft in 2021, up from 4 in 2020), combat search and rescue helicopters (10 aircraft in 2021, up from 8 in 2020), and initial procurement funding for the new bomber, trainer, and a replacement for the Joint STARS airborne surveillance aircraft. Although the quantities of those last three systems would be small, the unit prices of the initial production aircraft are expected to be much higher than average unit prices over the entire production run, as is typical for the initial purchases of most systems.

Avoiding a bow wave in the costs of procuring major systems would probably require deferring one or more of those programs because the annual procurement quantities (or CBO's estimates thereof) in the services' plans for those ships and aircraft are small to begin with. At such low procurement rates, reductions might lead to an unreasonably inefficient operation of production lines and, hence, significant increases in unit costs. Whether such deferral would be possible depends on what service life might remain for the systems being replaced, the costs that might be incurred to extend the service life of existing systems, and the ability of the military to accept a gap in capability if an existing system is retired before its replacement can be fielded.

### Smaller Programs

The other sharp increase in costs from 2020 to 2021 occurs in the Department of the Navy's category of other procurement. During the FYDP years, CBO's category of other procurement represents the difference between a service's plans for total procurement funding and the aggregate procurement funding for the large programs that CBO explicitly tracks. Beyond the FYDP period, the amount of funding CBO estimates for other procurement is based on the historical level of other procurement relative to total acquisition costs. Over the FYDP period, other procurement for the Navy and Marine Corps is somewhat lower than the long-term historical trend estimated by CBO. The increase in 2021 brings other procurement up to a level consistent with that historical trend.

**Table 3-1.****Increase in Acquisition Costs If Cost Growth in Major Programs Follows Historical Patterns**

	Average Annual Increase (Billions of 2016 dollars)		Total Increase (Percent)	
	2016-2020	2021-2030	2016-2020	2021-2030
Army	0.7	3.1	3.0	13.3
Navy and Marine Corps	1.7	4.5	2.8	7.3
Air Force	1.6	4.5	3.6 <sup>a</sup>	9.2 <sup>a</sup>
Other DoD	0.5	1.2	2.3	5.1
Total DoD	4.5	13.3	2.6	7.3

Source: Congressional Budget Office.

Note: DoD = Department of Defense.

a. Calculation of the percentage for the Air Force excludes the so-called Non-Blue portion of Air Force acquisition appropriations. Those funds are passed through to other Department of Defense organizations.

## Why Costs Will Probably Be Higher Than DoD Estimates

To produce long-term projections for acquisition, CBO used DoD's current estimates of development costs, long-range plans for purchase rates and quantities (if available), and current pricing assumptions for the procurement of major weapons (if available). The choice to use DoD's pricing assumptions was intended to reflect DoD's goals and expectations.

In the past, however, DoD has regularly failed to prevent the costs of developing and procuring weapons from rising. Indeed, its plans have incorporated projections of weapons costs that were lower than the costs actually realized. Costs can end up higher than early estimates for a variety of reasons, both external and internal to development programs.

External reasons for cost growth could include:

- Changing economic conditions such as the costs for labor and raw materials,
- Changes in performance requirements, which can result in the need for costly design changes during development, and
- Lower than anticipated annual funding, which can increase total costs by stretching programs out over longer periods and by disrupting established plans and schedules.

Causes of cost growth internal to a program could include:

- Overly optimistic initial cost estimates, and
- Underestimation of the technical challenges of a new system.

With an eye to issues such as those, DoD and the Congress have made some changes to the way that weapon systems are developed and purchased, and further changes are being considered. However, the extent to which they will be successful is not yet clear.

To examine the effect that cost growth in acquisition programs might have on the total costs of DoD's current plans, CBO prepared an alternative estimate incorporating the assumption that DoD's past cost growth would be repeated in the future. CBO applied cost-growth factors based on previous experience to large weapon programs in DoD's plans that have not yet entered production. (For a discussion of CBO's method and the research literature on which it is based, see the appendix).

Replacing current cost estimates for major programs not yet in production with estimates under the historical-cost scenario results in total acquisition costs that are 2.6 percent higher over the FYDP period and 7.3 percent higher for 2021 through 2030 (see Table 3-1). That equates to an additional \$4.5 billion per year, on average, from 2016 through 2020, and an additional \$13 billion per year, on average, from 2021 through 2030. In general, the percentage increases are higher for the 10 years beyond the FYDP period because a larger proportion of costs are for systems that are not in production today and are more likely to experience rising costs.

The increase for the Army is smaller than that for the other military departments in absolute terms because the Army's total acquisition budget is substantially smaller. However, it is larger on a percentage basis (about 13 percent) for the years beyond the FYDP period because development of new Army helicopters and ground combat vehicles has experienced significant cost growth in the past. (Indeed, cost growth in Army systems such as the Crusader artillery system, the Comanche helicopter, the Armed Reconnaissance Helicopter, the Future Combat System of ground vehicles, and the Ground Combat Vehicle contributed to their cancellation before they entered production.) The estimated further growth of 3.6 percent in Air Force acquisition costs during the FYDP period is concentrated in 2019 and 2020, when production is slated to ramp up for several new aircraft, such as the long-range bomber, high-performance trainer, and combat rescue helicopter. Those systems contribute to the relatively high growth projected for the Air Force after 2020.

DoD might offset the effect of cost increases on its yearly budgets by delaying the start of programs, stretching out their schedules, and reducing quantities purchased. In particular, experience indicates that the department often produces smaller quantities than it originally projected, as was the case for the F-22 fighter and the B-2 bomber (the collapse of the Soviet Union also factored into a reassessment of the desired inventory of those aircraft). Similarly, early plans for the F-35 fighter anticipated purchases at a peak rate of 194 aircraft for DoD per year. The current schedule calls for a peak rate of 120 aircraft for DoD per year. Such program changes, however, often result in even higher average unit costs, and overall program costs could end up higher as well. Although the annual costs of current plans could be reduced if quantities were reduced or programs were delayed, such a revised plan would be different from the overall defense plan that CBO is analyzing, and the objectives of that plan would not be met with such revisions.



## Projections of Military Construction and Family Housing Costs

**T**he military construction and family housing budgets that support the infrastructure of military installations together make up a small portion of the Department of Defense's costs. In the 2016 budget, the request for military construction was \$7.0 billion and the request for family housing was \$1.4 billion—only 1.3 percent and 0.3 percent, respectively, of DoD's total base-budget request. The Consolidated Appropriations Act, 2016, provided about the same total funding for infrastructure that was requested by the Administration.

### Military Construction

Appropriations for military construction pay for the planning, design, construction, and major restoration of military facilities. Those appropriations also pay for the base realignment and closure (BRAC) process, including environmental assessments of sites designated for closure and construction projects needed to help consolidate personnel and units.

### Projected Costs

Excluding funding for BRAC, DoD's plans call for \$6.8 billion in funding for military construction in 2016, \$7.0 billion in 2017, and an average of \$5.7 billion in the final three years of the Future Years Defense Program period. Those amounts are higher than the \$5.6 billion the department received for military construction in 2015 but significantly below the \$8.0 billion in funding that DoD received, on average, since 1980, excluding funding for overseas contingency operations and BRAC. Because infrastructure degrades slowly, DoD's plans under the current budget constraints prioritize funding for training and readiness over funding for military construction.<sup>1</sup>

Beyond the FYDP period, the Congressional Budget Office projects that funding for military construction

would revert to the historical average observed between 1980 to 2015, excluding funding provided for BRAC or provided as part of supplemental budgets for overseas contingency operations. CBO projects that the cost of construction will rise at a slightly faster rate than economywide inflation. Adjusting for that difference, CBO estimates that costs for military construction (not including BRAC) would grow from \$8.1 billion in 2021 to \$8.8 billion in 2030.

DoD's plans for military construction include more than \$1.5 billion in total funding from 2018 through 2020 for a future round of BRAC that would commence in 2018. DoD anticipates that it would cost about \$6 billion to implement over six years (with implementation completed around 2023), resulting in savings of about \$2 billion per year thereafter.<sup>2</sup> DoD's budget documents indicate that it would use savings achieved through the elimination of excess infrastructure for higher priorities, such as readiness, which is funded in the operation and maintenance accounts.<sup>3</sup> CBO's projections reflect that policy.

DoD's military construction plans also include expenditures associated with past rounds of BRAC. Between 2016 and 2020, DoD's plans call for spending an average of about \$200 million annually to cover ongoing environmental and caretaking costs for properties that were closed through the BRAC process and have not yet been

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1. Testimony of John Conger, Acting Assistant Secretary of Defense (Energy, Installations and Environment), before the Subcommittee on Military Construction, Veteran Affairs, and Related Agencies of the House Committee on Appropriations (March 3, 2015).
  2. Ibid.
  3. Department of Defense, *Defense-Wide Budget Documentation—FY 2016*, "DoD Base Realignment and Closure," (February 2015), <http://go.usa.gov/cnUgW>.

converted to other uses. After 2021, CBO projects that those costs will remain constant at about \$200 million per year.

### **Why Costs Might Be Higher Than Projected**

DoD's planned funding for military construction between 2016 and 2020 may not be sufficient to prevent the long-term deterioration of its facilities. According to DoD, those levels of funding for facilities will result in significant costs for their repair and replacement in the future.<sup>4</sup> Alternatively, if DoD was to fund military construction at a level equal to the historical average since 1980, it would cost an additional \$9 billion over the FYDP period, or nearly \$2 billion more per year.

In recent years, the Congress has not agreed to DoD's proposal for a future round of BRAC. If that opposition continues, costs would be reduced by \$6 billion between 2018 and 2023. However, DoD's estimated \$2 billion in annual savings resulting from BRAC also would not occur.

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4. Testimony of John Conger, Acting Assistant Secretary of Defense (Energy, Installations and Environment), before the Subcommittee on Military Construction, Veteran Affairs, and Related Agencies of the House Committee on Appropriations (March 3, 2015).

### **Family Housing**

Appropriations for family housing pay for the construction, operation, maintenance, and leasing of military family housing. Those appropriations also support DoD's Homeowners Assistance Fund, which, under certain circumstances, compensates eligible military and civilian personnel who suffer financial loss from the sale of a primary residence.

DoD's plans call for an approximately flat budget for family housing, averaging \$1.5 billion per year (in 2016 dollars) from 2016 to 2020. After 2020, CBO projects that those costs would remain the same. Appropriations for family housing have fallen sharply since 2007 because, under a DoD program to have private companies build housing on bases, the funding for construction costs of most housing units comes primarily from private financing that is not initially recorded in the federal budget. Although the private financing reduces DoD's upfront costs for building and operating family housing, it increases the annual amounts that the department must later pay to military personnel who receive the basic allowance for housing and who rent those housing units. Those larger housing allowances appear in military personnel costs in the operation and support budget.



## Appendix: How CBO Projects Acquisition Cost Growth

**T**he Congressional Budget Office’s alternative estimate for the costs of the Department of Defense’s acquisition plans reflects the agency’s assessment of how the costs of those plans might differ if DoD’s past cost growth is repeated in the future. For the majority of weapon systems, CBO considers the phase of development and applies cost-growth factors derived from research literature to systems in later stages. For some DoD acquisition programs (mostly Navy ships), CBO has, in the course of performing other analyses, already developed specific estimates of the likely cost growth. CBO incorporated those specific estimates into the alternative estimate for the costs of DoD’s acquisition plans.<sup>1</sup>

### DoD’s Phases of Development for Weapon Systems and Associated Cost Growth

DoD has established a system of milestones by which to manage its acquisition programs. Those milestones mark the beginnings of key phases of development:

- Milestone A initiates the technology maturation and risk reduction phase,
- Milestone B initiates the engineering and manufacturing development (EMD) phase, and
- Milestone C initiates the production and deployment phase.<sup>2</sup>

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1. Generally, CBO estimated the cost of new ships on the basis of the relationship between the weight and the actual cost of analogous ships that have already been completed, with adjustments for production efficiencies that occur as more ships of the same type are built simultaneously at a given shipyard and efficiencies that occur as more ships are built over the duration of a production run.

2. Department of Defense, “Operation of the Defense Acquisition System,” DoD Instruction 5000.02 (January 7, 2015), [www.dtic.mil/whs/directives/corres/pdf/500002p.pdf](http://www.dtic.mil/whs/directives/corres/pdf/500002p.pdf) (133 KB).

Significant cost growth tends to begin in the EMD phase, when a system is designed and developed, all technologies and capabilities are fully integrated into a single system, and preparations are made for manufacturing (including developing manufacturing processes, designing for mass production, and managing cost).

Most studies of cost growth begin with the cost estimates contained in the selected acquisition report (SAR) that is released closest to the date of the system’s Milestone B approval and the beginning of the EMD phase; those studies then compare the Milestone B estimates to the actual cost of the programs after they have been completed. When program offices prepare their SARs at the Milestone B juncture, they generally project cost streams for both the research, development, test, and evaluation phase and the procurement phase of the program.

Some acquisition programs also involve small amounts of funding for military construction (for example, to build new aircraft hangars), but most studies of cost growth ignore those types of costs. Also, program offices estimate the costs of operation and support for weapon systems after they enter service, but those costs are often poorly estimated at Milestone B. Indeed, most studies of cost growth do not include those costs. CBO discusses O&S costs in a separate chapter and does not apply the cost growth factors described in this appendix to its projections of O&S costs.

### Research on the Cost Growth of Weapon Systems

RAND has conducted research on the cost growth of weapon systems for several decades, forming a substantial body of literature. The RAND compilations from 2006 provide a good overview of its research to that date as

well as other literature in the field. They summarize many of the key findings from that literature, such as the frequency and timing of cost growth and the average cost growth for different types of weapon systems.<sup>3</sup> Much of the work on cost growth in weapon systems has been based on statistical analyses of SARs to determine the nature, magnitude, timing, and causes of cost growth. Many of those analyses have used the full set of completed SARs since 1969, when the SAR reporting requirement was introduced; others have focused on more recent programs. (Some of the research indicates that cost-growth trends have varied over time.) With the phenomenon of cost growth firmly established and with relatively stable estimates of its magnitude, more recent RAND research has consisted mostly of examining the causes of cost growth for particular acquisition programs.<sup>4</sup>

RAND's work on such cost growth has been complemented by another long line of research by the Institute for Defense Analyses (IDA). That research, as summarized in a study published in 2014, is also based on data from SARs, and it finds cost-growth factors similar to those reported by RAND.<sup>5</sup>

## CBO's Application of Cost Growth Factors

On the basis of the RAND and IDA lines of research, CBO applied separate cost-growth factors for RDT&E costs and procurement costs that are specific to eight types of weapon systems:

3. See Mark V. Arena and others, *Historical Cost Growth of Completed Weapon System Programs* (prepared by the RAND Corporation for the United States Air Force, 2006), [www.rand.org/pubs/technical\\_reports/TR343.html](http://www.rand.org/pubs/technical_reports/TR343.html); and Obaid Younossi and others, *Is Weapon System Cost Growth Increasing? A Quantitative Assessment of Completed and Ongoing Programs* (prepared by the RAND Corporation for the United States Air Force, 2007), [www.rand.org/pubs/monographs/MG588.html](http://www.rand.org/pubs/monographs/MG588.html).
4. See, for example, Irv Blickstein and others, *Methodologies in Analyzing the Root Causes of Nunn-McCurdy Breaches* (RAND Corporation, 2012), [www.rand.org/pubs/technical\\_reports/TR1248.html](http://www.rand.org/pubs/technical_reports/TR1248.html).
5. David L. McNicol and Linda Wu, *Evidence on the Effect of DoD Acquisition Policy and Process on Cost Growth of Major Defense Acquisition Programs* (Institute for Defense Analyses, 2014), [www.acq.osd.mil/parca/docs/ida-p5126.pdf](http://www.acq.osd.mil/parca/docs/ida-p5126.pdf) (PDF; 826MB).

- Battle force ships;
- Command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR);
- C4ISR infrastructure, missile defense, launch vehicles, space systems, and space vehicles;
- Fixed-wing aircraft and unmanned aerial vehicles;
- Rotary-wing aircraft (helicopters);
- Munitions and conventional missiles;
- Strategic missiles; and
- Maneuver (armored vehicles), fire support (artillery), and trucks.

Strictly speaking, the factors used by CBO quantify average historical cost growth relative only to a system's Milestone B cost estimate. CBO's analysis of DoD's acquisition costs, however, spans systems that are in all stages of acquisition, from those already in production (for which uncertainty in costs is typically the smallest) to those that have not yet been formally proposed but that CBO anticipates DoD will pursue by 2030 to replace older systems that are currently in the force (for which there would be no SAR cost estimates).

In applying the historical cost growth factors, CBO considered acquisition programs in three broad categories:

- Systems that have not yet reached Milestone B, for which limited or no cost or schedule information has been defined;
- Systems that have passed Milestone B but for which significant development or cost uncertainty appears to remain; and
- Systems that are in production or are nearing production and appear to have stable costs.

For systems in the first category, CBO prepared notional acquisition schedules and conservative (low) cost estimates using analogous programs from the past as proxies for a DoD cost estimate, and it applied

the factors described above to compute cost growth. For systems in the second category, CBO applied the cost-growth factors to DoD's latest cost estimates for the years remaining in the program. CBO did not add cost growth to systems in the third category.

Regardless of whether or not a particular system has achieved Milestone B, CBO does not apply any cost growth in the budget year (the first year of DoD's Future Years Defense Program). CBO applies 25 percent of the cost-growth factor in the second year of the FYDP,

50 percent in the third year, 75 percent in the fourth year, and the full cost-growth factor starting in the fifth (and final) year of the FYDP. The rationale for those adjustments is that acquisition programs will, with few exceptions, be required to operate within their planned budgets during the budget year, so that any cost growth will be deferred. Also, cost growth for an entire portfolio of acquisition programs will not occur precipitously in a single year, but rather develop more slowly as adverse events (such as testing failures or shortages of materials) accumulate over time.

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## About This Document

This report was prepared at the request of the Chairman and Ranking Member of the Senate Committee on the Budget. In keeping with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

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Director

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