

CBO

The Personnel Requirements and Costs of New Military Space Organizations



MAY 2019

Notes

The years referred to in this report 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 are expressed in 2020 dollars. Costs for years before 2020 have been adjusted for inflation with the gross domestic product price index from the Bureau of Economic Analysis.



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The Personnel Requirements and Costs of New Military Space Organizations

Summary

The U.S. military conducts many operations that involve space. Such operations consist mostly of launching, operating, and maintaining satellites that are used for various purposes, such as communicating, observing the weather, and monitoring other countries' missile launches. The Congressional Budget Office estimates that about 23,000 full-time positions within the Department of Defense (DoD) are dedicated to performing space activities or to supporting those who do—excluding space activities in the intelligence agencies. At the moment, 93 percent of those positions are in the Department of the Air Force.

The Administration has proposed changing that arrangement by creating what it calls a space force—an independent military service within the Department of the Air Force. The Administration has also proposed two more space organizations in its budget proposal for fiscal year 2020: a new combatant command and a new agency that would be responsible for the development and acquisition of space systems. Furthermore, the Administration has proposed creating a civilian Under Secretary for Space who would supervise the space service, report to the Secretary of the Air Force, and perhaps make policy about space.

What Has CBO Analyzed?

In this report, CBO examines five types of space organizations that DoD could create, including the three that the Administration has proposed:

- A new military service within a new military department that would be analogous to the Department of the Army and that would organize, train, and equip space forces;
- A new military service that would exist within the Department of the Air Force, much as the Marine Corps exists within the Department of the Navy, and that would likewise organize, train, and equip space forces;

- A new combatant command that would be structured like the military's Cyber Command and that would employ space capabilities in peacetime and during conflicts;
- A new agency that would be focused on developing and acquiring space systems and that would be analogous to the Missile Defense Agency; and
- A new directorate that would make policy about space and that would be analogous to the office of the Under Secretary of Defense for Intelligence.

CBO estimated the number of new personnel that each of those five organizational options would require for overhead and management, the annual costs that those new personnel would entail, and the onetime startup and transition costs of each option. The estimates in this report are for illustrative policy options; they do not represent cost estimates for any particular piece of legislation.

CBO focused on how much the options would *increase* costs, not how much each option would cost in total. Some current positions in DoD would simply be transferred to a new space organization and thus would not increase DoD's total costs. Also, because it is unclear how much new capability DoD or the Congress might decide to add to a new organization, CBO's analysis does not account for any new capabilities; it includes only the cost of new administrative structures. In addition, the analysis incorporates the assumption that intelligence agencies' space capabilities, which are substantial, would not be transferred to a new space organization. And it incorporates the assumption that positions transferred from existing services to a new organization would not be filled again by the existing services; if they were, costs would increase.

How Much Would New Space Organizations Increase Costs?

Annual costs for new personnel would be much larger for some of the options than for others (see Table 1). For

Table 1.

Additional Overhead and Management Personnel and Costs for New Space Organizations

	New Department	New Service	New Combatant Command	New Development and Acquisition Agency	New Policy Directorate
Number of Additional Personnel (FTEs) ^a	5,400 to 7,800	4,100 to 6,800	400 to 600	1,200 to 2,300	40 to 300
Additional Costs (Millions of 2020 dollars)					
Annual	1,080 to 1,540	820 to 1,340	80 to 120	240 to 460	10 to 60
Onetime ^b	1,400 to 3,240	1,100 to 3,040	520 to 1,060	220 to 560	Less than 10

Source: Congressional Budget Office.

These estimates incorporate the assumption that the new space organizations would not have new capabilities.

FTE = full-time-equivalent position.

a. Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

b. Onetime costs consist of service-to-service transfer bonuses, organizational start-up costs, and new infrastructure costs.

example, CBO estimates that a new military department would require 5,400 to 7,800 new personnel for overhead and management and increase DoD's annual costs by \$1.1 billion to \$1.5 billion. A new service within the Department of the Air Force would be slightly smaller, requiring 4,100 to 6,800 such personnel and increasing annual costs by \$820 million to \$1.3 billion. A new policy directorate, by contrast, would require just 40 to 300 new personnel and increase DoD's annual costs by \$10 million to \$60 million. The options would also incur onetime startup and transition costs, mostly for building new facilities to house the new organizations. CBO estimates that those costs would amount to between \$1 billion and \$3 billion for a new department or service.

How Much Might the Administration's Proposal Increase Costs?

The Administration has provided few details about what the three organizations that it has proposed would look like or how large they would be. For 2020, the initial year of creating those organizations, it has requested \$306 million and 827 positions, and it has also stated that it plans to have the new organizations fully running within five years. If the organizations were the same size as the ones that CBO examines in this report, the Administration's proposal would, when fully implemented, require 5,700 to 9,700 new positions for overhead and management, increase DoD's annual costs by \$1.1 billion to \$1.9 billion, and incur onetime costs of \$1.8 billion to \$4.7 billion, CBO estimates (see the

second, third, and fourth columns of Table 1). Adding any new capabilities would increase those costs.

Types of Military Organizations

DoD might be reorganized in various ways to increase its focus on space; this report considers five. A reorganization might result in a new military department, a new military service, a new combatant command, a new development and acquisition agency, or a new policy directorate. Or it might result in some combination of those structures, as the Administration has proposed.

Military Departments

DoD contains three military departments: the Department of the Army, the Department of the Navy, and the Department of the Air Force. Their role, as established by title 10 of the U.S. Code, is to provide personnel and equipment to commanders during conflicts or peacetime.¹ Each department is led by a civilian secretary, who is responsible for administering, recruiting, training, and preparing forces; formulating policies; conducting research and development programs; and acquiring weapons and other capabilities.

Military Services

There are four military services in DoD: the Army, Navy, Air Force, and Marine Corps. It is therefore difficult to distinguish the role of a service from the role of a department, because three of those four services exist within departments that bear the same names and most of the

1. 10 U.S.C. §§7001–10001 (2018).

same responsibilities. The exception is the Marine Corps, which is part of the Department of the Navy.

Each of the four services is led by a service chief—a four-star general officer who reports to the corresponding department’s secretary. The service chiefs are the Chief of Staff of the Army, the Chief of Staff of the Air Force, the Chief of Naval Operations, and the Commandant of the Marine Corps. Each of the service chiefs also serves as a member of the Joint Chiefs of Staff.

Like a department, a military service has specific responsibilities under title 10 of the U.S. Code to organize, train, equip, prepare, and maintain forces. The service then provides those forces and capabilities to combatant commands. Also like a military department, a military service is responsible for recruiting personnel, formulating policies, conducting research and development, and acquiring weapons and other capabilities.

Combatant Commands

The role of a combatant command, as established under the Goldwater-Nichols Department of Defense Reorganization Act of 1986, is to apply forces to conduct military operations during a conflict or peacetime. Combatant commands are responsible for operations in particular geographic or functional areas. They are supported by the military services and other combatant commands. During the Iraq War, for example, one combatant command, Transportation Command, used airlift aircraft provided by the Air Force to move forces to Iraq to support a second combatant command, Central Command, which is responsible for running military operations in the Middle East.

In general, combatant commanders, who are four-star general officers, are not responsible for organizing, training, or equipping forces; those responsibilities lie with the departments and services. However, Special Operations Command and Cyber Command have taken on some of those roles, blurring the traditional line between combatant commands on the one hand and departments and services on the other.²

Development and Acquisition Agencies

The purpose of development and acquisition agencies is to develop new systems that will be used by the military.

Such agencies exist at various organizational levels. For example, the Missile Defense Agency, which develops missile-defense systems, is not part of any of the three military departments or four services. Rather, it exists within DoD as what is called a defensewide agency, and its commander reports to the Under Secretary of Defense for Research and Engineering. An example more closely related to space is the Space and Missile Systems Center, which is part of the Air Force.

Development and acquisition agencies do not conduct offensive or defensive operations; that is the responsibility of combatant commands. Nor do they organize, train, or equip forces; that is the responsibility of the military departments and services.

Policy Directorates

Policy directorates are agencies that establish policy in certain areas. For example, the Office of the Under Secretary of Defense for Intelligence, or OUSD(I), makes policy related to intelligence and counterintelligence in the military. Another example is the Assistant Secretary of the Air Force for Installations, Environment, and Energy, or SAF/IE, whose office makes policy and provides guidance and oversight on all matters pertaining to Air Force installations.

Policy directorates have several organizational features in common with development and acquisition agencies. For one, they may exist either as an office within the Office of the Secretary of Defense (OSD), as the OUSD(I) does, or within one of the military departments or services, as the SAF/IE does. Also, they do not conduct combat operations or prepare forces.

Establishing New Space Organizations

If the Administration’s proposal to establish a new military service within the Department of the Air Force was adopted, both the Congress and DoD would have to take various steps. There are arguments in favor of the Administration’s proposal and also arguments against it.

Recent History

In 2017, the House Armed Services Committee proposed to establish a new military service within the Department of the Air Force that would be dedicated

2. Those two combatant commands received special authority from 10 U.S.C. §167(e) (2019).

to space operations.³ That proposal was not enacted into law.

In the summer of 2018, the Administration proposed creating a new military department to oversee military operations in space. That fall, the Air Force released an initial proposal for such a department. Under that proposal, the new department would have been an independent entity whose personnel were separated from the Air Force, much as the Air Force itself was separated from the Army after the Second World War.

In March 2019, the Administration advanced a different proposal. In its proposed budget for fiscal year 2020, it called for the creation of three military organizations dedicated to space: an independent service within the Department of the Air Force, including a new Under Secretary for Space; a combatant command; and a development agency. The Administration proposed setting up those organizations over the next five years but did not provide details. It requested, however, that the Congress authorize 827 positions and \$306 million for fiscal year 2020 to begin the process of creating the new organizations.⁴ The Administration also estimated that there would be 15,000 personnel in the new space service, but it provided no further information, such as how many of those positions would be operating forces and how many would support those forces.

Steps in Establishing a New Space Organization

Lawmakers would need to take various actions before any new space organization could be fully established. If the organization was a new department or service, the Congress would need to change laws governing the structure of the military forces, in particular the law that authorizes the current military departments and services.⁵ The Congress would also need to appropriate enough funding to establish a new department or service, confirm high-ranking military officers and civilians to serve in it, and authorize the transfer of forces to it from existing military services.

Implementing a new space combatant command, space development agency, or policy directorate would also require the Congress to act. Though DoD could establish those entities without the enactment of legislation, the Congress would have to confirm high-ranking military officers and civilians, provide funding, and possibly approve other changes.

Once the Congress had taken those steps, a new space organization would take time to establish. At first there would be a transition period so that the military would not lose its ability to carry out space operations. A provisional headquarters would probably be established early in the transition. During the transition, the Air Force would gradually transfer responsibility and personnel to the new organization. And even after the new organization assumed full responsibility, it would continue to evolve, especially if the Congress chose to increase investments and operations in space significantly.

Arguments For and Against Establishing New Space Organizations

A long-standing argument for a separate space organization—and especially for a new service or department—is that the lack of senior advocates for all space operations hinders the development of space-based capabilities and resources.⁶ Like all activities in DoD, operations in space and space systems must compete for resources with other operations and weapon systems. And as the Government Accountability Office has noted, “there is no single individual, office, or entity in place that provides oversight for the overall space program acquisition structure.”⁷ At one point, DoD had designated the Secretary of the Air Force to oversee space programs, but even then, that secretary did not have authority over organizations outside the Air Force that were also involved with space. Supporters argue that creating new space organizations would provide that focus and high-level support.

A related argument is that even within the Air Force, the focus is on air, not space, and that resources for space have suffered as a consequence. Proponents of that

3. National Defense Authorization Act for Fiscal Year 2018, H.R. 2810, 115th Cong. (2017).

4. Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, *Defense Budget Overview* (March 2019), <https://go.usa.gov/xmrGC> (PDF, 4.0 MB).

5. 10 U.S.C. §9011 (2019).

6. See Center for Security Policy, “Space Power: What Is at Stake, What Will It Take” (January 9, 2001), <http://tinyurl.com/ayeg7kn>.

7. Government Accountability Office, *Space Acquisitions: Challenges Facing DOD as It Changes Approaches to Space Acquisitions*, GAO-16-471T (March 2016), www.gao.gov/products/GAO-16-471T.

argument point out that although funding for procurement decreased for both aircraft and space during years of budget declines, such funding grew much more quickly for aircraft than for space during periods of budget increases.⁸ Some advocates also argue that a space force would better prepare the United States to engage in offensive operations in space, which might be necessary in the future.

Also, some advocates of a space service or department note that officers specializing in space have few opportunities, and no dedicated career path, to become generals (or the equivalent).⁹ A separate service or department could provide a more stable and attractive career path for such officers. It might also create more expertise in the community of civilians specializing in space. As a result, members of a space service or department might think in new and better ways about defense problems, focusing on space more than the military currently does.

Critics of a space service or department voice a number of arguments. One is that it might only increase overhead costs and bureaucracy.¹⁰ Another is that creating a constituency for space systems and warfare could lead to the development of weapons and doctrines that are unnecessary and could even endanger the nation.¹¹ Critics also suggest that the United States has not demonstrated the need to conduct offensive operations in space, which undermines the argument for a separate service made by some proponents.¹² Furthermore, critics argue that the benefits of such an organization are unclear and that a comprehensive plan with clear objectives should be provided before the creation of any new space organization.¹³ Critics of a new development and

acquisition agency have similar concerns, arguing that such an agency would duplicate the Air Force's current capabilities.

Estimated Costs of the Policy Options

For this analysis, CBO focused on the *additional* costs of creating and maintaining five different kinds of space organizations. That is, the estimates are not estimates of total spending for those organizations; they are estimates of how much more it would cost to create and maintain such organizations than the federal government currently spends.

CBO also estimated the total number of personnel that each kind of space organization would have. Those estimates cannot be translated into estimates of total costs, because personnel would be only one component of spending for a space organization. Other costs would include acquisition costs, which CBO did not estimate.

CBO's estimates of the additional costs of establishing a space organization focus on overhead and management costs and do not include the cost of adding new capabilities. In that sense, CBO's estimates probably represent the lower end of the range of possible costs. In addition, CBO expects that intelligence agencies' space capabilities, which are substantial, would not be transferred to a new space organization.

The options are generally not mutually exclusive. The government could, for instance, create both a space service and a space combatant command, as the Administration has proposed. The only two options that are mutually exclusive are a new space service in a new military department and a new space service in an existing military department; DoD would presumably not create both organizations.

Finally, the estimates in this report are for illustrative policy options; they do not represent cost estimates for any particular piece of legislation. For more detail about the methods that CBO used to make these estimates, see the appendix.

A New Military Department

CBO estimates that a new military department for DoD's space activities would require 5,400 to 7,800 new overhead and management positions, including a new civilian secretary of the department, a new military service chief, and their support staff (see Table 1 on page 2). Those new positions would increase DoD's

8. See Todd Harrison, "Why We Need a Space Force" (Center for Strategic and International Studies, October 3, 2018), <http://tinyurl.com/yxzvkvxb>.

9. Ibid.

10. See Kaitlyn Johnson, "Why a Space Force Can Wait" (Center for Strategic and International Studies, October 3, 2018), <http://tinyurl.com/y2rpnvne>.

11. See Scott Bixby, "Experts Worry President Trump's 'Space Force' Could Lead to a Space War," *Daily Beast* (July 27, 2018), <http://tinyurl.com/y8rdcvb5>.

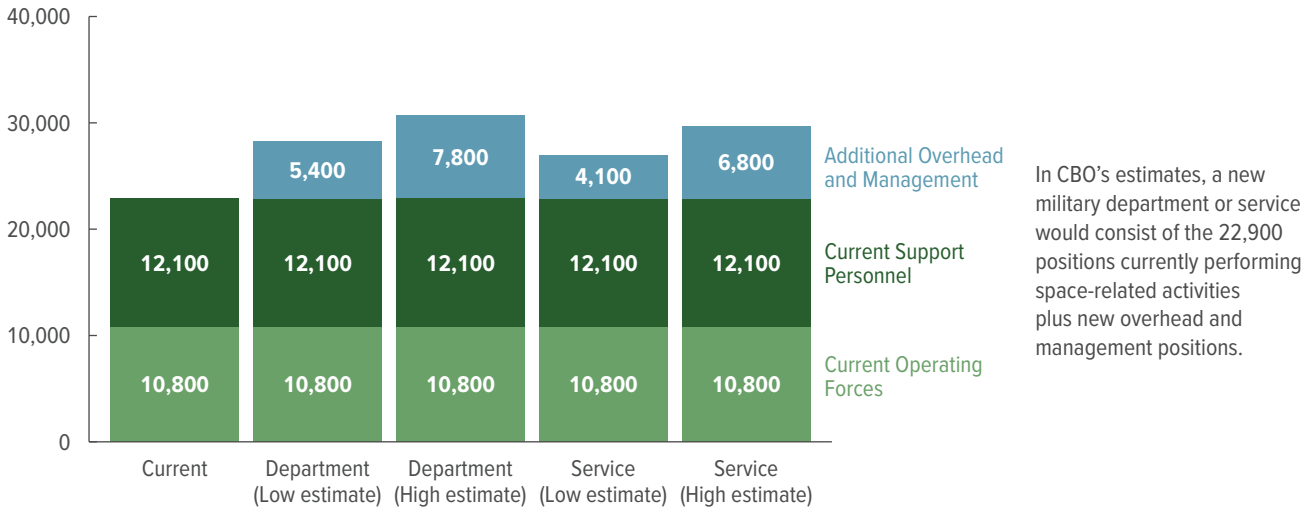
12. See Everett Carl Dolman, "Has the Air Force Been a Good Steward for Space?" *Strategic Studies Quarterly*, vol. 11, no. 2 (Summer 2017), <http://tinyurl.com/y4fupnoo>.

13. See Kaitlyn Johnson, "Why a Space Force Can Wait" (Center for Strategic and International Studies, October 3, 2018), <http://tinyurl.com/y2rpnvne>.

Figure 1.

Number of Personnel in a New Military Department or Service

Full-Time-Equivalent Positions



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

These estimates incorporate the assumption that the new space organizations would not have new capabilities. The estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

costs by \$1.1 billion to \$1.5 billion a year. In addition, CBO estimates, establishing a new military department would incur onetime costs of \$1.4 billion to \$3.2 billion, mostly for new office facilities.

Furthermore, approximately 22,900 positions would need to be transferred from existing military services to the new department (see Figure 1). All told, the new department would therefore have between 28,300 and 30,700 positions.

A New Military Service

If a space organization was instead formed as a new military service within an existing department—presumably the Department of the Air Force—the cost would be slightly smaller. CBO estimates that a new military service would need 4,100 to 6,800 new overhead and management positions, which would increase DoD's costs by \$820 million to \$1.3 billion a year. The onetime costs would be \$1.1 billion to \$3.0 billion, CBO estimates.

As with a new military department, approximately 22,900 positions would be transferred from existing military services. In total, the new service would have 27,000 to 29,700 positions.

For several reasons, a new service would require fewer personnel than a new department would. For one thing, a new service would not need its own secretary or the staff that would support the secretary; instead, the Secretary of the Air Force would oversee it, much as the Secretary of the Navy oversees both the Navy and the Marine Corps. The new military service would have only a new service chief, who would report to the Secretary of the Air Force.

Also, a new service could make use of some of the existing department's support functions. For instance, the new service could rely on the Air Force to provide it with officers, the way most officer candidates for the Marine Corps are brought through the Navy's training programs. The Air Force could also provide medical support, as the Navy does for the Marines. It is also possible that the Air Force could provide base operations and basic training, although the Navy does not provide those two support functions for the Marines.

Whether it was part of a new department or an existing one, the new service would be responsible for developing doctrine to execute missions in space and for conducting operations in space to support combatant commanders. If DoD created a new combatant command, a space service would provide it with forces and capabilities. If

not, the space service would provide support to existing combatant commands.

The Administration included this option in its 2020 budget proposal. The proposal calls for a new military service under the Department of the Air Force with about 15,000 personnel, most of whom would be transferred from elsewhere in DoD. The proposal requests funds only to create an initial headquarters. DoD has indicated that it plans to have the new service fully operational in five years, and it has asked the Congress to give it authority to transfer positions and funding from the existing services during the transition period.

A New Combatant Command

DoD could also create a new combatant command for space operations. CBO estimates that such a command would require 400 to 600 additional personnel and would increase DoD's costs by \$80 million to \$120 million a year. CBO estimates that the onetime start-up and construction costs would be \$500 million to \$1.1 billion.

A new combatant command would be responsible for the command and control of space assets and capabilities to meet national security objectives. Currently, U.S. Strategic Command (STRATCOM) has those responsibilities. Creating a new combatant command would be similar to the Administration's separation of Cyber Command from STRATCOM to make it a separate combatant command in August 2017.

The Administration has already started to create a new space combatant command, but it will need the Congress to authorize and appropriate funding and approve a commander.¹⁴ DoD has not provided any estimates of the size of the command.

A New Development and Acquisition Agency

CBO estimates that a new development and acquisition agency for space would require 1,200 to 2,300 additional personnel and would increase DoD's costs by \$240 million to \$460 million a year. The estimated onetime costs would be \$220 million to \$560 million.

A new development and acquisition agency would develop, test, procure, and field space systems. Because it would have no role in organizing and training forces or using them in operations, it could exist within the Air Force, a new military service, OSD, or the Joint Staff (which is the headquarters staff under the Joint Chiefs of Staff), or it could be a defensewide agency, like the Missile Defense Agency.

DoD has already started to create a defensewide space development agency, but it will need Congressional approval for funding. Presumably the agency would coordinate with the space activities of the Air Force's Space and Missile Center, which currently oversees the Air Force's work on space systems, and with other development agencies.

A New Policy Directorate

CBO estimates that a new policy directorate would require 40 to 300 additional personnel, who would increase DoD's costs by \$10 million to \$60 million a year. The new onetime costs would be less than \$10 million.

A policy directorate would cost less than a development and acquisition agency because it would not have authority over acquisition, testing, or fielding; it would therefore have considerably fewer people. It would be responsible only for establishing policy and providing guidance to secretaries and service chiefs. A new policy directorate could be part of the Air Force, a new military service, OSD, or the Joint Staff.

The Administration has not explicitly proposed a space policy directorate. However, in its budget request for 2020, it has proposed an under secretary within the Department of the Air Force who would be responsible for the overall supervision of space matters. It is unclear how large that under secretary's office would be; it might be the size of the policy directorate that CBO has examined, or it might be smaller.

The Administration's Proposal

The Administration has proposed creating three new space organizations: a military service, a separate combatant command, and a development and acquisition agency within OSD. In its budget request for 2020, the Administration has asked the Congress for the authority that it would need to establish those organizations, as well as funding in 2020 to begin the process

14. See Donald J. Trump, President of the United States, memorandum to James N. Mattis, Secretary of Defense (December 18, 2018), <https://go.usa.gov/xmrGj>.

of creating them. But it has provided few details about what the organizations would look like or how large they would be. For 2020, it has requested \$306 million and 827 positions.

If the organizations, once fully established, were about the same size as the ones that CBO examines in this

report, the Administration's proposal would require 5,700 to 9,700 new positions, increase DoD's annual costs by \$1.1 billion to \$1.9 billion, and incur onetime costs of \$1.8 billion to \$4.7 billion, CBO estimates. Those estimates are the sum of the amounts projected for each of the three new organizations.



Appendix: How CBO Estimated the Personnel Requirements and Costs of the Policy Options

This appendix provides details about how the Congressional Budget Office made the estimates for personnel and costs that it used in this report. CBO made five sets of estimates:

- The number of positions in current operating forces that involve space activities,
- The number of positions that currently provide support to those operating forces,
- The number of additional overhead and management positions that would be needed to support each of the five new space organizations that CBO examined,
- The annual costs of those additional positions for each new organization, and
- The onetime costs of creating each of the organizations.

The first two sets of estimates are for current forces and contribute only indirectly to CBO's estimates of *additional* personnel and costs. CBO has provided them for informational purposes, in part because there is little public information on how many people in the Department of Defense (DoD) are currently involved in space activities.

Positions in Current Operating Forces

To estimate the number of positions that involve space activities in current operating forces, CBO used data from DoD's Future Years Defense Program (FYDP) for fiscal year 2020, searching for all active-duty, National Guard, reserve, and civilian positions identified as performing space operations. Not all of those positions are full time, so CBO converted the numbers into full-time-equivalent positions (FTEs).

CBO found that there were about 10,800 full-time-equivalent personnel identified in the FYDP as

performing space operations. The agency expects that all of those personnel would be transferred into a new space organization if it was organized as a department or as a service—but because those positions already exist, costs would not rise.

Positions That Currently Provide Support

Estimating the number of personnel who currently support space operating forces was less straightforward, because the FYDP does not identify all of those support positions. So CBO used a different approach. First, it identified the number of support personnel in each of eight functions, such as base operations, in the four existing military services (see Table A-1). For example, the number of FTEs in base operations ranges from about 24,200 in the Marine Corps to 42,400 in the Air Force.

CBO calculated the ratios of support personnel in each function to the total number of operating personnel in each military service. CBO then found the minimum, maximum, and average ratio in each function (see Table A-2 on page 11). For example, the ratio of support personnel for base operations to operating forces ranged from a minimum of 8 percent (for the Army) to a maximum of 18 percent (for the Marine Corps). Finally, CBO applied those ratios for each support function to the current number of space operating forces—that is, the 10,800 described above—to estimate how many positions currently support those operating forces (see Table A-3 on page 12). For base operations, CBO multiplied the minimum, average, and maximum ratios by 10,800 to get 863, 1,489, and 1,941 FTEs, respectively.

The resulting estimate of all support personnel ranged from a minimum of about 4,900 to a maximum of about 13,300; the average was about 9,100, which CBO used for its calculations. Of those 9,100 positions, about 6,300 are identified by DoD in the FYDP as supporting space-related activities today (see Table A-4 on page 13). And of those 6,300 positions, about 52 percent

Table A-1.

DoD's Projections of Operating Forces and Support Positions in 2020

Full-Time-Equivalent Positions

	Army	Navy	Marine Corps	Air Force
Operating Forces	483,508	272,091	134,081	268,238
Support Positions				
Base Operations	38,721	36,530	24,161	42,440
Command	7,015	6,975	1,041	8,524
Acquisition	27,523	59,111	2,327	34,527
Logistics	39,588	39,683	3,712	37,531.8
Management	47,285	29,884	8,171	50,076
Medical	15,760	23,034	1	23,840
Personnel	30,624	24,298	12,048	16,592
Training	94,471	55,191	39,283	69,028
Subtotal	300,986	274,706	90,744	282,560
Total	784,494	546,797	224,825	550,798

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

Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

DoD = Department of Defense.

are in acquisition, 34 percent are in management, and 14 percent are in training.

In most categories, DoD identified many fewer support personnel as space-related than the average department-wide ratios would suggest are actually supporting space operating forces. However, in two categories, acquisition and management, DoD identified more space support personnel than those ratios would suggest. So to arrive at its estimate of the total number of positions that are supporting space operating forces today (about 12,100), CBO took the number of positions that DoD identified in those two categories and used the departmentwide ratios to calculate the number of positions in the other six categories (see the right-hand column in Table A-4 on page 13).

If a new military department was formed for space activities, all 12,100 of those support personnel would presumably be transferred to it. But because the positions already exist, costs would not rise.

Similarly, if a new military service was formed, CBO estimated that the same number of support personnel—12,100—would be transferred to it, also without raising costs. That total might overstate the number of positions that would be transferred to the new service if it relied on its parent department to provide some of those support functions. But in either case, DoD's overall costs would not be affected, because those positions would still exist within the parent military department.

For a new combatant command, CBO used a different approach to estimate the number of personnel who currently provide support to operating forces and would be transferred. Because an organization exists today within U.S. Strategic Command (STRATCOM) that provides many of the functions of a new space command but on a smaller scale, CBO assumed that the space support personnel currently assigned to STRATCOM—about 600 positions—would be transferred to the new combatant command and not add to annual costs. (All new positions created for the combatant command would add to annual costs, as this report explains below.)

CBO's estimate for a space development and acquisition agency incorporated the assumption that the space acquisition agencies that exist in each service today would remain in place and that the new agency would be an overarching one that oversaw all of DoD's space acquisitions. (That approach would be similar to the one that DoD used when it created the Missile Defense Agency.) All of the positions in the new agency would therefore be new and would add to annual costs, as this report explains below.

The office of a principal space adviser exists today in the Department of the Air Force. CBO assumes that it would remain in place if a new policy directorate was established under the Secretary of Defense or the Joint Staff. In that case, all the positions in the new policy directorate would be new. If instead the new policy directorate was established within the Department of the Air Force, the positions in the office of the Air Force's space adviser would presumably be transferred to the new directorate, reducing the number of new positions.

Additional Positions for Overhead and Management

CBO estimated the number of additional positions—positions that are not in the military or DoD's civilian

Table A-2.

Ratio of Support Positions, by Function, to All Operating Forces

Percent

	Minimum Among Services	Average Among Services	Maximum Among Services
Base Operations	8.0	13.8	18.0
Command	0.8	2.0	3.2
Acquisition	1.7	10.5	21.7
Logistics	2.8	9.9	14.6
Management	6.1	11.4	18.7
Medical	0	5.2	8.9
Personnel	6.2	7.6	9.0
Training	19.5	23.7	29.3

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

Ratios were calculated with full-time-equivalent positions for active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

workforce today—that the five options would require for overhead and management. Unlike the previous two sets of estimates, the estimates of new positions contribute to CBO’s estimates of the additional costs of a new space organization.

CBO’s estimates incorporate the assumption that a new space organization would continue DoD’s current space activities. Any new capabilities that were added to a new space organization would entail more personnel and costs.

To determine the number of personnel needed for overhead and management functions, CBO reviewed those functions in DoD’s existing departments, services, and other organizations. The functions that CBO identified were the following:

- A secretary (for a military department), a service chief (for a military service), a commander (for a combatant command), a civilian director (for a development and acquisition agency or a policy directorate), and the support staff associated with each of their offices;
- Headquarters staff to support the secretary, chief, commander, or director (for all five options);
- Staff who would be assigned to the Joint Staff to meet the requirements of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (for a department or a service);
- Staff who would be assigned to each of the existing combatant commands, also to comply with the law (for a department or a service);
- Staff to recruit personnel and provide training (for a department or a service); and
- Staff to provide a range of other management and support services, such as financial management and personnel management (for a department or service).

CBO estimated the additional resources needed in each of those different categories for each option; some requirements applied only to certain options (see Table A-5 on page 14).

A New Military Department or Service

Most of the functions for a new department with a new embedded service would be the same as those for a new service within an existing department, although the number of positions assigned to each function might vary. The exception is that only a new department would have a secretariat.

CBO found that although the number of positions assigned to overhead and management functions varies by service, there does not appear to be any correlation between the size of a service and the size of its overhead and management staff for some functions. For example, the size of headquarters staff varies little among the Air Force, Navy, and Marine Corps, even though the Marine Corps is only one-third the size of the other services (see Table A-6 on page 15). Similarly, the law requires services to assign personnel to the Joint Staff and to provide staff to each of the DoD’s combatant commands. So a service that was small, as a space service would probably be, would probably still have a staff for overhead and management that was larger than the size of the service would suggest.

By CBO’s estimates, a new department would be led by a new secretary with a staff of 50 to 65 (see Table A-5 on page 14). That estimate is based on findings by the Government Accountability Office (GAO) about

Table A-3.

Estimated Number of Positions Currently Supporting Space Operating Forces

Full-Time-Equivalent Positions

	Based on the Minimum Ratio Among Services	Based on the Average Ratio Among Services	Based on the Maximum Ratio Among Services
Base Operations	863	1,489	1,941
Command	84	215	342
Acquisition	187	1,132	2,341
Logistics	298	1,065	1,571
Management	657	1,226	2,011
Medical	0	555	958
Personnel	666	820	968
Training	2,105	2,555	3,157
Total	4,860	9,056	13,289

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

Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

the size of secretaries' staffs.¹ GAO found that the size of secretaries' offices in existing departments ranged from 49 positions in the Navy to 65 in the Army.

A new service would also require a new service chief, whether that service was in a new or an existing department. The chief would have a staff of between 100 and 150, CBO estimates. That estimate is also based on GAO's findings about the size of the service chiefs' staffs.

The number of management headquarters staff for a new department would be between 2,200 and 3,400 positions, CBO estimates; for a new service, it would be between 1,000 and 2,600 positions. Those estimates too are based on GAO's analyses, which focused on the Office of the Secretary for each department and the service headquarters staff that supports each service chief. (For example, the Army Staff supports the Chief of Staff of the Army, and the Air Staff supports the Chief of Staff of the Air Force.) The number of management

1. Government Accountability Office, *Defense Headquarters: DOD Needs to Reassess Personnel Requirements for the Office of Secretary of Defense, Joint Staff, and Military Service Secretariats*, GAO-15-10 (January 2015), www.gao.gov/products/GAO-15-10. DoD has undertaken several initiatives since that report was released, but budget documents for 2019 suggest that military departments' headquarters are still about the same size.

headquarters personnel for departments ranges from 2,200 in the Department of the Navy to 3,400 in the Department of the Army, GAO found; for services, it ranges from 1,000 for the Navy to 2,600 for the Marine Corps.

There would be little to no difference between a department and a service in the number of positions assigned to the Joint Staff, the combatant commands, and recruiting and training, in CBO's judgment. CBO estimates that 30 to 40 people from a new department or a new service would be assigned to the Joint Staff. To arrive at that estimate, CBO multiplied its estimate of the number of military personnel in a space department (between 17,400 and 18,900 positions) by the fraction of DoD's active-duty force that the services provide to the Joint Staff (0.2 percent). CBO derived that fraction using the size of the Joint Staff in 2013 (2,570), which was reported by GAO, and the size of DoD's active-duty force in 2013 (1.4 million).

CBO also estimates that a new department or service would have to assign 50 to 100 positions to each of 10 combatant commands in DoD, for a total of 500 to 1,000 positions—an estimate that is based on the average number of positions assigned for the same purpose by existing military services. And CBO estimates that the recruiting and training functions would need 2,000 to 2,200 positions in a department and 1,900 to 2,100 positions in a service. That estimate is based on the average share of active-duty forces that existing services allocate to those activities (about 11 percent), which CBO applied to its estimates of the number of active-duty positions in a new department or a new service.

Other management and support staff would number 550 to 900 positions in a department or a service, CBO estimates. Those estimates are based on the share of staff that the existing departments and services devote to such functions as financial management, personnel management, installation management, and communications, as reported in the services' budget books for 2019 and as indicated by various other data.

Also, if a new service was created within an existing department, it might need fewer overhead and management staff than CBO has estimated if the department's two services shared some functions. Or the opposite could occur. The Marine Corps provides an example of both phenomena: It has just as large a management

Table A-4.

CBO's and DoD's Estimates of the Number of Positions Currently Supporting Space Operating Forces

Full-Time-Equivalent Positions

	Estimate Based on Average Service Ratios	Number Identified by DoD	Number Not Identified by DoD	Estimate of Total Positions
Base Operations	1,489	0	1,489	1,489
Command	215	0	215	215
Acquisition	1,132	3,243	0	3,243
Logistics	1,065	0	1,065	1,065
Management	1,226	2,162	0	2,162
Medical	555	0	555	555
Personnel	820	8	812	820
Training	2,555	872	1,683	2,555
Total	9,056	6,285	5,818	12,103

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

The first column shows the number of positions calculated on the basis of departmentwide average ratios for each category (see Table A-3). The second column shows the number identified by DoD. For most categories, DoD identified fewer personnel than the ratios would suggest, but for two, it identified more. So for those two categories, CBO used DoD's numbers as its final estimates, which are shown in the right-hand column. For the remaining categories, CBO used the calculations that were based on departmentwide average ratios.

Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

DoD = Department of Defense.

headquarters staff as any other service does, perhaps because that staff must perform some of the functions of a secretariat, and yet it has proportionally the smallest recruiting and training staff, because the Navy provides some training for many of its officer candidates and new officers.

Furthermore, if a new service was created within an existing department, there would probably be some growth in the secretariat of the existing department, because it would now oversee and create policy for two military services. (That growth is not included in CBO's estimate.) For example, the Administration's proposal to double the number of Air Force under secretaries by creating a new Under Secretary for Space would require an increase in staff to support that under secretary.

A New Combatant Command

CBO estimates that a new combatant command would need 420 to 640 new positions to staff its commander's office and management headquarters. Those positions would be in addition to the roughly 600 space support personnel who are currently assigned to STRATCOM and would probably be transferred to the new combatant command (but would not add to annual costs). The combatant command would not need any of the other functions that CBO identified.

CBO's estimate is based on the size of U.S. Space Command before it was eliminated in 2002 and its remnants moved to STRATCOM. U.S. Space Command varied in size over the years, ranging from about 1,000 positions to about 1,200. CBO constructed its estimates by subtracting the 600 personnel engaged in space activities in STRATCOM today.

A New Development and Acquisition Agency

CBO estimates that a new development and acquisition agency for space would have a headquarters staff of 1,200 to 2,300 positions. Because the agency would be new, all of those positions would be new and would add to DoD's annual costs. The high end of CBO's estimate is based on the size of the Missile Defense Agency, as reported in DoD's budget justification books for 2019. The low end reflects an agency that is half that size.

A New Policy Directorate

CBO estimates that a new policy directorate would have roughly 40 to 300 positions. All of them would be new because there is no such organization today. CBO's estimates are based on an examination of similar organizations within DoD. The high end of CBO's estimate is similar to the number of positions in the Office of the Under Secretary of Defense for Intelligence. The low end is similar to the number of positions in several smaller policy organizations in DoD.

Annual Costs of the Additional Positions for Overhead and Management

To estimate the cost of the additional positions that would be necessary for each option, CBO multiplied the number of those positions by \$198,600 (see Table A-5). That dollar amount is CBO's estimate of the average cost of adding an FTE in 2020 dollars. The estimate was developed by dividing the Air Force's total operation and support funding, including Defense Health Program costs for military personnel, by the number of FTEs

Table A-5.

CBO's Estimates of Additional Overhead and Management Personnel and Costs for New Space Organizations

	New Department	New Service	New Combatant Command	New Development and Acquisition Agency	New Policy Directorate
Number of Additional Personnel (FTEs) ^a					
Secretary or Director	50 to 65	0	0	5 to 15	3 to 5
Chief or Commander	100 to 150	100 to 150	20 to 40	0	0
Management Headquarters Staff	2,200 to 3,400	1,000 to 2,600	400 to 600	1,200 to 2,300	40 to 300
Joint Staff	30 to 40	30 to 40	0	0	0
Combatant Command Component	500 to 1,000	500 to 1,000	0	0	0
Recruiting and Training	2,000 to 2,200	1,900 to 2,100	0	0	0
Other Management and Support	550 to 900	550 to 900	0	0	0
Total	5,400 to 7,800	4,100 to 6,800	420 to 640	1,205 to 2,315	43 to 305
Additional Costs (Millions of 2020 dollars)					
Annual	1,080 to 1,540	820 to 1,340	80 to 120	240 to 460	10 to 60
Onetime ^b	1,400 to 3,240	1,100 to 3,040	520 to 1,060	220 to 560	1 to 5

Source: Congressional Budget Office.

These estimates incorporate the assumption that the new space organizations would not have new capabilities.

FTE = full-time-equivalent position.

a. Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

b. Onetime costs consist of service-to-service transfer bonuses, organizational start-up costs, and new infrastructure costs.

identified in the FYDP for fiscal year 2020. CBO's estimate reflects the Air Force's full cost per FTE—including all direct costs for pay and benefits, as well as the operation and maintenance funding that supports each FTE.² It is higher than the estimate of \$175,000 made by the Center for Strategic and International Studies, which excludes Defense Health Program costs.³

Although DoD's personnel data (and therefore CBO's estimates of additional positions) do not include contractors, the costs of contractors are incorporated in CBO's estimate because those costs are included in the operation and maintenance funding that CBO used in making its estimate. If the ratio of contractors to FTEs in space activities was greater than the Air Force average, costs could be higher than CBO estimated.

2. CBO used the Air Force's cost per FTE because the great majority of personnel involved in space activities today are Air Force personnel.
3. See Todd Harrison, "How Much Will the Space Force Cost?" (Center for Strategic and International Studies, November 2018), <http://tinyurl.com/y5s3mytp>.

Onetime Costs

Creating new organizations would have some onetime costs. CBO identified three types of onetime costs: start-up costs for such items as signs, uniforms, and stationery; transfer bonuses that a new service may have to pay to encourage current personnel in other services to join; and construction costs for new buildings and facilities. CBO estimates that total onetime costs could range from a few million dollars to \$3.2 billion.

Start-Up Costs

Depending on the size of the organization, start-up costs could range from \$1 million to \$100 million, excluding uniforms, CBO estimated. Those ranges are based on the Air Force's operation and maintenance budget requests to create U.S. Cyber Command, which totaled about \$50 million. Start-up costs would be lower for a smaller organization, such as a policy directorate, and higher for a larger one, such as a service or department.

In addition, CBO estimates that developing and stocking at least two types of uniforms for the military personnel in a new department or service would cost roughly

Table A-6.

Number of Headquarters Personnel Authorized for 2013

	Military	Civilian	Total	Memorandum: Total Size of Service in 2013
Office of the Secretary of Defense	552	2,094	2,646	n.a.
Joint Staff	1,455	1,117	2,572	n.a.
Army	997	2,642	3,639	1,371,268
Navy	1,035	1,341	2,376	591,905
Marines	1,303	1,281	2,584	246,573
Air Force	1,458	1,131	2,589	685,089

Sources: Government Accountability Office; each service's budget materials for fiscal year 2013.

Estimates include active-duty, National Guard, and reserve personnel, as well as government-employed civilians, but not contractor employees.

n.a. = not applicable.

\$200 million. That estimate is based on the recent experiences of the existing services when developing new uniforms.

Transfer Bonuses

DoD would probably pay transfer bonuses if a new space organization was formed as a military department or as a military service. In the other cases, personnel could simply be ordered to move as part of the regular assignment process. DoD has asked the Congress for the authority to order personnel to transfer to a new department or service, but the department is likely to offer bonuses first to encourage people to move voluntarily, much as it does to encourage people to stay in the military (or to encourage them to leave during a drawdown). Involuntary transfers would probably increase the number of people who left when their term was up, which would require the new service to recruit more people and could impair its functioning.

CBO estimates that bonuses would amount to between \$50 million and \$140 million. That estimate is based on two further estimates: that the average bonus would equal \$10,000, which reflects DoD's experience with service-to-service transfer bonuses in 2006; and that 5,300 to 14,100 military personnel would receive those bonuses. The high end of that range reflects a scenario

in which all transferred military personnel get bonuses; the low end reflects a scenario in which only the military personnel that support space operating forces do. Civilians typically do not receive transfer bonuses.

New Buildings and Facilities

To estimate the construction cost of new buildings and facilities to house a space organization, CBO examined recent construction for other defense and government organizations. For a new department, service, or development and acquisition agency, CBO concluded that the costs would come to about \$200,000 per FTE in the new organization. Construction costs would range from \$1.1 billion to \$2.8 billion for a new military department and from \$800 million to \$2.6 billion for a new service, CBO estimates. The low ends of those ranges incorporate the assumption that the new facilities would house all of the new personnel (and use CBO's lower estimate of the number of new positions for a department or a service). The high ends incorporate the assumption that the new facilities would house all of the new personnel (and use CBO's higher estimate of the number of new positions) and half of the 12,100 support personnel that would transfer to the new department or service. For a new development and acquisition agency, CBO estimates that construction costs would range from \$200 million to \$500 million because all of the positions would be new.

CBO's estimate of the cost of facilities for a new combatant command is based on recent construction costs for combatant commands—specifically, about \$500 million for the newly established U.S. Cyber Command and more than \$1 billion for a new headquarters building at U.S. Strategic Command. CBO did not estimate construction costs for a space policy directorate, because it assumed that such a small organization would be housed in existing space.

Other Onetime Costs

Other onetime or start-up costs—such as the cost of developing or buying new information technology systems, management systems, or supply chains—could add to the cost of establishing a space organization. CBO did not account for those costs because they are difficult to anticipate. Instead, the agency's estimates incorporate the assumption that new space organizations would rely on existing systems or on systems that are not more expensive than those funded in typical operation and maintenance budgets.



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About This Document

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

Jason Coleman (a visiting fellow at CBO from the Air Force), Adam Talaber, and F. Matthew Woodward prepared the report with guidance from David Mosher and Edward G. Keating. Sebastien Gay, Ray Hall, Deborah Kilroe, T. J. McGrath (formerly of CBO), David Newman, and Matt Schmit of CBO assisted in the research. The report has substantially benefited from Jason Coleman's detailed knowledge, and because of his association with the Air Force, CBO sought additional internal and external review of the report to ensure its objectivity. Kory Fierstine of CNA, Todd Harrison of the Center for Strategic and International Studies, Margaux Hoar of CNA, Steve Jacques of Velos Consulting, Michael O'Hanlon of the Brookings Institution, and Lara Robillard of CBO provided helpful comments. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.)

Jeffrey Kling and Robert Sunshine reviewed the report, and Benjamin Plotinsky edited it. Robert Rebach prepared it for publication and drew the cover illustration. An electronic version is available on CBO's website (www.cbo.gov/publication/55178).

CBO continually seeks feedback to make its work as useful as possible. Please send any feedback to communications@cbo.gov.

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May 2019