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FY2021 National Defense Authorization Act: Context and Selected Issues for Congress

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SUMMARY

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March 8, 2021

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FY2021 National Defense Authorization Act: Context and Selected Issues for Congress

Public Law (P.L.) 116-283, the FY2021 National Defense Authorization Act (NDAA), enacted by Congress over the veto of President Donald J. Trump, is the 61st consecutive annual NDAA. It mirrors the broad thrusts of the Trump Administration's defense budget request for that fiscal year. The total discretionary budget authority authorized by the bill comes within 1% of the $731.7 billion requested for programs that fall within the scope of the annual NDAA.

Of the funds for which authorization was requested, $662.7 billion – nominally *base budget* funds – would cover the routine, recurring costs to man, train, equip, and operate U.S. forces and to fund other defense-related activities. The request would authorize an additional $69.0 billion designated as funding for Overseas Contingency Operations (OCO) to cover the cost of U.S. military operations arising from the terrorist attacks of September 11, 2001, and certain other activities.

FY2021 National Defense Authorization Act, (P.L. 116-283)

amounts in billions of dollars

	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4909	Enacted P.L. 116-238
DOD Base Budget	636.3	635.5	636.4	635.5
DOD OCO	69.0	69.0	69.0	69.0
DOD Total	**705.3**	**705.5**	**705.4**	**704.5**
Defense-related Nuclear Energy	26.0	26.6	25.9	26.6
Maritime Administration	0.4	0.6	—	0.5
FY2021 NDAA Total	**731.7**	**731.7**	**731.3**	**731.6**

Sources: H.Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S.Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H.Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

The annual NDAA does not provide budget authority for DOD to spend. Rather, it authorizes the appropriation of budget authority, which is accomplished by separate appropriations legislation. The amounts authorized by the NDAA for specific DOD programs and activities are not binding on the appropriations process; however, historically, the NDAA has been a reliable indicator of congressional sentiment on funding for particular items. In addition to authorizing the appropriation of funds amounting to about 97% of the budget request for defense-related discretionary spending, the NDAA contains provisions governing the number of military personnel, rates of their compensation, DOD organization, weapons acquisition policy, and other aspects of U.S. national security policy.

FY2021 NDAA Legislative History (H.R. 6395; S. 4049; P.L. 116-283)

House Report	House Passage	Senate Report	Senate Passage	Conf. Report	Conference Report Approval		President's Veto	House Override	Senate Override
					House	Senate			
H.Rept. 116-442	295-125 7/23/2020	S.Rept. 116-236	86-14 7/23/2020	H.Rept. 116-617	335-78-1 12/8/2020	84-13 12/11/2020	12/23/2020	322-87 12/28/2020	81-13 1/1/2021

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Overview

The National Defense Authorization Act (NDAA) for Fiscal Year 2021 (P.L. 116-283), enacted by Congress over President Trump's veto, mirrors the broad thrusts of the Administration's budget request for that year. The total amount of discretionary budget authority the bill authorizes nearly matches the Administration's $731.6 billion budget request for programs that fall within the scope of the bill. (See **Table 1**.)

Table 1. FY2021 National Defense Authorization Act, (P.L. 116-283)

amounts in billions of dollars

	FY2021 request	House-passed H.R. 6395	Senate-passed S. 4049	Enacted H.R. 6395 P.L. 116-283
Department of Defense (DOD) Base Budget				
Procurement	130.7	132.8	134.0	136.6
Research and Development	106.2	106.5	106.7	104.7
Operation and Maintenance	196.6	193.9	195.6	192.4
Military Personnel	158.9	157.8	156.3	157.6
Other DOD and Defense Health Program	36.1	36.7	36.6	36.1
Military Construction and Family Housing	7.8	7.8	7.8	8.1
DOD Base Budget, subtotal	**636.3**	**635.4**	**636.4**	**635.5**
DOD Overseas Contingency Operations (OCO)	69.0	69.0	69.0	69.0
DOD Total	**705.3**	**704.4**	**705.4**	**704.5**
Defense-related Nuclear Energy (principally Energy Dept.)	26.0	26.7	25.9	26.6
Other Federal Agencies	0.3	0.3	0.0	0.5
NDAA National Defense Total	**731.6**	**731.6**	**731.3**	**731.6**

Sources: H.Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395; S.Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049; and H.Rept. 116-617, Conference Report to Accompany H.R. 6395.

For the most part, the amounts authorized in the NDAA for particular defense-related programs and activities supported the Administration's plans to modernize the U.S. "triad" of strategic nuclear weapons and the full array of conventional forces designed for combat with "near-peer" competitors – namely, China and Russia.

The conference report on the bill (like the versions passed earlier by the House and Senate) also included provisions that contradicted Trump Administration policy on certain contentious issues by, for instance:

- Establishing a process to rename U.S. military bases named for officers who fought for the Confederacy; and
- Encumbering a President's ability to reduce the number of U.S. military personnel deployed in Europe, Africa, and South Korea.

President Donald J. Trump cited these provisions, among others, as reasons for his veto of the bill, which occurred on December 23, 2020. The President also objected that conferees did not include in the bill a revision of Section 230 of the Communications Act of 1934 he had requested.[1]

The House and Senate each voted to override the veto by margins larger than the two-thirds majority required by the Constitution. The House acted on December 28, 2020, and the Senate on January 1, 2021. (See **Table 2**.)

Table 2. FY2021 NDAA Legislative History (H.R. 6395; S. 4049; P.L. 116-283)

House Report	House Passage	Senate Report	Senate Passage	Conf. Report	Conference Report Approval		President's Veto	House Override	Senate Override
					House	Senate			
H.Rept. 116-442	295-125 7/23/2020	S.Rept. 116-236	86-14 7/23/2020	H.Rept. 116-617	335-78-1 12/8/2020	84-13 12/11/2020	12/23/2020	322-87 12/28/2020	81-13 1/1/2021

Scope of the NDAA

Enacted annually since 1961, the NDAA does not provide budget authority for the government to spend. Rather, it authorizes the provision of such budget authority through the enactment of separate appropriations bills. According to the Government Accountability Office (GAO), the amounts authorized for particular DOD programs and activities are not binding on the appropriations process.[2] Historically, however, the NDAA has been a reliable indicator of congressional sentiment on funding levels for most of the hundreds of projects and activities identified in the budget request. The NDAA also includes hundreds of provisions of law that regulate various aspects of DOD operations.

The House and Senate Armed Services Committees' reports to accompany their respective versions of an annual NDAA typically contain directive language on a variety of subjects. This directive language is not legally binding, and is generally regarded as a mandate for a particular defense agency or official to take a particular action.

The NDAA currently authorizes discretionary funding for nearly all Department of Defense (DOD) activities and for certain other defense-related programs. Prior to 1959, the only statutory requirement for annual authorization of funding for DOD programs applied to military construction projects. The military construction authorization bill for FY1960 (enacted in 1959) included a provision – generally known as the Russell Amendment – requiring annual authorization of any funds appropriated for aircraft, missiles, or ships beginning in FY1962.

Congress expanded the scope of this requirement for annual authorization (now codified at 10 U.S.C. 138) over the following three decades, eventually encompassing practically the entire discretionary budget for DOD and for the defense-related nuclear energy programs now under Department of Energy (DOE) purview.[3]

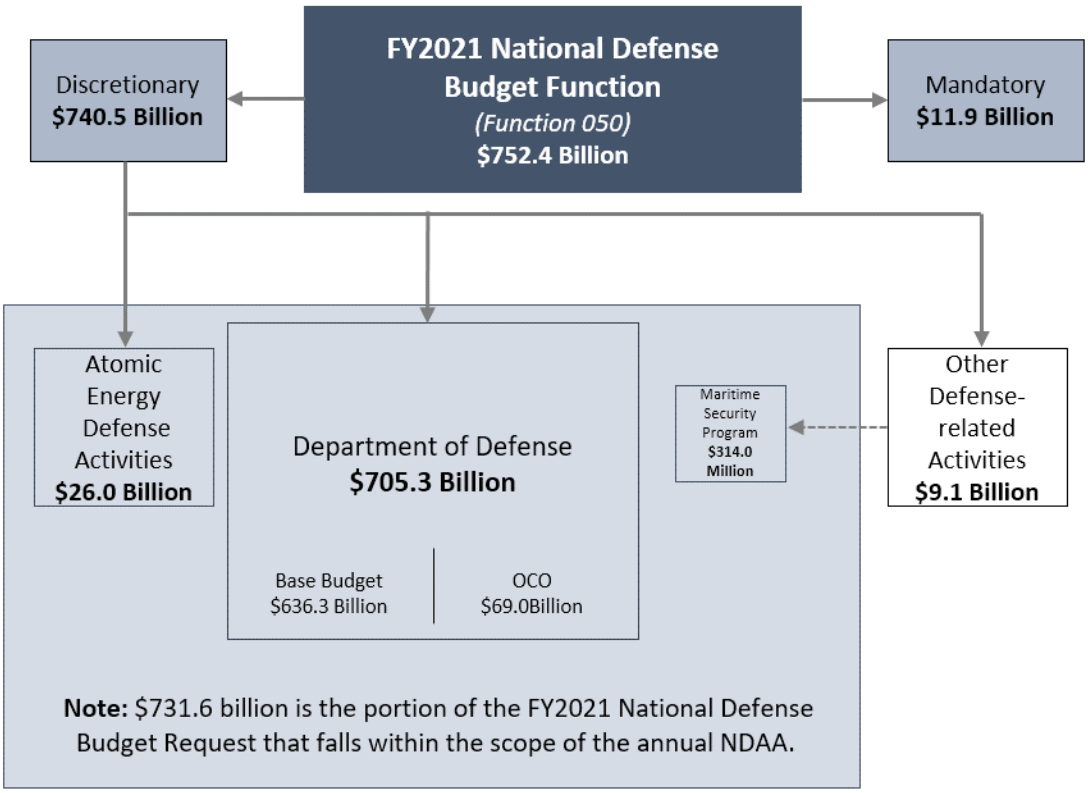
[1] The statutory provision in question, 47 U.S.C. 230, allows Internet service providers to block content they deem "obscene,... harassing, or otherwise objectionable." For background and analysis, see CRS Legal Sidebar LSB10484, *UPDATE: Section 230 and the Executive Order on Preventing Online Censorship*, by Valerie C. Brannon et al.

[2] GAO, *Principles of Appropriations Law* ["The Red Book"], 4th ed., 2016 Rev., Ch. 2, pp. 2-56 through 2-56, GAO-16-464SP (Washington, D.C., March 2016).

[3] See Williams, Cecil W., "Annual Authorization of Appropriations: The Historical Development of 10 U.S.C. 138," *The Air Force Law Review*, Volume 21 (1979), Issue 4, pp. 481-551.

The FY2021 NDAA authorizes funding for about 97% of the total national defense-related budget proposed by the Trump Administration, more than 95% of which is allocated to the Department of Defense (DOD). (See **Figure 1**.)

Figure 1. FY2021 National Defense Budget Request Within Scope of the NDAA



Source: H.Rept. 116-617, Conference Report to Accompany H.R. 6395.

Increases and Offsets

While the amount authorized in the NDAA is close to the amount requested, the bill incorporates hundreds of changes that would authorize more or less than requested for particular projects and activities. Most of these changes involve relatively small amounts (considering the size of the defense budget) and were explained by the conferees in funding tables by brief references to (a) some practical change in circumstances affecting a particular item, (b) some change desired by the conferees, or (c) the conferees' judgment that the request for certain funds has not been adequately justified by DOD's budget justification material.

However, the bill also would make certain changes to authorize more than requested, in some cases by hundreds of millions of dollars or more.

Among these larger increases are:

- $3.51 billion (nearly 20%) in Navy shipbuilding funds, of which $2.29 billion would fund a second attack submarine (in addition to the one submarine requested); and
- $1.17 billion for 14 more F-35 fighters, in addition to the 79 requested.

In the funding tables of the conference report, conferees indicated that some of the larger reductions in the bill reflected changed circumstances. For instance, $1.71 billion is cut from the authorization request for operation and maintenance (O&M) funding to reflect lower-than-budgeted fuel costs.[4] Similarly, the conference report reduced the authorization for O&M budget lines by $970.2 million on grounds that restrictions associated with the COVID-19 pandemic would slow the pace of operations and training activities.[5]

Relation to Budget Caps

The total authorized by the NDAA–like the Administration's authorization request–is consistent with a binding cap on discretionary spending for national defense in FY2021. The annual caps on discretionary defense spending through FY2021, initially established by the Budget Control Act of 2011 (P.L. 112-25), have been amended several times, most recently by the Bipartisan Budget Act of 2019 (P.L. 116-37).

The cap applies to discretionary budget authority for activities comprising the National Defense Budget Function (Function 050), except for funding designated by Congress and the President as being for emergencies or for Overseas Contingency Operations (OCO).[6] Originally the Obama Administration used the OCO designation to label funds associated with U.S. military operations in and around Iraq and Afghanistan. After enactment of the BCA, the designation took on additional significance as a way to effectively bypass the defense spending cap.

The Obama and Trump Administrations, and Congress, have assigned the OCO designation to certain funds intended to cover routine, so-called *base budget* purposes. The $69 billion designated as OCO funding in the Trump Administration's FY2021 budget request included $16.0 billion for base budget purposes including ground force and naval operations and overhauls of equipment.[7]

The conference report designated as OCO an additional $1.65 billion that had been requested in the base budget. This was offset by a $1.50 billion cut to the requested OCO authorization which conferees identified as a result of reductions in the number of U.S. personnel deployed in Afghanistan.

Budget Control Act and DOD

For additional information on the Budget Control Act of 2011 and its impact on the defense budget, see CRS Report R44039, *The Defense Budget and the Budget Control Act: Frequently Asked Questions*, by Brendan W. McGarry, and CRS Report R42972, *Sequestration as a Budget Enforcement Process: Frequently Asked Questions*, by Megan S. Lynch

Strategic Context

The President's FY2021 budget request for national defense reflected a renewed emphasis on strategic competition with great powers – specifically with Russia and China – called for by the

[4] Section 4301 of H.Rept. 116-617, p. 2079.

[5] Section 4301 of H.Rept. 116-617, pp. 2055, 2057-58, 2062, 2064-66, 2069-72, and 2077.

[6] For additional background, see CRS Report R44039, *The Defense Budget and the Budget Control Act: Frequently Asked Questions*, by Brendan W. McGarry. The Administration of President George W. Bush had designated these funds as for the Global War on Terrorism (GWOT).

[7] Office of the Undersecretary of Defense (Comptroller), *Defense Budget Overview* [FY2021], p. 6-3, Table 6-3.

2018 National Defense Strategy (NDS). During the Cold War, U.S. national security policy and the design of the U.S. military establishment were focused on strategic competition with the Union of Soviet Socialist Republics and on containing the spread of communism globally. In the years following the collapse of the Soviet Union, U.S. policies were designed – and U.S. forces were trained and equipped – largely with an eye on dealing with potential regional aggressors such as Iraq, Iran, and North Korea and recalibrating relations with China and Russia.

After the terrorist attacks of 9/11, U.S. national security policy and DOD planning focused largely on countering terrorism and insurgencies in the Middle East while containing, if not reversing, North Korean and Iranian nuclear weapons programs. However, as a legacy of the Cold War, U.S. and allied military forces had overwhelming military superiority over these adversaries and, accordingly, operations were conducted in relatively permissive environments.

The 2014 Russian invasion of the Crimean peninsula and subsequent proxy war in eastern Ukraine fostered a renewed concern in the United States and in Europe about an aggressive and revanchist regime in Moscow. Meanwhile, China began building and militarizing islands in the South China Sea in order to lay claim to key shipping lanes. Together, these events highlighted anew the salience in the U.S. national security agenda of dealing with other *great powers*, that is, states with armed forces that are competitive with U.S. forces. At the same time, the security challenges that had come to the fore in the wake of the Cold War —fragile states, genocide, terrorism, and nuclear proliferation, to name a few—remained serious threats to U.S. interests.

Moreover, in some case, adversaries appear to be collaborating to achieve shared or compatible objectives and to take advantage of social and economic tools to advance their agendas. Some states are also collaborating with non-state proxies (including, but not limited to, militias, criminal networks, corporations, and hackers), blurring the lines between conventional and irregular conflict and between civilian and military activities. In this complex security environment, conceptualizing, prioritizing, and managing these myriad problems, arguably, is more difficult than it was in eras past.

The Trump Administration's December 2017 National Security Strategy (NSS)[8] and the 11-page unclassified summary of the January 2018 NDS[9] explicitly reorient U.S. national security strategy (including defense strategy) toward a primary focus on great power competition with China and Russia and on countering their military capabilities. In addition to explicitly making great power competition the primary U.S. national security concern, the NDS also argues for a focus on bolstering the competitive advantage of U.S. forces, which, the document contends, has eroded in recent decades in relation to the Chinese and Russian threats. The NDS also maintains that, contrary to what was the case for most of the years since the end of the Cold War, U.S. forces now must assume that their ability to approach military objectives will be vigorously contested.

The Trump Administration’s strategic orientation, as laid out in the NSS and NDS, is consistent with the strategy outlined in comparable documents issued by prior Administrations in identifying five significant external threats to U.S. interests: China, Russia, North Korea, Iran, and terrorist groups with global reach. In a break from previous Administrations, however, the NDS views retaining a U.S. strategic competitive edge over China and Russia as a higher priority than countering violent extremist organizations.

[8] Office of the President, *National Security Strategy of the United States*, December 2017, https://trumpwhitehouse.archives.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf 0905-2.pdf.

[9] Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*, January 2018, https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf.

China-focused Initiatives

In the months preceding release of the Administration's FY2021 defense budget request, senior military officers launched two initiatives that highlighted China as the more salient of the United States' two great power rivals.

In August of 2019, General David H. Berger, newly appointed Commandant of the Marine Corps, published a statement of his priorities for the Marine Corps. These priorities included changes in organization and equipment intended to enhance the Corps' ability to pursue the priorities set by the NDS.[10] Berger's Force Design plan, issued in March 2020, proposed to train and equip relatively small, easily deployable Marine Corps units armed with anti-ship cruise missiles and other weaponry. These units could move from island to island in the western Pacific to contest Chinese control of the South China Sea and East China Sea. To fund the new force structure, Berger proposed to eliminate Marine Corps tank units and scale back other units intended for armored combat.[11]

Also in March 2020, Admiral Philip S. Davidson, commander of U.S. forces in the Indo-Pacific region, provided Congress with a report containing proposed procurements and other activities that the report asserted would allow those forces to better meet the requirements of the new National Defense Strategy. This report, which was required by Section 1253 of the FY2020 NDAA (P.L. 116-92), proposed strengthened air and missile defenses in Guam and other western Pacific sites and investment in long-range, conventionally armed, precision-strike weapons. The report estimated the proposal's cost to be an additional $18.5 billion above currently projected DOD budgets for FY2022-2026.[12]

2018 National Defense Strategy: Focus on Great Power Competition

For additional background and analysis on the National Defense Strategy and the heightened focus on the Indo-Pacific region, see: CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke; CRS Report R44891, *U.S. Role in the World: Background and Issues for Congress*, by Ronald O'Rourke and Michael Moodie; CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*, by Ronald O'Rourke; CRS In Focus IF11127, *Strategic Competition and Foreign Policy: What is "Political Warfare"?*, by Kathleen J. McInnis and Martin A. Weiss; CRS In Focus IF11139, *Evaluating DOD Strategy: Key Findings of the National Defense Strategy Commission*, by Kathleen J. McInnis; CRS In Focus IF11525, *COVID-19: National Security and Defense Strategy*, by Kathleen J. McInnis; and CRS Insight IN10855, *The 2018 National Defense Strategy*, by Kathleen J. McInnis.

Budgetary Context

The DOD budget generally has trended upward since the Korean War with spikes of growth associated with the war in Vietnam, the final decade of the Cold War, and the wars in Afghanistan and Iraq. (See **Figure 2**.)

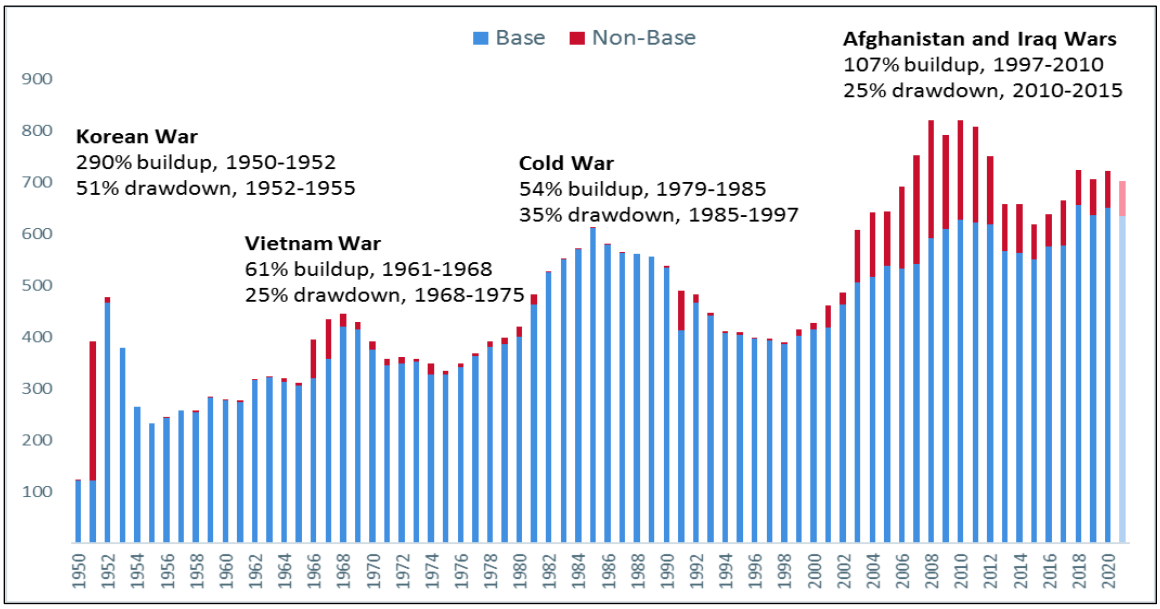
[10] *Commandant's Planning Guidance*, 38th Commandant of the Marine Corps, https://www.hqmc.marines.mil/Portals/142/Docs/%2038th%20Commandant%27s%20Planning%20Guidance_2019.pdf?ver=2019-07-16-200152-700.

[11] *Force Design 2030*, March 2020, https://www.hqmc.marines.mil/Portals/142/Docs/CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460. See CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiatives*, by Andrew Feickert.

[12] *Regain the Advantage*, USINDOPACOM's Investment Plan for Implementing the National Defense Strategy, [executive summary], https://int.nyt.com/data/documenthelper/6864-national-defense-strategy-summ/8851517f5e10106bc3b1/optimized/full.pdf.

Figure 2. DOD Budget Authority, FY1950-FY2021 (projected)

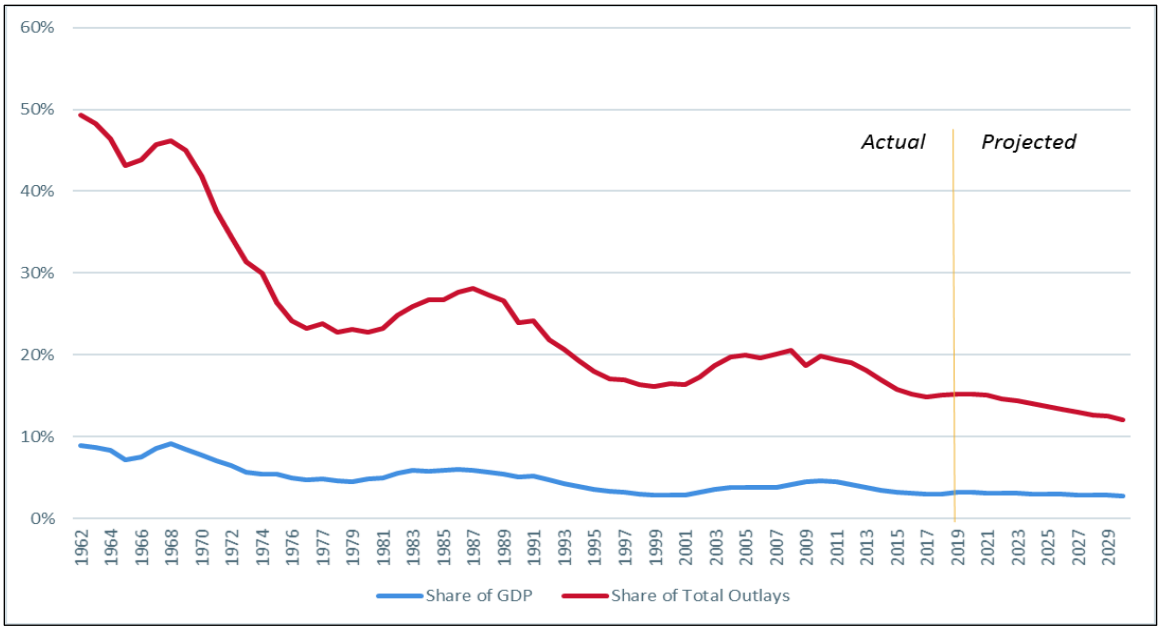
amounts in billions of constant FY2020 dollars



Source: CRS analysis of Office of Management and Budget, Tables 24-1, S-7, and 10.1, accompanying the FY2021 President's budget request; Department of Defense, Office of the Under Secretary of Defense (Comptroller), National Defense Budget Estimates for FY2020, Tables 6-8 and 2-1; FAD-809 table, January 1978; Congressional Budget Office, Supplemental appropriations reports from the 1970s-2000s. See also CRS Report R44519, *Overseas Contingency Operations Funding: Background and Status*, by Brendan W. McGarry and Emily M. Morgenstern.

Over the same period, the DOD budget shrank both as a percentage of federal outlays and as a percentage of the country's Gross Domestic Product (GDP). (See **Figure 3**.)

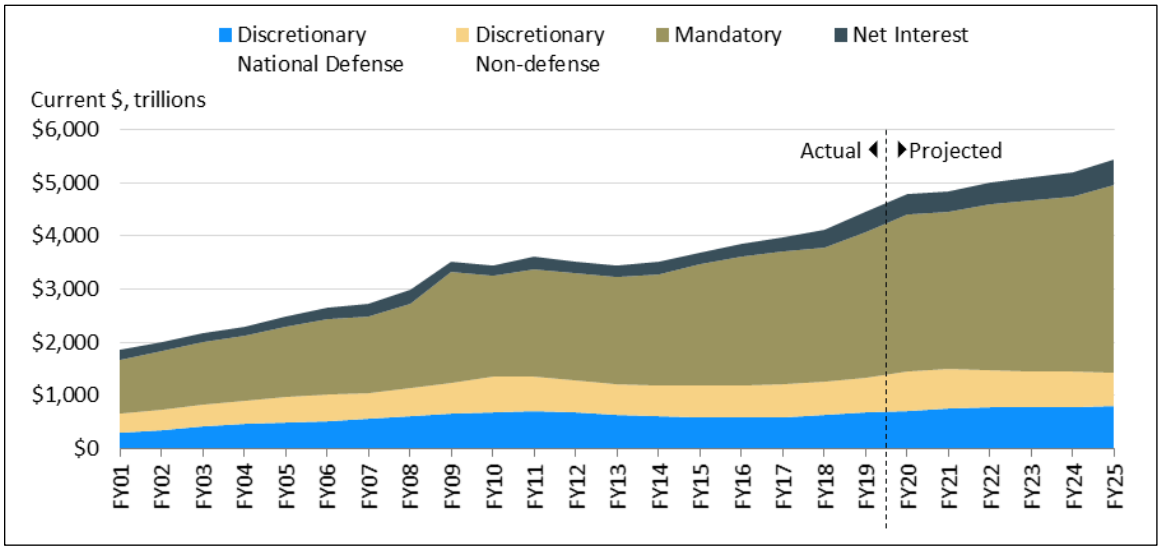
Figure 3. DOD Outlays as a Share of Federal Outlays and of Gross Domestic Product (GDP), FY1962-FY2019 and (projected) FY2020-FY2030



Source: Data for FY1962-FY2019 from Office of Management and Budget, Historical Tables 8.1 and 10.1, accompanying the FY2021 President's budget request; Projected data for FY2020-FY2030 from Congressional Budget Office, 10-Year Budget Projections, Tables 1-1 and 1-4, (January 2020).

As the DOD share of federal outlays declined, the offsetting growth has occurred chiefly in mandatory spending, mostly for entitlement programs including Social Security, Medicare, and Medicaid. In 1962, when discretionary defense spending accounted for nearly half of federal outlays (49.2%), and discretionary non-defense accounted for 18.3%, the share allocated to mandatory programs was 26.1%. By 1996, mandatory spending had risen to account for half of all federal outlays (50.4%) while discretionary spending accounted for slightly more than one-third, almost equally divided between defense and non-defense programs. In 2021, mandatory programs are projected to account for 61.4% of federal outlays. Discretionary programs are projected to account for 30.8% of federal outlays, almost equally divided between defense and non-defense programs. (See **Figure 4**.)

Figure 4. Outlays by Budget Enforcement Act Category, FY2001-FY2019 and (projected) FY2020-FY2030



Source: Data for FY1962-FY2019 from Office of Management and Budget, Historical Tables 8., accompanying the FY2021 President's budget request; Projected data for FY2020-FY2030 from Congressional Budget Office, 10-Year Budget Projections, Tables 1-1 and 1-4, (January 2020).

Notes: The four categories of federal spending are defined by the Budget Control Act of 2011 (P.L. 112-25). The outlay spike in 2020 reflects COVID-19-related spending.

Impact of COVID-19 on the FY2021 NDAA

Congressional action on the FY2021 defense budget occurred in the context of the Coronavirus Disease 2019 (COVID-19) pandemic. This context might impact DOD directly, by reducing the amount of funds available for traditional defense programs, and indirectly, by altering the global security arena in which DOD aims to protect U.S. interests.

The FY2021 NDAA incorporated actions intended to deal with two more immediate consequences of the pandemic.

Reduced Tempo of Operations

As previously noted, the bill provided $970.2 million less than the amounts requested for operations and maintenance accounts on grounds that, because of COVID-19-related restrictions, training and other operations would move at a slower pace than the budget request assumed.

Potential Cost Hikes and Delays

COVID-19-related limits on work schedules delayed production and delivery of major weapons and consumables at defense contractors' facilities and in the transportation links and logistical hubs that comprise DOD's logistics enterprise.[13] During a Pentagon press conference on April 20, 2020, then-Undersecretary of Defense for Acquisition and Sustainment Ellen M. Lord, projected

[13] For additional information on DOD's Logistics Enterprise see CRS Video WVB00325, *Defense Logistics 101*, by Tyler F. Hacker.

a three-month delay in the delivery of many major programs, with aviation and shipyards among the categories most affected.[14]

Because DOD pays many contractors incrementally, as products or services are delivered, a slowdown in delivery results in a slowdown of payments. DOD had accelerated the pace of these so-called *progress payments* on certain types of contracts. Section 891 of the enacted bill authorizes accelerated payments to additional types of contracts subject to certain conditions. Among the conditions is a requirement that the contractor pass along the accelerated payments to subcontractors and suppliers.

COVID-19 Implications for DOD

For background and additional analysis, see CRS Report R46336, *COVID-19: Potential Implications for International Security Environment—Overview of Issues and Further Reading for Congress*, by Ronald O'Rourke, Kathleen J. McInnis, and Michael Moodie; CRS In Focus IF11480, *Overview: The Department of Defense and COVID-19*, coordinated by Kathleen J. McInnis; CRS Insight IN11273, *COVID-19: The Basics of Domestic Defense Response*, coordinated by Michael J. Vassalotti; and CRS In Focus IF11525, *COVID-19: National Security and Defense Strategy*, by Kathleen J. McInnis.

Selected Authorization Issues

Removing Confederate Names from DOD Bases

Section 370 requires the Secretary of Defense to establish a commission to produce, within three years, a plan to remove from all DOD assets all names, symbols, monuments, and paraphernalia that honor or commemorate the Confederacy, except for Confederate grave markers. Section 370 is identical with Section 377 of the Senate-passed S. 4049. Ten Army bases currently are so named and the Navy cruiser U.S.S. Chancellorsville is named for a Confederate victory.[15]

Confederate Names on DOD Assets

For additional background and analysis of this issue, see CRS Insight IN10756, *Confederate Names and Military Installations*, by Barbara Salazar Torreon; and CRS Report R44959, *Confederate Symbols: Relation to Federal Lands and Programs*, coordinated by Laura B. Comay.

Regional Deployments

The bill supports the broad thrust of Trump Administration efforts to bolster U.S. military power in the Western Pacific. However, it also includes provisions that would restrict a president's ability to reduce the number of U.S. military personnel deployed abroad.

[14] Department of Defense, "Press Conference by Ellen M. Lord, Undersecretary of Defense for Acquisition and Sustainment," April 20, 2020, https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/2157331/undersecretary-of-defense-as-provides-update-on-dod-covid-19-response-efforts/.

[15] The FY2020 NDAA (P.L. 116-92) included a provision (Section 1749) prohibiting the Secretary of Defense from giving any new or existing military base or other DOD asset a name referring to the Confederacy, including the name of any person who served the Confederacy or the name of a Confederate battlefield victory. However, the provision stated that DOD is not required (by terms of this provision) to review any base or asset already bearing such a name.

Indo-Pacific Region

Section 1251 directs DOD to create a program, to be known as the Pacific Deterrence Initiative (PDI), intended to coordinate various activities intended to increase the combat power of U.S. and allied military forces in the Western Pacific. The stated aim of the program is to more effectively deter military moves by China and to reassure U.S. allies in the region. In their explanatory statement, conferees identify as elements of the newly created initiative 60 projects for which the bill authorizes a total of $2.23 billion. Of the 60 projects, 49 had been included in the Trump Administration's budget request for a total of $2.08 billion.

Troops in South Korea

Trump Administration officials had said, in July 2020, consideration was being given to weighing the withdrawal from South Korea of an unspecified number of the 28,500 U.S. troops stationed in that country.[16] Section 1258 prohibits any such reduction until 180 days after the Secretary of Defense certifies to the defense committees that:

- The proposed reduction is in the national security interest of the United States;
- It will not "significantly undermine the security of U.S. allies in the region; and
- That the Secretary has "appropriately consulted" with allies, including Japan and South Korea, concerning the reduction.

U.S. Forces in Europe[17]

Section 1245 prohibits any reduction of U.S. troops in Germany (below the 34,500 personnel currently stationed there) until 120 days after the Secretary of Defense presents to the House and Senate Armed Services Committees, Senate Foreign Relations Committee, and House Foreign Affairs Committee a detailed written assessment of the consequences of the proposed move. Among the topics to be addressed in the assessment are the cost of any proposed re-stationing of U.S. forces and its likely impact on the security of the United States and its NATO allies.

The section also expressed the sense of Congress that the presence of U.S. forces in Germany serves as both a strong deterrent to Russian military aggression in Europe and an essential support for U.S. operations in the Middle East, Africa, and Afghanistan.

Section 2828 prohibits DOD from closing or turning over to the host nation government any installation in Europe currently under DOD control, unless the Secretary of Defense certifies that there is no longer a foreseeable need for its use by additional U.S. forces deployed to Europe.

DOD and Domestic Law Enforcement

Section 1064 requires that military personnel civilian federal law enforcement officers who are providing support to federal agencies dealing with civil disturbance display a name tag that

[16] See, for example, Michael R. Gordon and Gordon Lubold, "Trump Administration Weighs Troop Cut in South Korea," Wall Street Journal, July 17, 2020, https://www.wsj.com/articles/trump-administration-weighs-troop-cut-in-south-korea-11595005050.

[17] See CRS In Focus IF11130, *United States European Command: Overview and Key Issues*, by Kathleen J. McInnis and Brendan W. McGarry, CRS In Focus IF11280, *U.S. Military Presence in Poland*, by Andrew Feickert, Kathleen J. McInnis, and Derek E. Mix; and CRS In Focus IF10946, *The European Deterrence Initiative: A Budgetary Overview*, by Paul Belkin and Hibbah Kaileh.

identifies the individual and the military service (or federal agency) to which he or she belongs. The provision exempts personnel who do not wear a uniform or are engaged in undercover activities in regular performance of their duties.

Military Equipment for Law Enforcement Agencies

Section 1053 places restrictions on the so-called 1033 Program under which the Defense Logistics Agency makes surplus military equipment available to state and local law enforcement agencies.[18] The provision bars the transfer to law enforcement agencies of bayonets, lethal grenades, weaponized tracked combat vehicles, and aerial drones equipped with weapons. The provision also requires that personnel in law enforcement agencies that receive DOD equipment under the program undergo training in respect for citizens' constitutional rights and in conflict de-escalation.

DOD Management Issues

Section 901 eliminates the position of Chief Management Officer (CMO) of DOD, a position created by the FY2017 NDAA (P.L. 114-328, Section 133b(c)). This position was the third-ranking official in the department, charged with oversight of DOD's business operations. The section requires the Secretary of Defense to reallocate to some other DOD office (within one year of enactment) every resource and responsibility currently attached to the CMO.

Information for Congress

Section 908 would require DOD to assess commercially available analytical tools and services that could systematize DOD's management and delivery of reports to Congress mandated by the annual NDAA.

Budget "Pass-Throughs"

In the reports to accompany their respective versions of the NDAA, the House and Senate Armed Services Committees each directed DOD to present its annual budget request in a way that would identify funds that are requested for the appropriation accounts of the Army, Navy, or Air Force but which are passed on to other agencies.[19] These non-statutory directions continue to stand since they were not contradicted by the explanatory statement of the NDAA conference report.

The procedural change thus directed would address the contention of some that, in comparing the armed forces' shares of the DOD budget, the Air Force budget is overstated, as its budget includes procurement and research and development (R&D) funding for U.S. intelligence agencies. The total amount of this intelligence-related funding in the Air Force budget is classified.[20]

In the Air Force's FY2021 budget request, $21.1 billion (44.8%) of all procurement funding is in a single budget line labelled "Classified Programs". Similarly, $15.8 billion (42.2%) of all R&D funding is in a single budget line also labelled "Classified Programs."

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[18] For background and additional information, see CRS Legal Sidebar LSB10486, *Congress and Police Reform: Current Law and Recent Proposals*, by Joanna R. Lampe.

[19] See H.Rept. 116-442, p. 190, and S.Rept. 116-236, p. 281.

[20] For more on intelligence budgeting see and CRS Report R44381, *Intelligence Community Spending: Trends and Issues*, by Michael E. DeVine, and CRS In Focus IF10524, *Defense Primer: Budgeting for National and Defense Intelligence*, by Michael E. DeVine.

Military Personnel Issues

The NDAA authorizes an end-strength for the active components of 1,348,375 personnel, which is 3,125 personnel below the Trump Administration's request. The ceiling represents an increase of 8,875 personnel above the end-strength authorized for FY2020, with the largest increase slated for the Navy. (See **Table 3**.)

Table 3. FY2021 Military End-strength

number of personnel authorized

	FY2020 Authorized	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conf. Rept. H.R. 6395 P.L. 116-283	Conf. Rept. Change from Request
Army	480,000	485,900	485,900	485,000	485,900	0
Navy	340,500	347,800	347,800	346,730	347,800	0
Marine Corps	186,200	184,100	184,100	180,000	181,200	-2,900
Air Force	332,800	327,266	327,266	333,475	333,475	+6,209
Space Force	n/a	6,434	6,434	0	0	-6,434
Total, Active Component	**1,339,500**	**1,351,500**	**1,351,500**	**1,345,205**	**1,348,375**	**-3,125**
Selected Reserve	800,800	802,000	802,000	802,000	802,000	0
Coast Guard Reserve	7,000	7,000	7,000	7,000	7,000	0

Sources: H. Rept. 116-442 House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

The bill authorizes the Trump Administration's proposed end-strengths for the Selected Reserve, defined by DOD as those reserve units and individuals designated as "so essential to initial wartime missions that they have priority over all other Reserves."[21] Members of the Selected Reserve are generally required to perform one weekend of training each month and two weeks of training each year, although some may train more than this.

Military Personnel Costs

The bill authorizes $149.19 billion for the pay and benefits of military personnel, a reduction of $1.34 billion from the amount requested. Of the total reduction, funding tables in the conference report justify $169.8 million on grounds that the growing strength of the dollar against certain foreign currencies will reduce the dollar cost of goods and services purchased on the local economy to support U.S. forces stationed abroad.

As requested, the NDAA authorizes $8.37 billion for accrual payments to the Medicare Eligible Retiree Health Care Fund. This program – commonly referred to as "TRICARE for Life" – funds health care expenses for Medicare-eligible military retirees and their families.

[21] DOD Instruction 1215.06, (March 14, 1997).

Basic Pay Increase

Section 601 directs the 3% increase in military basic pay (effective January 1, 2021) requested by the Trump Administration, which is equal to the annual increase in the Labor Department's Employment Cost Index (ECI).[22]

Basic Pay Raise and Military Compensation

For additional background and analysis see CRS In Focus IF10260, *Defense Primer: Military Pay Raise*, by Lawrence Kapp, and CRS In Focus IF10532, *Defense Primer: Regular Military Compensation*, by Lawrence Kapp.

Racial and Gender Diversity

Section 551 requires DOD to develop metrics and benchmarks by which to measure the progress toward the goals of increasing the diversity and inclusiveness of the armed forces in terms of gender, race, and ethnicity. The provision also requires the Secretary of Defense to accompany the National Defense Strategy – produced every four years – with a detailed report on the diversity of the armed forces in terms of total membership, enlistments, promotions, and graduations from the national service academies.

Other provisions of the bill relevant to issues of diversity and racial equality include:

- Section 553, which requires the addition of questions about racism, anti-semitism, and supremacism to certain DOD workplace surveys.
- Section 557, which requires DOD to commission an independent review of barriers to minority participation in certain types of military units and job specialties that the bill identifies.
- Section 558, which requires a GAO analysis of trends in equality of opportunity at the military service academies.
- Section 547, which requires a GAO report on implementation by DOD of (1) the recommendations of a 2019 GAO report on racial and gender disparities in the military justice system[23] and (2) the certain requirements mandated by Section 540I(b) of the FY2020 NDAA (P.L. 116-92),

Supremacist, Extremist, and Criminal Gang Activities

Section 554 directs the Secretary of Defense to appoint an additional Deputy Inspector General of DOD with responsibility for investigating (1) the effect of military personnel policies and practices on diversity and inclusion in DOD, and (2) the effectiveness of DOD's efforts to combat supremacist, extremist, and criminal gang activities by military personnel.

The original House-passed version of H.R. 6395 included a provision (Section 531) that would have amended the Uniform Code of Military Justice (UCMJ) to define certain types of activity as "violent extremism" punishable by court-martial. The prohibited activities would have included any act or threat of violence intended to intimidate or coerce any class of people or to influence or

[22] By law (10 U.S.C 1009), military personnel receive an annual increase in basic pay that is indexed to the annual increase in the ECI unless either (1) Congress passes a law to provide otherwise or (2) the President specifies an alternative pay adjustment.

[23] U.S. Government Accountability Office, *DOD and the Coast Guard Need to Improve their Capabilities to Assess Racial and Gender Disparities*, GAO-19-344, 2019, https://www.gao.gov/products/GAO-19-344.

retaliate against the policy or conduct of the U.S. government to achieve political, ideological, religious, social, or economic goals; or in the case of an act against a person or class of people, for reasons relating to the race, religion, color, ethnicity, sex, age, disability status, national origin, sexual orientation, or gender identity of the person or class of people concerned.

This House-passed provision was not included in the enacted version of the bill. However, in the Joint Explanatory Statement, conferees said that, "a punitive article under the [UCMJ] to prohibit violent extremist criminal acts may be appropriate to deter and prosecute this behavior within the Armed Services."[24]

Diversity in the Armed Forces

For background and additional analysis see CRS Report R44321, *Diversity, Inclusion, and Equal Opportunity in the Armed Services: Background and Issues for Congress*, by Kristy N. Kamarck.

Sexual Assault Prevention and Prosecution

The bill includes several provisions supporting Congress' long-running effort to address sexual assault in the armed forces. Among these are:

- Section 539A, which requires DOD to implement so-called "safe-to-report" policies under which an alleged sexual assault victim could report the assault without fear of being subject to punitive actions for minor misconduct uncovered in the course of the sexual assault investigation.
- Section 538, which mandates that if a cadet or midshipman student at one of the national service academies is the alleged victim of sexual assault by a fellow cadet or midshipman, both persons shall, "to the extent practicable, each be given the opportunity to complete their course of study at the academy without (1) taking classes together; or (2) otherwise being in close proximity to each other during mandatory activities."

Schools for Military Dependents

Section 589B of the bill blocks a Trump Administration plan to increase the size of classes for kindergarten and grades 1 through 3 in the network of elementary schools run by DOD for service members' dependents. The provision freezes the ratio of students to teachers in those grades at 18:1, the current level, through the end of the 2023-2024 school year.

Section 589A of the bill authorizes funds (not requested by the Trump Administration) for assistance to local school systems near DOD installations that enroll significant numbers of military dependents. The bill authorizes $50 million for this so-called *impact aid* and an additional $10 million to be paid to school districts enrolling higher concentrations of military dependents with severe disabilities.[25]

[24] H.Rept. 116-617, p. 1629.

[25] Since 1950, the federal government has provided "impact assistance" to local educational agencies to compensate for the loss of tax revenue as a result of activities of the federal government. For example, local governments cannot collect property taxes or other taxes from a military base nor from military personnel living on the base. In addition to that program, currently managed by the Department of Education, Congress has authorized and appropriated DOD-funded aid to local educational agencies since the early 1990s. Since 2002, Congress also has provided an additional category of DOD-funded impact aid for school districts with large numbers of military dependents with special needs. Typically, Congress authorizes and funds these DOD impact programs although they are not included in the annual

Cancer and Military Aviation

Section 750 requires DOD to commission a study by the National Institutes of Health and the National Cancer Institute to determine whether military pilots and aviation support personnel experience higher rates of cancer diagnosis and death than their peers in the armed forces who are not associated with aviation operations. If aviation personnel show a higher incidence of cancer, the study is to, among other actions, try to identify toxic materials or specific types of work environments that might account for that pattern. The results are to be reported to the Armed Services and Veterans Affairs Committees of the House and Senate.

Suicide Prevention

The bill includes several provisions intended to combat suicide among military personnel, among which:

- Section 514 eliminates the sunset date of a suicide prevention program for the reserve components that had been slated to lapse at the end of FY2025;
- Section 549A requires that each suicide attempt be reviewed by a multidisciplinary board including military unit leaders, medical and mental health professionals, and military criminal investigation specialists;
- Section 742 expands the scope of a currently required annual DOD report to include the number of deaths by suicide that have occurred within one year of a service member having returned from a deployment; and
- Section 752 requires a review by the GAO of DOD efforts to prevent suicide among service members assigned to remote duty stations outside the contiguous 48 states.

DOD Suicide Prevention Efforts

For additional information and analysis, see CRS In Focus IF10876, *Military Suicide Prevention and Response*, by Kristy N. Kamarck; and CRS Insight IN11164, *Suicide Rates and Risk Factors for the National Guard*, by Kristy N. Kamarck, Bryce H. P. Mendez, and Xavier L. Arriaga.

Energy and Environment Issues

The bill authorizes a total of $7.35 billion for environmental remediation at defense-related facilities, including the following:

- $1.07 billion, as requested, for DOD's Environmental Restoration accounts that fund the remediation of environmental contamination and unexploded ordnance (UXO) at active and former U.S. military installations;
- $300.4 million, as requested, for the Defense Base Closure account that includes funds for remediation and other environmental compliance activities at defense installations closed as a result of a Base Realignment and Closure (BRAC) process;
- $5.82 billion, $832.2 million more than was requested, for the Energy Department's Defense Environmental Cleanup account that funds the cleanup of former U.S. nuclear weapons production sites; and

DOD budget request. For additional information, see CRS Report R45400, *Impact Aid, Title VII of the Elementary and Secondary Education Act: A Primer*, by Rebecca R. Skinner.

- $163.3 million for the DOE Office of Legacy Management charged with long-term stewardship of nuclear sites after cleanup is complete.

The bill includes several provisions intended to reduce DOD's dependence on energy sources that could be interrupted by enemy action or natural disaster. It also includes provisions intended to address environmental concerns related to natural disasters and the impact of climate change.

Energy Resilience

Section 316 aims to promote the energy resilience of DOD installations; that is, their ability to continue essential operations if access to external sources of energy is lost. The section directs the Secretary of Defense to ensure that, by 2030, all of the energy needed to sustain the critical operations of each base will be available at least 99.9% of the time.[26] The provision stipulates that plans intended to meet that requirement be based on the use of "multiple and diverse sources of energy, with an emphasis favoring energy resources originating on the installation." The provision requires that installations' compliance with this requirement be verified by so-called "black start exercises" in which, after power supplied from sources outside the base is cut off, critical operations on the base proceed without interruption for a test period that would last no longer than five days.

Fossil Fuel Reduction

The bill also include provisions intended to reduce the dependence of U.S. forces on conventional, petroleum-based fuels.

Section 321 establishes a pilot program under which, for at least two large bases,[27] DOD must purchase non-combat vehicles powered by "alternative fuels" (such as natural gas, propane, electricity, or hydrogen) provided the cost of those vehicles does not exceed by more than 10% the cost of conventionally fueled vehicles.

Section 323 requires DOD to contract with a federally funded research and development center (FFRDC)[28] to analyze the extent to which DOD has developed an integrated operational energy strategy as well as the feasibility of implementing so-called "net zero" goals for military installations. GAO defines "net zero" as, "producing as much energy from renewable energy sources as is consumed by an installation, limiting the consumption of water in order not to deplete the local watershed, and reducing, re-using, and recovering waste streams so as to add zero waste to landfills."[29]

DOD Energy Management

[26] The requirement applies to the energy used to operate base facilities, not to the fuel used by aircraft, ships or motor vehicles that operate from the base. Moreover, it would not apply to family housing, commissaries, or morale, welfare, and recreational facilities on a base.

[27] The provision stipulates that one of the two installations chosen must be an Air Logistics Center.

[28] FFRDCs are a special type of government-owned, contractor-operated research centers that conduct R&D and related activities in support of a federal agency's mission. For additional information and analysis, see CRS Report R44629, Federally Funded Research and Development Centers (FFRDCs): Background and Issues for Congress, by Marcy E. Gallo.

[29] Government Accountability Office, *Defense Infrastructure: DOD's Efforts Regarding Net Zero Goals*, GAO-16-153R, 2016, p. 1.

For additional background and analysis, see CRS Report R45832, *Department of Defense Energy Management: Background and Issues for Congress*, by Heather L. Greenley.

Climate Change Adaptation

Section 327 requires the Secretary of Defense to submit to Congress an update of its 2014 Climate Change Adaptation Roadmap, which outlined the department's plan to address the potential adverse impact of a changing climate on military plans and operations, training and testing, facilities and infrastructure, and defense acquisition, including the risk to supply chains.[30]

Section 8250 requires the Commandant of the Coast Guard to report to Congress on the impacts of climate change on the Coast Guard, including a list of the 10 most vulnerable installations, as well as an overview of risk mitigation measures and their costs.

Section 328 requires the Secretary of Defense to report to Congress and to GAO the agency's total emission of greenhouse gases in each of the past 10 years, along with breakdowns of emissions resulting from the operation of units in the field (tanks, planes, ships, etc.) and emissions from fixed DOD installations, as well as by military departments.

The Senate-passed S. 4049 included provisions that would have required two DOD reports dealing with impacts of climate change:

- Section 351 would have required the Secretary of Defense to report to Congress on the impact on defense facilities and operations of permafrost thaw.
- Section 354 would have required the Secretary of Defense to report to Congress on the vulnerability of military bases to "extreme weather" and its impact on the requirements of senior U.S. field commanders. Extreme weather is defined as "recurrent flooding, drought, desertification, wildfires, and thawing permafrost."

Neither of those Senate-passed provisions was included in the enacted version of the bill. However, in the Joint Explanatory Statement accompanying the final bill, conferees directed DOD to submit to Congress both reports.

DOD and Climate Change

For additional background and analysis, see CRS Report R41153, *Changes in the Arctic: Background and Issues for Congress*, coordinated by Ronald O'Rourke, CRS Insight IN11566, *Military Installation Resilience: What Does It Mean?*, by G. James Herrera CRS In Focus IF11275, *Military Installations and Sea-Level Rise*, by Margaret Tucker and G. James Herrera; and CRS Report R43915, *Climate Change Adaptation by Federal Agencies: An Analysis of Plans and Issues for Congress*, coordinated by Jane A. Leggett.

PFAS Contamination[31]

PFAS (per- and polyfluoroalkyl substances) are a large, diverse group of fluorinated compounds. They have been used for several decades in numerous commercial, industrial, and U.S. military applications, including use as an ingredient in aqueous film forming foam (AFFF) for

[30] Department of Defense 2014 Climate Change Adaptation Roadmap, https://www.acq.osd.mil/eie/downloads/CCARprint_wForward_e.pdf.

[31] David M. Bearden, Specialist in Environmental Policy, authored this section. For information on PFAS and related issues, contact David M. Bearden at 7-2390, dbearden@crs.loc.gov.

extinguishing petroleum-based liquid fuel fires. Certain PFAS have been detected in drinking water sources, other environmental media, and dairy milk at various locations, some of which have been associated with the use of AFFF at U.S. military installations. DOD has identified known or suspected releases of PFAS at 651 U.S. military installations and National Guard facilities from the past use of AFFF, as of the end of FY2019.[32]

The bill adds to the Trump Administration's authorization request a total of $125 million for research and development related to PFAS and replacements for AFFF:

- $50 million ($25 million each for the Strategic Environmental Research and Development Program and Environmental Security Technology Certification Program) to develop technologies for the disposal of PFAS and remediation of environmental contamination;
- $25 million for the Strategic Environmental Research and Development Program to develop a replacement for AFFF as a suppressant for use against petroleum-based liquid fuel fires (as authorized in Section 334);
- $10 million for the Environmental Security Technology Certification Program to support additional efforts to replace AFFF;
- $20 million (in total from FY2021 through FY2025) for a study of PFAS contained in firefighter protective equipment, exposures, and mitigation of potential risks (as authorized in Section 338);
- $15 million to continue a Centers for Disease Control and Prevention (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR) joint study of the health effects of exposure to PFAS (as authorized in Section 337); and
- $5 million for prizes to be awarded under the Strategic Environmental Research and Development Program for the development of PFAS-free firefighting agents for U.S. military application (as authorized in Section 330).

In addition to funding authorizations, P.L. 116-283 includes several other provisions related to PFAS or AFFF, including:

- Section 318 requires DOD to report the use or spills of AFFF greater than 10 gallons of concentrate, or greater than 300 gallons of mixed foam, and to prepare action plans to mitigate potential risks.
- Section 331 requires DOD to conduct a survey of hangar flooring systems, fire-fighting agent delivery systems, containment systems, and other relevant technologies to facilitate the U.S. military phase-out of AFFF.
- Section 332 directs the White House Office of Science and Technology Policy to establish an interagency working group (including DOD) to coordinate federal research and development activities related to PFAS.
- Section 333 restricts the Defense Logistics Agency (beginning on April 1, 2023) from procuring certain items containing certain specified PFAS chemicals, including nonstick cookware or cooking utensils, and furniture, carpets, and rugs that have been treated with stain-resistant coatings.
- Section 335 requires DOD to notify agricultural operations within 1 mile down gradient of a military installation or National Guard facility where certain

[32] Department of Defense, *Per- and Polyfluoroalkyl Substances (PFAS) Task Force Progress Report*, March 2020, https://media.defense.gov/2020/Mar/13/2002264440/-1/-1/1/PFAS_Task_Force_Progress_Report_March_2020.pdf.

specified PFAS chemicals that originated from a U.S. military installation or National Guard facility were detected in groundwater at certain concentrations or in an agricultural or drinking water source.

PFAS Contamination

For additional information about PFAS and related issues, see CRS Report R45986, *Federal Role in Responding to Potential Risks of Per- and Polyfluoroalkyl Substances (PFAS)*, coordinated by David M. Bearden; CRS Report R45793, *PFAS and Drinking Water: Selected EPA and Congressional Actions*, by Elena H. Humphreys and Mary Tiemann; CRS In Focus IF11219, *Regulating Drinking Water Contaminants: EPA PFAS Actions*, by Mary Tiemann and Elena H. Humphreys; and CRS Report R45998, *Contaminants of Emerging Concern under the Clean Water Act*, by Laura Gatz.

Nuclear Weapons and Delivery Systems

The bill generally supports the Trump Administration's FY2021 budget request to continue modernizing all three legs of the triad of long-range nuclear weapon delivery vehicles – bombers,[33] land-based intercontinental ballistic missiles (ICBMs), and ballistic missile-launching submarines. That policy, articulated in the Trump Administration's Nuclear Posture Review (NPR) released on February 2, 2018, evinced continuity with the plan of the Obama Administration. (See **Table 4**.)

Section 1635 (which is the same as Section 1654 of the Senate bill) prohibits reduction of the number of ICBMs deployed (currently, 400 missiles) and any reduction in their readiness for launch.

Nuclear Arms Modernization

For background and additional analysis, see CRS Report RL33640, *U.S. Strategic Nuclear Forces: Background, Developments, and Issues*, by Amy F. Woolf; and CRS Report RL32572, *Nonstrategic Nuclear Weapons*, by Amy F. Woolf.

Table 4. Selected Long-range, Nuclear-armed Weapons Systems

amounts in millions of dollars

Program (relevant CRS report)	Approp. Type	FY2021 Request	House passed H.R. 6395	Senate passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Columbia-class Ballistic Missile Submarine *(R41129)*	Proc.	4,014.7	4,014.7	4,189.7	4,144.7
	R&D	397.3	397.3	397.3	397.3
D-5 Trident II Missile mods *(RL33640)*	Proc.	1,173.8	1,173.8	1,173.8	1,173.8
	R&D	173.1	173.1	173.1	173.1
Long-Range Standoff Weapon (bomber-launched missile)	R&D	474.4	474.4	474.4	444.4
Ground-based Strategic Deterrent (Minuteman ICBM replacement)	R&D	1,524.8	1,524.8	1,524.8	1,509.8

Sources: H. Rept. 116-442 House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to

[33] The Air Force's long-range (or "strategic") bombers, which can carry either nuclear or conventional weapons, are treated below, in **Table 10**, "Selected Aircraft Programs."

Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Notes: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Specific data sources for this table are listed in Appendix B, **Table B-1**.

Nuclear Weapons Budgeting

Since 1946, civilian agencies independent of DOD have managed the development and manufacture of U.S. nuclear bombs and missile warheads. Since 2000 the National Nuclear Security Agency (NNSA) has filled that role. NNSA is a semi-autonomous component of the Department of Energy that also manages the development of nuclear power plants for warships and oversees U.S. nuclear nonproliferation policy.[34] The FY2021 budget request included $19.8 billion for NNSA, amounting to 56% of the Energy Department budget.[35] This includes $15.6 billion for nuclear weapons activities of which the NDAA authorizes all but $51.6 million of the requested amount.

Section 1632 gives DOD more input over the size and shape of future budgets to develop and manufacture nuclear warheads. The provision requires the Secretary of Energy to send a proposed NNSA budget to the Nuclear Weapons Council – a group of senior DOD officials – before forwarding the budget request to OMB for transmission to Congress. If the DOD panel deems the proposed nuclear weapons budget inadequate, those views would be formally appended to the DOE budget request.

Nuclear Weapons Tests

The bill includes no provision relating to the conduct of explosive tests of U.S. nuclear weapons. Explosive tests of U.S. nuclear weapons have not been done since 1992. Instead, NNSA's nuclear weapons laboratories have relied on computer simulations and experiments using powerful lasers and conventional explosives to test the reliability of nuclear weapons in the U.S. stockpile and to develop improvements for them.[36]

Reportedly, officials within the Trump Administration had discussed the possibility of conducting an explosive nuclear weapons test.[37] During the Senate Armed Services Committee's markup of S. 4049, the committee agreed by a 14-13 party-line vote to include in the bill a provision (Section 3166) that would have made available up to $10 million to reduce the time it would take to carry such a test, if such a decision were made. In the House bill, Section 3121 would have prohibited the use of any funds authorized by the bill to conduct a nuclear weapons test explosion.

Long-range, Precision Strike Weapons

The NDAA generally supports the Trump Administration's proposals to enlarge and diversify the U.S. arsenal of missiles and artillery shells intended to accurately strike targets at ranges of

[34] For additional background and analysis, see CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf and Samuel D. Ryder.

[35] *Budget of the U.S. Government for Fiscal Year 2021*, Office of Management and Budget, p. 123, Table S-8. https://www.govinfo.gov/content/pkg/BUDGET-2021-BUD/pdf/BUDGET-2021-BUD.pdf.

[36] For additional background and analysis, see CRS Report R45306, *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*, by Amy F. Woolf and James D. Werner.

[37] John Hudson and Paul Sonne, "Trump Administration Discussed Conducting First U.S. Nuclear Test in Decades, *Washington Post*, May 22, 2020, https://www.washingtonpost.com/national-security/trump-administration-discussed-conducting-first-us-nuclear-test-in-decades/2020/05/22/a805c904-9c5b-11ea-b60c-3be060a4f8e1_story.html.

several hundred miles and more – up to intercontinental ranges – with conventional (i.e., non-nuclear) warheads. As U.S. strategy has focused more sharply on China and Russia as potential adversaries, DOD has placed increasing emphasis on developing such weapons, partly because those two countries are developing defenses intended to keep U.S. forces at a distance.

Hypersonic Missiles

The bill supports the broad thrust of DOD's efforts to develop several types of long-range, precision-guided missiles that could travel at hypersonic speed – at least five times the speed of sound (in excess of 3,800 mph.). Proponents assert that, compared with ballistic missiles, hypersonic weapons will be more difficult to detect and intercept. Although slower than ballistic missiles, hypersonic missiles are more difficult to intercept because they combine high speed, low flight altitude, and aerodynamic maneuverability.

For the three largest programs of this type – the Army's Long-Range Hypersonic Weapon, the Navy's Conventional Prompt Global Strike, and Air Force's Air-Launched Rapid Response Weapon – the bill authorizes a total of $2.14 billion, $51 million less than was requested. (See **Table 6**.)

The bill also authorizes a total of $24.7 million less than requested for the R&D account to underscore the defense committees' view that DOD has not ensured adequate co-ordination among the various hypersonic weapons development programs.[38]

Hypersonic Missile-related Programs

For additional background and analysis, see CRS Report R45811, *Hypersonic Weapons: Background and Issues for Congress*, by Kelley M. Sayler; and CRS In Focus IF11459, *Defense Primer: Hypersonic Boost-Glide Weapons*, by Kelley M. Sayler and Amy F. Woolf.

For background and analysis on defenses against hypersonic missiles, see CRS In Focus IF11623, *Hypersonic Missile Defense: Issues for Congress*, by Kelley M. Sayler, Stephen M. McCall, and Quintin A. Reed

Table 5. Selected Long-Range Precision-Guided Strike Weapons

amounts in millions of dollars

Program (relevant CRS report)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Hypersonic Missiles					
Conventional Prompt Strike (CPS) (Navy) CRS Report R41464, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues*, by Amy F. Woolf	R&D	1,008.4	1,008.4	956.4	947.4
Long-range Hypersonic Weapon (Army)	R&D	801.4	811.4	796.4	811.4
Air-launched Rapid Response Weapon (Air Force)	R&D	381.9	381.9	446.9	381.9
Other Long-range Precision Land-attack Weapons					
Strategic Long-Range Cannon	R&D	65,1	65.1	65.1	65.1

[38] Section 4201 of H.Rept. 116-617, pp. 2010 and 2037.

Program (relevant CRS report)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Precision Strike Missile (PrSM)	Proc.	49.9	42.4	49.9	49.9
	R&D	122.7	56.6	115.2	107.7
Joint Air to Surface Standoff Missile (JASSM)	Proc.	505.9	505.9	430.9	505.9
	R&D	70.8	70.8	70.8	70.8
Land-attack Tomahawk cruise missile	Proc.	277.7	277.7	277.7	247.9

Source: H. Rept. 116-442 House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S.Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H.Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Notes: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Specific data sources for this table are listed in Appendix B, **Table B-2.**

Missile Defense

The bill challenges DOD's plan to improve the system designed to defend U.S. territory against long-range ballistic missiles. Currently, 44 Ground-Based Interceptor (GBI) missiles are deployed in Alaska and California, each carrying a non-explosive warhead (called a "kill vehicle") intended to collide with an approaching missile warhead in mid-course – thousands of miles from U.S. territory. The GBI design, based on 1990s technology, had a lackluster track record in test intercepts, so DOD began in FY2015 funding development of a Redesigned Kill Vehicle (RKV) to be carried by the existing interceptors.

In August 2019, DOD cancelled the RKV program citing technical problems and resulting delays. Instead, DOD proposed a new, two-pronged approach to improving anti-missile defenses of U.S. territory:

- Instead of trying to improve the already deployed GBIs, DOD would develop a new Next Generation Interceptor (NGI) missile to take on the mission of killing incoming warheads at long-range; and
- Two systems designed to intercept shorter-range ballistic missiles – the Navy's Aegis and the Army's THAAD – would be adapted to serve as a defensive backstop (or "underlay") intended to intercept warheads that evade the first layer of defense (comprising the NGIs). The FY2021 budget request included a total of $178.9 million to adapt those two missiles to that role.

The bill challenges both elements of that plan.

Section 1646 requires DOD to deploy by 2026 an interim national missile defense capability based on improvements to the currently deployed GBI and kill vehicle that would meet the performance goals of the cancelled RKV. The bill requires deployment of 20 such upgraded interceptors. DOD could waive certain requirements if it certifies either that the technical requirements cannot be met, or that the proposed interim system could not be fielded more than two years in advance of deployment of the NGI. Before the final version of the bill was enacted,

OMB had objected that efforts to develop such an interim defense would siphon resources away from the NGI program.[39]

Section 1647 requires that (1) Congress be briefed on any changes in the performance requirements of the NGI; (2) DOD's office of Cost Assessment and Program Evaluation (CAPE) provide an independent cost-estimate of the NGI program; and (3) no decision to begin NGI production be made until the weapon has successfully intercepted a target in at least two flight tests (and DOD has briefed the defense committees on the realism of the tests).

Section 1648 bars DOD's use of 50% of the funding authorized to develop the backstop (or underlay) until the Missile Defense Agency provides to the congressional defense committees a detailed report on the second tier of defenses including performance requirements, cost estimates, and deployment sites. The provision also requires the Defense Intelligence Agency to brief Congress on the likely reaction of potential adversaries to the proposed development of new capabilities for THAAD and Aegis.

The bill authorizes $39.6 million of the $178.2 million requested to develop modifications that would adapt the two missile systems for the underlay mission.[40]

The bill authorizes the amounts requested – or more – for other missile defense program. (See **Table 7.**)

Homeland Missile Defense

For background and additional information, see CRS In Focus IF10541, *Defense Primer: Ballistic Missile Defense*, by Stephen M. McCall.

Table 6. Selected Missile Defense Programs

amounts in millions of dollars

Program (relevant CRS product)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Ground-Based Mid-Course Defense	R&D	1,071.4	986.4	1,071.4	991.4
Next Generation Interceptor	R&D	664.1	414.1	354.1	450.1
Hawaii radar	R&D	0.0	130.0	162.0	65.0
Aegis and Aegis Ashore *(RL33745)*	Proc.	762.8	877.8	890.8	868.8
	R&D	1,042.4	957.4	1,119.2	927.8
Terminal (short-range) defenses [THAAD and Patriot]	Proc.	1,553.2	1,659.2	1,659.6	1,659.6
	R&D	420.4	320.3	420.4	320.4

[39] White House, Office of Management and Budget, Letter to the Chairs and Ranking Members of the House and Senate Armed Services Committees with respect to the National Defense Authorization Act (NDAA) for FY2021 (September 14, 2020), https://www.whitehouse.gov/wp-content/uploads/2020/09/Inhofe.pdf.

[40] Funding requested to modify THAAD and Aegis for the underlay mission is identified in one of the budget justification books for two program elements (usually referred to as "line-items") in the Defense-Wide R&D account. In the budget justification book labelled Defense-Wide Research, Development, Test, and Engineering (RDT&E) Volume 2a, the information for THAAD is on p, 35 and the information for Aegis is on p. 258. (See https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/budget_justification/pdfs/03_RDT_and_E/RDTE_Vol2_MDA_RDTE_PB21_Justification_Book.pdf).

Program (relevant CRS product)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Arrow 3 and Short-range ballistic missile defense (Israeli Co-op)	Proc.	177.7	177.0	177.0	177.0
	R&D	300.0	300.0	300.0	300.0

Sources: H. Rept. 116-442 House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Note: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Data sources for this table are listed in Appendix B, **Table B-3**.

Military Space Systems

In general, the bill supports the budget requests for DOD's major space-related acquisition programs. (See **Table 7**.)

The bill also includes provisions that would support DOD's opposition to a ruling by the Federal Communications Commission (FCC) that would allow Ligado Corp. to begin commercial broadcasts on certain frequencies which – critics contend – would interfere with GPS position-locating devices integral to many types of DOD equipment, including certain precision-guided weapons.

Table 7. Selected Military Space Programs

amounts in millions of dollars

Program (relevant CRS product)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
National Security Space Launch	Proc.	1,043.2	1,043.2	1,043.2	948.2
	R&D	561.0	711.0	591.0	651.0
Global Positioning System III	Proc.	650.2	635.2	650.2	635.2
	R&D	1,147.0	1,127.0	1,062.0	1,064
Infra-red Missile Attack Sensor Satellites (SBIRS and OPIR)	Proc.	160.9	160.9	160.9	160.9
	R&D	2,318.9	2,269.9	2,318.9	2,318.9

Sources: H. Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Note: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Data sources for this table are listed in Appendix B, Table B-4.

DOD Response to FCC's Ligado Ruling

On April 20, 2020, the Federal Communications Commission (FCC) unanimously approved an application by Ligado Networks LLC (Ligado) to "deploy a low-power [9.8 decibel watts (dBW)] terrestrial nationwide network in the 1526-1536 MHz, 1627.5-1637.5 MHz, and 1646.5-1656.5

MHz bands [of the electromagnetic spectrum] that will primarily support Internet of Things (IoT) services."[41] These frequency bands, historically, have been used for satellite operations.

The Department of Defense (DOD) opposed this decision—along with the Department of Homeland Security, Department of Transportation (DOT), Department of the Interior, Department of Justice, the Federal Aviation Administration (FAA), and others. That opposition related to concerns that Ligado's proposed network could interfere with signals from satellites to Global Positioning System (GPS) receivers.[42] However, according to then-Chairman of the FCC Ajit Pai, DOD neither submitted nor attempted to submit the classified study that formed the basis of its concerns to the FCC for consideration.[43]

The FY2021 NDAA includes several provisions bearing on this issue:

- Section 1661 bars DOD from obligating funds to mitigate potential interference with its operations as a result of the Ligado proposal;
- Section 1662 prohibits DOD contract awards to companies engaged in commercial operations that use the frequency bands in question, although the bar could be waived if DOD certifies that these operations create no "harmful interference" with DOD's use of GPS;
- Section 1663 requires an independent technical review of the GPS interference issue by the National Academy of Sciences; and
- Section 1664 bars DOD from obligating funds to comply with the FCC's Ligado ruling until the Secretary submits to the congressional defense committees an estimate of the cost associated with compliance.

In addition, Section 1611 requires the DOD to test and integrate a resilient GPS alternative for position, navigation and timing within two years.

DOD Access to the Electromagnetic Spectrum

For additional background and analysis, see CRS Insight IN11400, *DOD Concerns About the FCC-Approved Ligado Network*, by Kelley M. Sayler and John R. Hoehn; CRS Insight IN11414, *The FCC-Approved Ligado Network and Potential Technical Issues for DOD Use of GPS*, by John R. Hoehn, Stephen M. McCall, and Kelley M. Sayler; and CRS In Focus IF11558, *Spectrum Interference Issues: Ligado, the L-Band, and GPS*, by Jill C. Gallagher, Alyssa K. King, and Clare Y. Cho.

Ground Combat Systems

The bill approves the thrust of the Army's FY2021 budget request continuing what the service describes as a "bold shift" in its priorities,[44] to focus on the potential threat posed by "near-peer

[41] The FCC authorized Ligado to operate an Internet of Things network in certain frequency bands with conditions. Federal Communications Communication Order 20-48, at https://docs.fcc.gov/public/attachments/FCC-20-48A1.pdf.

[42] Testimony of Michael Griffin, Undersecretary of Defense for Research and Engineering, Dana Deasy, DOD Chief Information Officer, Gen John Raymond, Chief of Space Operations, and Thad Allen, Chairman of Space-Based Precision Navigation and Timing National Advisory Board, before the U.S. Congress, Senate Armed Services Committee, *Department of Defense Spectrum Policy and the Impact of the Federal Communications Commission*, 116th Cong., 2nd sess., May 6, 2020.

[43] Letter from FCC Chairman Ajit Pai to Rep. Don Bacon, May 26, 2020, https://docs.fcc.gov/public/attachments/DOC-364591A2.pdf.

[44] Assistant Secretary of the Army (Financial Management and Comptroller), *FY2021 President's Budget Highlights*, https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2021/pbr/Overview%20and%20Highlights/Army_

competitors" – i.e., China and Russia – after more than two decades of engagement in counter-insurgency and counter-terrorist operations. That new focus underpins Army efforts to upgrade or replace the Army's fleets of tanks, artillery, and other weapons.[45]

Army Modernization Plan

For additional background and analysis, see CRS Report R46216, *The Army's Modernization Strategy: Congressional Oversight Considerations*, by Andrew Feickert and Brendan W. McGarry; and CRS In Focus IF11542, *The Army's AimPoint Force Structure Initiative*, by Andrew Feickert.

Table 8. Selected Ground Combat Systems

amounts in millions of dollars

Program (relevant CRS product)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S.4049	Conference Report H.R. 6395 P.L. 116-283
M-1 Abrams Tank upgrades	Proc.	1,425.3	1,406.7	1,425.3	1,412.4
Bradley Infantry Fighting Vehicle upgrades	Proc.	493.1	435.8	473.1	435.8
Stryker troop carrier, upgrades	Proc.	847.2	1,183.1	847.2	1,168.2
Armored Multi-Purpose Vehicle (AMPV) *(IF11741)*	Proc.	193.0	173.0	173.0	139.3
Optionally-Manned Fighting Vehicle *(R45519)*	R&D	327.7	244.7	247.7	244.5
Mobile Protected Firepower [lightweight tank] *(R44968)*	R&D	135.5	135.5	135.5	135.5
Amphibious Combat Vehicle (Marine Corps) *(R42723)*	Proc.	478.9	478.9	478.9	456.3
	R&D	41.8	41.8	41.8	41.8
Paladin 155 mm. self-propelled howitzer	Proc.	435.8	435.8	435.8	435.8
	R&D	427.3	291.0	427.3	291.0
Short-range Missile and Anti-aircraft Defenses					
M-SHORAD [Stryker with anti-aircraft missiles and guns] *(R46463)*	Proc.	537.0	537.0	537.0	532.9
M-SHORAD (DE) [M-SHORAD with anti-aircraft laser] *(R46463)*	R&D	246.5	236.5	246.5	246.5
Indirect Fire Protection Capability (IFPC) *(R46463)*	Proc.	106.3	25.0	65.8	65.5
	R&D	235.8	188.0	188.0	188.0
Iron Dome	Proc	73.0	73.0	73.0	73.0

Sources: H. Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to

FY_2021_Budget_Overview.pdf.

[45] Army programs to develop strike weapons with ranges well in excess of 100 miles are treated above under the heading "Long-range, Precision Strike Weapons." Programs to modernize the Army's helicopter fleet are treated below under the heading "Military Aircraft Programs."

Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Note: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Data sources for this table are listed in Appendix B, **Table B-5**.

Short-Range Air Defense (SHORAD)

The Army's renewed focus on conventional combat with near-peer adversaries is one basis for its proposed investments in relatively short-range defenses against aircraft and short-range missiles.

Through the Cold War, such defense units had been embedded in Army combat forces to fend off the array of ground attack planes and helicopters deployed by the Soviet Union and its Warsaw Pact allies. In the early 2000s, the Soviet threat having vanished, the Army drew down its air defense units, partly because the aerial threat had diminished, and partly because it assumed U.S. Air Force aircraft could provide whatever defense was needed. Meanwhile, the Army shifted some of the manpower and investment that had been dedicated to the air defense mission to combat units deemed more relevant to the counter-insurgency missions in the Middle East and Southwest Asia to which it was committed.[46] By 2010, however, Army leaders concluded that U.S. ground forces faced an increasing risk of air and missile attack from both state and non-state actors and began revitalizing their air defense units.[47]

To keep pace with armor and infantry units moving over the battlefield, the Army developed a version of the Stryker wheeled armored vehicle modified with a turret to carry a radar antenna and various automatic weapons and anti-aircraft missiles. The bill authorizes the FY2021 budget request for $532.9 million to procure 72 of these vehicles, which are designated Maneuver – Short-Range Air Defense (M-SHORAD).

The bill also authorizes the budget request for $246.5 million to develop a variant of M-SHORAD equipped with a laser intended to destroy unmanned aerial systems and artillery shells.

Army Anti-Aircraft Defenses

For additional background and information on the Army's investment in short-range anti-aircraft defenses, see CRS Report R46463, *U.S. Army Short-Range Air Defense Force Structure and Selected Programs: Background and Issues for Congress*, by Andrew Feickert.

Navy Shipbuilding

The bill authorizes a net increase of $3.51 billion to the $19.9 billion budget request for Navy shipbuilding. The largest single addition is $2.55 billion for a second *Virginia*-class submarine, in addition to the one included in the budget request. Funding the second submarine was the top priority in the Navy's list of "unfunded priorities," a document each of the armed services is required to submit to Congress.[48] (See **Table 9**.)

[46] Brig. Gen. Randall McIntire, "The Return of Army Short-Range Air Defense in a Changing Environment," Army Fires Bulletin, November-December 2017; and Gary Sheftick, "Army Rebuilding Short-Range Air Defense," Army News Service, July 3, 2019.

[47] Report to the President and the Congress of the United States, National Commission on the Future of the Army, January 28, 2016, p. 112.

[48] Ben Werner, "Second Virginia Attack Boat Tops Navy's Fiscal Year 2021 Unfunded Priorities List," U.S. Naval Institute News, February 20, 2020, https://news.usni.org/2020/02/20/second-virginia-attack-boat-tops-navys-fiscal-year-2021-unfunded-priorities-list.

Navy Shipbuilding Plans

For additional background an analysis, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke , CRS Testimony TE10057, *Future Force Structure Requirements for the United States Navy*, by Ronald O'Rourke; CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*; and CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*.

Table 9. Selected Shipbuilding Programs

amounts in millions of dollars

Program (relevant CRS report)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
Ford-class aircraft carrier *(RS20643)*	Proc.	2,643.2	2,373.2	2,643.2	2,514.0
Nuclear-powered carrier refueling and modernization *(RS20643)*	Proc.	1,895.8	1,895.8	1,895.8	1,895.8
Virginia-class attack submarine *(RL32418)*	Proc.	4,235.9	6,803.9	4,633.5	6,793.7
DDG-51-class Aegis destroyer *(RL32109)*	Proc.	3,069.6	3,069.6	3,474.6	3,344.6
Frigate (FFX) *(R44972)*	Proc.	1,053.1	954.5	1,053.1	1,053.1
LHA helicopter carrier	Proc.	0.0	0.0	250.0	500.0
LPD amphibious landing transport *(R43543)*	Proc.	1,155.8	1,118.1	1,405.8	1,127.8
Fast Transport Ship (EPF)	Proc.	0.0	260.0	0.0	260.0
Towing and Salvage Ships (ATS)	Proc.	168.2	168.2	168.2	168.2
Small Amphibious Landing Ship (LAW) *(R46374)*	R&D	30.0	30.0	0.0	20.0
Next Generation Logistics Ship *(IF11674)*	R&D	30.0	30.0	0.0	20.0
Large and Medium-sized Unmanned Surface Vessels *(R45757)*	R&D	464.0	270.1	0.0	259.2
Large Unmanned Undersea Vessels *(R45757)*	R&D	234.0	188.0	178.0	178.2

Sources: H. Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Note: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Data sources for this table are listed in Appendix B, **Table B-6**.

The House and Senate Armed Services Committees each have expressed frustration with the Navy's management of its shipbuilding program, citing delays, cost increases and failure of important components of the carrier *U.S.S. Gerald R. Ford* and other ships, each of which was

first of a planned new class. According to then-Senate Armed Services Committee Chairman Sen. Jack Reed and then-Ranking Minority Member Sen. James Inhofe, a fundamental source of frustration is that the Navy has forecast the success of these classes based upon on components using unproven or immature technologies. In the September 2020 issue of the *Proceedings of the U.S. Naval Institute*, the two senators called for developing the critical components (or "subsystems") of planned new design before building the lead ship of a class:

> Without such an approach, we are convinced the cost overruns, schedule delays, and substandard performance that have defined Navy lead-ship development over the past two decades will continue.[49]

Several actions by the conferees on the FY2021 NDAA reflect the Armed Services Committees' insistence that the Navy take a more deliberate approach to designing new ships:

- Section 121 requires, among other things, a report by the Navy on how it plans to implement Section 131 of the FY2020 NDAA (P.L. 116-73) which requires the Navy to fully test in a realistic environment prototypes of the critical subsystems slated for incorporation into the Navy's next planned combat ship, designated the Large Surface Combatant (LSC). In connection with Section 121, the conferees' explanatory statement says, "The conferees believe that prototyping critical subsystems is essential to maturing new technologies and reducing technical risks for lead ships in new classes of naval vessels."
- Section 125 requires the Navy to establish a land-based engineering test site where it can test the propulsion and electrical systems to be installed in a class of Italian-designed frigates the Navy plans to buy beginning with one ship in FY2021. The U.S. ships will be a modified version of the original design, 18 of which have been operated by the Italian and French navies since 2012.

Unmanned Vessels and Testing Requirements

The Armed Services Committees' concern that the Navy was designing new ships around inadequately tested technologies also was a factor in their treatment of the Navy's plan to expand its fleet with a number of relatively large, unmanned surface vessels and submarines. These drone ships, carrying various weapons and sensors, are part of the DOD's plan to offset the improving anti-ship capability of China and other potential adversaries by distributing the striking power of a U.S. force across a larger number of smaller ships that supposedly would be harder to track and target. For FY2021, the Navy budget request included $698.0 million to continue developing various types of unmanned surface and submarine vessels.

In the committee reports to accompany their respective initial versions of the FY2021 NDAA, the House and Senate Armed Services Committees each contended that the there was too much *concurrency* in the Navy's unmanned vessels program. In other words, from the committees' perspective, the Navy allowed different phases of design and development to overlap or occur concurrently. The service was planning to start building new types of ships without having demonstrated that essential components of the vessels would operate reliably, for weeks at a time, without human intervention for maintenance or repair, as is planned (i.e., without fully mature technology, in the committees' view).

[49] Senators Jim Inhofe and Jack Reed, "Prototyping with a Purpose," *United States Naval Institute Proceedings*, September 2020, https://www.usni.org/magazines/proceedings/2020/september/navy-needs-course-correction-prototyping-purpose.

As enacted, the FY2021 NDAA authorizes $437.5 million, slightly less than two-thirds of the amount requested. The bill includes certain provisions:

- Section 122 provides that no program to acquire a medium or large unmanned surface ship may move into the last stage of R&D before full-scale production, until it has been demonstrated that the main propulsion system and electrical system have operated under realistic circumstances for at least 30 days nonstop (i.e., "720 hours") without requiring any maintenance or repair.
- Section 227 provides that no contract for the purchase of a medium or large-sized unmanned surface vessel can be signed until 30 days after the Navy certifies to Congress that the critical components of the ship have been demonstrated, in realistic tests, that they meet the performance specifications of the design. This provision also prohibits the installation on such ships of offensive weapons until the Secretary of Defense certifies to the defense committees:
    - that the ships would operate in accord with the law of armed conflict, and explains how this would be assured; and
    - that the proposed unmanned vessel is deemed by the Secretary of Defense to be the most appropriate vessel for the mission envisaged on the basis of a detailed analysis of alternative ways of performing the mission.

Navy Plans for Unmanned Surface and Vessels

For additional information and analysis on the U.S. Navy's plans to develop and deploy unmanned surface and sub-surface ships, see CRS Report R45757, Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress, by Ronald O'Rourke.

Smaller Amphibious Landing and Supply Ships

Conferees on the FY2021 NDAA expressed support, in general terms, for a Marine Corps plan to organize relatively small, self-contained combat units equipped with Tomahawk anti-ship cruise missiles that would operate in the Western Pacific to challenge Chinese attempts to control its adjacent seas.[50] However, the bill authorized less than was requested to develop two new types of relatively small ships intended to support the plan and the conferees directed the Navy to provide more detail on the ships and other equipment the plan would require.

Under the new approach, relatively small Marine Corps units would be shuttled among the many islands that border the East China Sea and South China Sea on a new type of vessel designated the Light Amphibious Warship (LAW), which would be much smaller than the relatively large ships that currently comprise the Navy's amphibious landing force. The plan assumes that LAWs and a new class of similar-sized supply ships (designated Next Generation Logistics Ships or NGLS) would survive partly by evading detection amidst the islands and other shipping and partly by cover provided by other U.S. forces.

The budget request included $30 million to develop the LAW and another $30 million to develop the support ship. The bill authorizes $20 million for each of the two projects.

The original House-passed version of H.R. 6395 included Section 1028 which would have required the Secretary of Defense to submit to Congress a report on plans to implement the Marines' new approach, including the role of the proposed new ship types. The enacted FY2021

[50] See China-focused Initiatives, on p. 6, supra.

NDAA included no such provision; however, in the accompanying explanatory statement, conferees directed the Navy to provide the defense committees with a similar report.[51]

Small Amphibious Landing and Supply Ships

For additional Information and analysis, see CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiatives*, by Andrew Feickert; CRS Report R46374, *Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress*, by Ronald O'Rourke; and CRS In Focus IF11674, *Navy Next-Generation Logistics Ship (NGLS) Program: Background and Issues for Congress*, by Ronald O'Rourke.

Military Aircraft Programs

The amounts authorized by the bill for acquisition of military aircraft generally support DOD's long-term aviation modernization plan announced in April 2018, which, in turn, is linked to the 2018 National Defense Strategy.[52] (See **Table 10**.)

One substantial departure from the budget request incorporated in the bill is a net increase of $831.0 million for procurement associated with the F-35 Joint Strike Fighter, to fund the purchase of 93 aircraft rather than the 79 requested.

The bill also authorizes unrequested funds to continue through FY2022 programs that DOD had planned to terminate in FY2021. In addition to the amounts requested, the bill authorizes:

- $136.0 million for five CH-47 heavy-lift cargo helicopters for the Army plus $29.0 million for components to be used in CH-47s funded in FY2022; and
- $28.1 million for components to be used in F/A-18E/F Navy fighters procurement in FY2022.

Military Aircraft Procurement Plan

For additional background, see CRS In Focus IF10999, *Defense's 30-Year Aircraft Plan Reveals New Details*, by Jeremiah Gertler.

Table 10. Selected Aircraft Programs

amounts in millions of dollars

Program (relevant CRS report)	Approp. Type	FY2021 Request	House-passed H.R. 6395	Senate-passed S. 4049	Conference Report H.R. 6395 P.L. 116-283
B-21 new stealth bomber *(R44463)*	Proc,		20.0		
	R&D	2,848.4	2,848.4	2,848.4	2,848.4
Bomber upgrades *(IN11413)*	Proc.	111.1	59.4	106.7	81.4
	R&D	723.2	541.7	734.0	684.8
F-35 (all versions) and mods *(RL30563)*	Proc.	9,683.6	9,177.2	10,985.8	10,514.6
	R&D	1,717.2	1,551.8	1,717.2	1714.6

[51] Conference Report p. 1753

[52] See *Annual Aviation Inventory and Funding Plan, Fiscal Years 2019-48,* https://apps.dtic.mil/dtic/tr/fulltext/u2/1062648.pdf. Congress repealed the legislative requirement for this annual 30-year plan in the FY2019 NDAA (P.L. 115-232).

F-15 and mods *(IF11521)*	Proc.	1,784.6	1,779.8	1,784.6	1,732.2
	R&D	629.4	614.6	629.3	629.3
F/A-18E/F and mods *(RL30624)*	Proc.	2,975.8	3,003.9	2,975.8	2,885.7
	R&D	361.4	365.4	361.4	365.4
F-22 mods	Proc.	393.8	367.6	393.8	367.6
	R&D	665.0	648.9	665.0	648.9
Next Generation Air Dominance (NGAD) *(IF11659)*	R&D	1,044.1	1,044.1	1,044,1	974.1
KC-46 mid-air refueling tanker *(RL34398)*	Proc.	2,850.2	2,189.2	2,850.2	2.707.8
	R&D	106.3	86.3	106.3	86.3
MQ-4 Triton/RQ-4 Global Hawk UAV	Proc.	204.0	334.0	154.0	266.8
	R&D	361.2	361.2	361.2	361.2
MQ-25 Stingray aircraft carrier-borne UAV	R&D	267.0	267.0	267.0	267.0
UH-60 troop-transport helicopter, new and rebuilt	Proc.	1,003.2	985.5	1,003.2	985.5
AH-64 Apache attack helicopters	Proc.	1,030.6	1,025.8.	1,030.6	1,030.6
CH-47 Chinook cargo-carrying helicopters	Proc.	229.6	364.7	229.6	394.6
Future Attack and Reconnaissance Aircraft (FARA) [attack helicopter] *(IF11367)*	R&D	513.5	513.5	513.5	513.5
Future Long-Range Assault Aircraft (FLRAA) [troop transport helicopter] *(IF11367)*	R&D	134.4	134.4	139.4	139.4

Sources: H. Rept. 116-442, House Armed Services Committee, Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021; S. Rept. 116-236, Senate Armed Services Committee, Report to Accompany S. 4049, National Defense Authorization Act for FY2021; H. Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021.

Note: Entry in "Approp. Type" column indicates whether funds are authorized for procurement (Proc.) or Research and Development (R&D). Data sources for this table are listed in Appendix B, **Table B-7**.

Objecting to Proposed Aircraft Retirements

The bill reflects conferees' skepticism of DOD proposals to retire for budgetary reasons some aircraft currently in service. The DOD plan was to use funds that would be required for the operation and maintenance of the older aircraft instead for the development of new types of aircraft (or other technologies) which – it was hoped – would more effectively perform the missions of the planes being retired.

In the explanatory statement accompanying the bill, conferees said:

> The conferees are frustrated that the Air Force consistently implements a strategy to accept increased operational risk by divesting legacy aircraft capacity to address replacement program unplanned cost growth, Conferees have historically expressed concern …that the

> divestment of legacy aircraft traditionally does not yield sufficient resources to fund modernization.[53]

Section 131 requires the Air Force to sustain a force of 386 operational squadrons[54] comprising no fewer than 3,580 combat-ready aircraft (that is, excluding trainers and test aircraft). The Secretary of Defense could request a modification of those numbers by reporting to the congressional defense committees that new technologies allow a smaller force to meet the Joint Chiefs of Staff criteria of "moderate operational risk".

The bill also includes several provisions inhibiting DOD's ability to retire certain types of aircraft subject to various detailed conditions. The limitations are applied to bombers (Sections 132 and 133), tactical cargo airplanes (Section 134), mid-air refueling tankers (Section 135), battlefield reconnaissance aircraft (Sections 139 and 140), and A-10 ground attack aircraft (Section 1057).

[53] H.Rept. 116-617, Conference Report to Accompany H.R. 6395, National Defense Authorization Act for FY2021, p. 1539.

[54] That number, based on the Air Force's analysis of the National Defense Strategy, was featured in an internal Air Force study entitled "The Air Force We Need" described by then-Secretary of the Air Force Heather Wilson in 2018, when the service fielded 312 squadrons of aircraft. https://www.af.mil/News/Article-Display/Article/1635070/the-air-force-we-need-386-operational-squadrons/.

Appendix A. Other CRS Products Cited in this Report

Reports

CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program*, by Jeremiah Gertler

CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL33640, *U.S. Strategic Nuclear Forces: Background, Developments, and Issues*, by Amy F. Woolf

CRS Report RL33745, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report RL34398, *Air Force KC-46A Pegasus Tanker Aircraft Program*, by Jeremiah Gertler

CRS Report R41129, *Navy Columbia (SSBN-826) Class Ballistic Missile Submarine Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R41153, *Changes in the Arctic: Background and Issues for Congress*, coordinated by Ronald O'Rourke

CRS Report R41464, *Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues*, by Amy F. Woolf

CRS Report R42723, *Marine Corps Amphibious Combat Vehicle (ACV): Background and Issues for Congress*, by Andrew Feickert

CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R43240, *The Army's Armored Multi-Purpose Vehicle (AMPV): Background and Issues for Congress*, by Andrew Feickert

CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke

CRS Report R44039, *The Defense Budget and the Budget Control Act: Frequently Asked Questions*, by Brendan W. McGarry

CRS Report R44381, *Intelligence Community Spending: Trends and Issues*, by Michael E. DeVine

CRS Report R44321, *Diversity, Inclusion, and Equal Opportunity in the Armed Services: Background and Issues for Congress*, by Kristy N. Kamarck

CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf and Samuel D. Ryder

CRS Report R44463, *Air Force B-21 Raider Long-Range Strike Bomber*, by Jeremiah Gertler

CRS Report R44519, *Overseas Contingency Operations Funding: Background and Status*, by Brendan W. McGarry and Emily M. Morgenstern

CRS Report R44629, *Federally Funded Research and Development Centers (FFRDCs): Background and Issues for Congress*, by Marcy E. Gallo

CRS Report R44891, *U.S. Role in the World: Background and Issues for Congress*, by Ronald O'Rourke and Michael Moodie

CRS Report R44968, *Infantry Brigade Combat Team (IBCT) Mobility, Reconnaissance, and Firepower Programs*, by Andrew Feickert

CRS Report R44972, *Navy Constellation (FFG-62) Class Frigate (Previously FFG[X]) Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R45306, *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*, by Amy F. Woolf and James D. Werner

CRS Report R45400, *Impact Aid, Title VII of the Elementary and Secondary Education Act: A Primer*, by Rebecca R. Skinner

CRS Report R45519, *The Army's Optionally Manned Fighting Vehicle (OMFV) Program: Background and Issues for Congress*, by Andrew Feickert

CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R45811, *Hypersonic Weapons: Background and Issues for Congress*, by Kelley M. Sayler

CRS Report R46336, *COVID-19: Potential Implications for International Security Environment—Overview of Issues and Further Reading for Congress*, by Ronald O'Rourke, Kathleen J. McInnis, and Michael Moodie

CRS Report R46374, *Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS Report R46463, *U.S. Army Short-Range Air Defense Force Structure and Selected Programs: Background and Issues for Congress*, by Andrew Feickert

In Focus

CRS In Focus IF10524, *Defense Primer: Budgeting for National and Defense Intelligence*, by Michael E. DeVine

CRS In Focus IF11459, *Defense Primer: Hypersonic Boost-Glide Weapons*, by Kelley M. Sayler and Amy F. Woolf

CRS In Focus IF11558, *Spectrum Interference Issues: Ligado, the L-Band, and GPS*, by Jill C. Gallagher, Alyssa K. King, and Clare Y. Cho

CRS In Focus IF11623, *Hypersonic Missile Defense: Issues for Congress*, by Kelley M. Sayler, Stephen M. McCall, and Quintin A. Reed

CRS In Focus IF11659, *Air Force Next-Generation Air Dominance Program: An Introduction*, by Jeremiah Gertler

CRS In Focus IF11674, *Navy Next-Generation Logistics Ship (NGLS) Program: Background and Issues for Congress*, by Ronald O'Rourke

CRS In Focus IF11741, *The Army's Armored Multi-Purpose Vehicle (AMPV)*, by Andrew Feickert

Insight

CRS Insight IN10931, *U.S. Army's Initial Maneuver, Short-Range Air Defense (IM-SHORAD) System*, by Andrew Feickert

CRS Insight IN11414, *The FCC-Approved Ligado Network and Potential Technical Issues for DOD Use of GPS*, by John R. Hoehn, Stephen M. McCall, and Kelley M. Sayler

CRS Insight IN11400, *DOD Concerns About the FCC-Approved Ligado Network*, by Kelley M. Sayler and John R. Hoehn

Congressional Testimony

CRS Testimony TE10057, *Future Force Structure Requirements for the United States Navy*, by Ronald O'Rourke

Appendix B. Procurement and R&D Budget Data Sources for Authorization Tables

Tables 4-10 of this report summarize the amounts requested by the Administration, and recommended by the House and Senate for procurement and/or research and development (R&D) regarding selected weapons programs in each of several broad categories, e.g., missile defense, ground combat, etc. The funding data for these selected programs is drawn from 17 procurement appropriation accounts and five R&D accounts that are components of the DOD budget. Each of those accounts is further subdivided into "line items" – dozens of them in some procurement accounts, and hundreds of them in most of the R&D accounts.

The official DOD labels of some line items may not correspond to the names that commonly are used to refer to programs in the course of congressional deliberations. Moreover, funding for a single program may be spread across several line items. In addition, R&D funding for a particular program may be only one of several projects funded by a single line item.

Each of the following appendix tables identifies the data sources for each program in the corresponding funding table in the body of this report. In each appendix table, each program is listed along with the line item or items associated with the program to calculate the amounts listed in the corresponding funding table.

The line items are identified by appropriations account, line number within that account, and the label by which the line item is identified in DOD budget documents and in the committee reports to accompany the House and Senate versions of the FY2021 NDAA. In most cases, those amounts can be reviewed in the committee reports or in one of two DOD Comptroller budget summary documents: *Procurement Programs (P-1)* available at https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021_p1.pdf, or *RDT&E Programs (R-1)* available at https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2021/fy2021_r1.pdf.

In a relatively small number of cases, the funding table amount incorporates only the funds associated with one of several projects within a line item. In those cases, the relevant line item component is listed in italics in the appendix table. Those amounts can be reviewed by consulting the detailed budget justification books that are available on the DOD Comptroller's web-site at https://comptroller.defense.gov/Budget-Materials/.

Table B-1. Selected Long-range, Nuclear-armed Weapons Systems

Program Label in CRS table	Approp. acct.	Line # *project i.d.*	Label in DOD documents and Congressional Funding Tables
Columbia-class Ballistic Missile Submarine	SCN	1	Ohio Replacement Submarine
		2	Ohio Replacement AP
		52	Ohio Replacement
	RDT&E, N	47 *proj: 3219*	Advanced Nuclear Power Systems
D-5 Trident II missile mods	WPN	1	Trident II Mods
	RDT&E, N	204	Strat. Sub & Weapons Syst. Suppt.
Long-Range Standoff Weapon	RDT&E, F	097	Long-Range Standoff Weapon

Program Label in CRS table	Approp. acct.	Line # *project i.d.*	Label in DOD documents and Congressional Funding Tables
Ground-Based Strategic Deterrent	RDT&E, F	057	Ground Based Strategic Deterrent

Note: Glossary of appropriation account acronyms is included in Table B-8.

Table B-2. Long-range Precision Strike Weapons

Label in CRS table	Approp. acct.	Line # *project i.d.*	Label in DOD documents
Conventional Prompt Strike	RDT&E, N	91 *proj: 3334*	Precision Strike Weapons Dev. Prog.
		165	DDG-1000
Long-Range Hypersonic Weapon (Army)	RDT&E, A	109	Hypersonics
Air-Launched Rapid Response Weapon (AF)	RDT&E, F	48	Hypersonics prototyping
Strategic Long-Range Cannon	RDT&E, A	102 *proj: AY3*	Technology Maturation Initiatives
Precision Strike Missile (PrSM)	MPA	4	Precision Strike Missile (PRSM)
	RDT&E, A	219	Long Range Precision Fires (LRPF)
Joint Air to Surface Standoff Missile (JASSM)	MPF	4	Joint Air-to-Surface Standoff Missile
	RDT&E, F	200	Joint Air-to-Surface Standoff Missile
Land-attack Tomahawk cruise missile	WPN	3	Tomahawk

Note: Glossary of appropriation account acronyms is included in Table B-8.

Table B-3. Missile Defense Programs

Label in CRS table	Approp. acct.	Line #	Label in DOD documents
Ground-Based Mid-Course Defense	RDT&E, DW	77	Ballistic Missile Defense Midcourse Segment
		116	Ballistic Missile Defense Midcourse Segment Test
Next Generation Interceptor	RDT&E, DW	111	Improved Homeland Defense Interceptors
Hawaii Radar	RDT&E, DW	105	Homeland Defense Radar -- Hawaii
Aegis and Aegis Ashore	PDW	34	Aegis BMD
		35	Aegis BMD AP
		36	AN/TPY-2 radar
		37	SM-3 IIAS
		40	Aegis Ashore Phase III
		42	Aegis BMD Hardware and Software
	RDT&E, DW	82	Aegis BMD

Label in CRS table	Approp. acct.	Line #	Label in DOD documents
		113	Aegis BMD Test
		115	Land-based SM-3
Terminal (short-range) defenses – [THAAD and Patriot]	PDW	31	THAAD
	MPA	36	AN/TPY-2 radars
		3	MSE Missile [Patriot]
		3 oco	MSE Missile
		16	Patriot Mods
	RDT&E, DW	76	Ballistic Missile Defense – Terminal Defense Segment
		112	Ballistic Missile Defense – Terminal Defense Segment Test
Arrow 3 and Short-range ballistic missile defense (Israeli Co-op)	PDW	38	Arrow III Upper Tier Systems
		39	Short Range Ballistic Missile Defense
	RDT&E, DW	88	Israeli Cooperative Programs

Notes:

a. Glossary of appropriation account acronyms is included in Table B-8.

b. Line numbers in Overseas Contingency Operation (OCO) accounts are listed with the line number followed by "oco".

Table B-4. Military Space Programs

Label in CRS table	Approp. acct.	Line #	Label in DOD documents
National Security Space Launch	PSF	13	National Security Space Launch
	RDT&E, SF	20	National Security Space Launch
Global Positioning System III	PSF	6	GPSIII follow-on
		7	GPS III Space Segment
		8	Global Positioning (Space)
	RDT&E, SF	2	NAVSTAR Global Positioning System (User Equipment)
		12	GPS III Follow-on (GPS IIIF)
		33	GPS III Space Segment
		37	Global Positioning System III -- Operational Control Segment
Infra-red Missile Attack Sensor Satellites *(SBIRS-High and follow-on)*	PSF	11	SBIR High (Space)
	RDT&E, SF	19	Next Generation OPIR

Note: Glossary of appropriation account acronyms is included in Table B-8.

Table B-5. Selected Ground Combat Systems

Label in CRS table	Approp. acct.	Line # *project i.d.*	Label in DOD documents
M-1 Abrams tank upgrades	W&TCV	13	M-1 Abrams tank (Mod)
	W&TCV	14	Abrams Upgrade Program
Bradley Infantry Fighting Vehicle upgrades	W&TCV	5	Bradley Program (Mod)
Stryker troop carrier, upgrades	W&TCV	4	Stryker Upgrade
Armored Multi-purpose Vehicle (AMPV)	W&TCV	2	Armored Multi-purpose Vehicle (AMPV)
Optionally-manned Fighting Vehicle	RDT&E, A	176	Manned Ground Vehicle
Mobile Protected Firepower *[lightweight tank]*	RDT&E, A	127	Armored Systems Modernization (ASM) – Engineering Development
Amphibious Combat Vehicle	PMC	2	Amphibious Combat Vehicle Family of Vehicles
	RDT&E, N	163	Marine Corps Assault Vehicles System Development and Demonstration
Paladin 155 mm. self-propelled howitzer	W&TCV	7	Paladin Integrated Management (PIM)
	RDT&E, A	234	155MM self-propelled howitzer improvements
M-SHORAD [*Stryker with antiaircraft missiles and guns]*	MPA	2	M-SHORAD Procurement
		2 oco	M-SHORAD Procurement
M-SHORAD (DE) [*Stryker with anti-aircraft laser]*	RDT&E, A	169 *FI3*	Emerging Technology Initiatives
Indirect Fire Protection Capability (IFPC)	MPA	5	Indirect Fire Protection Capability
	RDT&E, A	167	Indirect Fire Protection Capability, Inc 2 – Block 1
Iron Dome	PDW	41	Iron Dome

Notes:

a. Glossary of appropriation account acronyms is included in Table B-8.

b. Line numbers in Overseas Contingency Operation (OCO) accounts are listed with the line number followed by "oco".

Table B-6. Selected Shipbuilding Programs

Label in CRS table	Approp. acct.	Line # *proj. i.d.*	Label in DOD documents
Ford-class aircraft carrier	SCN	3	Carrier replacement program
		4	CVN-81
Nuclear-powered carrier refueling and modernization	SCN	7	CVN refueling overhauls
		8	CVN refueling overhauls AP

Label in CRS table	Approp. acct.	Line # *proj. i.d.*	Label in DOD documents
Virginia-class attack submarine	SCN	5	Virginia Class Submarine
		6	Virginia Class Submarine AP
DDG-51-class Aegis destroyer	SCN	10	DDG-51
		11	DDG-51 AP
Frigate	SCN	13	FFG Frigate
LHA helicopter carrier	SCN	17	LHA replacement
LPD amphibious landing transport	SCN	14	LPD Flight II
		15	LPD AP
Fast Transport Ship (EPF)	SCN	19	Expeditionary Fast Transport Ship (EPF)
Towing and Salvage Ships	SCN	22	Towing, Salvage, and Rescue Ships
Small Amphibious Landing Ship	RDT&E, N	45 *proj. 4044*	Ship Concept Advanced Design
Next Generation Logistics Ship	RDT&E, N	45 *proj. 4045*	Ship Concept Advanced Design
Large and Medium-Sized Unmanned Surface Vessels	RDT&E, N	27	Medium and Large Unmanned Surface Vehicles
Large Unmanned Undersea Vessel	RDT&E, N	78	Unmanned undersea vehicles (core technologies)
		80	Large Unmanned Undersea Vehicles
		89	Advanced Undersea Prototyping

Note: Glossary of appropriation account acronyms is included in Table B-8.

Table B-7. Selected Aircraft Programs

Label in CRS table	Approp. acct.	Line # *proj. i.d.*	Label in DOD documents
B-21 new stealth bomber	RDT&E, F	46	Long Range Strike -- Bomber
Bomber Upgrades	APF	22	[Mods] B-1
		23	[Mods] B-2A
		24	[Mods] B-1B
		25	[Mods] B-52
	RDT&E, F	172	B-52 Squadrons
		174	B-1B Squadrons
		175	B-2 Squadrons
F-35 (all versions) and mods	APN	3	Joint Strike Fighter CV
		4	Joint Strike Fighter CV AP
		5	JSF STOVL

Label in CRS table	Approp. acct.	Line # *proj. i.d.*	Label in DOD documents
		6	JSF STOVL AP
		62	[mods] F-35 STOVL Series
		63	[mods] F-35 CV Series
		1	F-35
	APF	2	F-35 AP
		33	F-35 Modifications
		148	Joint Strike Fighter EMD
	RDT&E, N	149	Joint Strike Fighter EMD
		200	F-35 C2D2
		201	F-35 C2D2
	RDT&E, F	96	F-35 EMD
		191	f-35 Squadrons
F-15 and mods	APF	4	F-15 EX
		5	F-15 EX AP
		29	[mods] F-15
		34	[mods] F-15 EPAW
		106	F-15 EPAWSS
	RDT&E, F	188	F-15E Squadrons
		192	F-15EX
F/A-18E/F and mods	APN	1	F/A-18E/F (Fighter) Hornet
		2	F/A-18 AP
		28	F-18 A-D unique
		29	F-18E/F and EA-18G modernization and sustainment
		32	Infra-red search and track
		34	F-18 series
	RDT&E, N	75	F/a-18 Infrared Search and Track
		112	EA-18
		208	F/A-18 Squadrons
F-22 mods	APF	32	[mods] F-22A
		35	Increment 3.2B
	RDT&E, F	190	F-22A Squadrons
Next Generation Air Dominance (NGAD)	RDT&E, F	59	Next Generation Air Dominance
KC-46 mid-air refueling tanker	APF	7	KC-46A MDAP
	RDT&E, F	111	KC-46A Tanker Squadrons
	APN	21	MQ-4 Triton

Label in CRS table	Approp. acct.	Line # *proj. i.d.*	Label in DOD documents
MQ-4 Triton/RQ-4 Global Hawk UAV		65	[mods] MQ-4 series
	APF	65	RQ-4 mods
	RDT&E, N	244	MQ-4C Triton
		252	RQ-4 modernization
	RDT&E, F	270	RQ-4 UAV
		272	NATO AGS
MQ-25 Stingray aircraft carrier-borne UAV	RDT&E, N	159	Unmanned carrier aviation
UH-60 troop-transport helicopter, new and rebuilt	APA	11	UH-60 Blackhawk M Model (MYP)
		12	UH-60 Blackhawk M Model (MYP) AP
		13	UH-60 Black Hawk L and V models
AH-64 Apache attack helicopter	APA	7	AH-64E Apache Block IIIA Reman
		8	AH-64E Apache Block IIIA Reman AP
CH-47 Chinook cargo-carrying helicopter	APA	14 14 oco	CH-47 helicopter CH-47
		15	CH-47 helicopter AP
Future Attack and Reconnaissance Aircraft (FARA) [attack helicopter]	RDT&E, A	90 *F12*	Aviation – Advanced Development
Future Long-Range Assault Aircraft (FLRAA) [troop transport helicopter]	RDT&E, A	90 *B47*	Aviation – Advanced Development

Note: Glossary of appropriation account acronyms is included in Table B-8.

Table B-8. Glossary of Appropriations Account Acronyms in This Appendix

acronym	Appropriations Title	acronym	Appropriations Title
APA	Aircraft Procurement, Army	RDT&E, A	Research, Development, Test & Evaluation, Army
APF	Aircraft Procurement, Air Force	RDT&E, DW	Research, Development, Test & Evaluation, Defense-wide
APN	Aircraft Procurement, Navy	RDT&E, F	Research, Development, Test & Evaluation, Air Force
MPA	Missile Procurement, Army	RDT&E, N	Research, Development, Test & Evaluation, Navy
MPF	Missile Procurement, Air Force	RDT&E, SF	Research, Development, Test & Evaluation, Space Force
PDW	Procurement, Defense-wide	SCN	Shipbuilding and Conversion, Navy
PMC	Procurement, Marine Corps	W&TCV	Weapons and Tracked Combat Vehicles, Army
PSF	Procurement, Space Force	WPN	Weapons Procurement, Navy

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