Congressional Budget Office
Nonpartisan Analysis for the U.S. Congress

An Analysis of the Navy's Fiscal Year 2022 Shipbuilding Plan

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In June 2021, the Department of Defense submitted to the Congress the Navy's 30-year shipbuilding plan for fiscal year 2022.[1] The Congressional Budget Office is required by law to analyze that plan and assess its costs. The agency's assessment is the subject of this report. In its 2022 plan, the Navy provided less information than it has in most previous plans; CBO's analysis was limited to the information that the Navy provided.

- **Fleet Size.** Under the 2022 plan, the Navy's fleet would grow from 296 manned ships today to between 398 and 512 manned ships and unmanned vessels at some unspecified date in the future. The number of manned ships would increase to between 321 and 372, and the inventory of unmanned surface and undersea vessels would rise from just a few prototypes today to between 77 and 140.
- **Cost.** CBO estimates that the cost of shipbuilding for a fleet of 398 to 512 manned ships and unmanned vessels as envisioned in the 2022 plan would be about $25 billion to $33 billion (in 2021 dollars) per year, over 30 years, compared with an average of about $23 billion per year over the past five years.
- **Missile Capacity.** A key implication of the Navy's plan is that it would reduce the number of vertical launch system (VLS) cells, which provide the main missile capability on surface ships, but increase the number of manned ships and unmanned vessels capable of carrying them. The size of the reduction could be as little as a few hundred missiles or as many as a few thousand depending on the number of ships and unmanned systems in the future fleet and their capacity for carrying missiles. The number of ships and vessels capable of carrying missiles, however, could increase by nearly 70 percent, posing a much harder targeting problem for an opposing fleet.

Background

The Congress requires the Navy to submit with its budget a shipbuilding plan that describes the annual inventory, purchases, deliveries, and retirements of the ships in its fleet over the next 30 years. The Navy's 2022 plan discussed, in broad terms, how the fleet should evolve in coming decades to meet the nation's national security challenges. However, it omitted many details that are found in previous plans, including all of the annual long-term projections. The plan also omitted any discussion of costs, other than the budget request for the ships the Navy would purchase in 2022.

As of August 2021, the Navy's fleet numbered 296 battle force ships—aircraft carriers, submarines, surface combatants, amphibious warfare ships, combat logistics ships, and some support ships. It does not yet include substantial numbers of unmanned surface or undersea vessels, although the Navy is researching and experimenting with a number of prototype systems.

The Navy Plans to Expand and Diversify Its Fleet

In its 2022 plan, the Navy envisions a future fleet that is different—both in total fleet size and composition—from today's fleet and from its own recent assessments of the future fleet (see Table 1). In a single appendix table, the

1. See Department of the Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2022* (June 2021), https://go.usa.gov/xMjGr (PDF, 706 KB).

Notes: Unless this report indicates otherwise, all years referred to are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end; all dollar amounts reflect budget authority in 2021 dollars. In this report, "cost" refers to budget authority, the amount that would need to be appropriated to implement the Administration's plans. Numbers in the text and tables may not add up to totals because of rounding.

Table 1.

The Navy's Inventory Goals, 2016 to 2021

	Number of Platforms					
	2016 Force Structure Assessment	2020 Future Naval Forces Study	2022 Shipbuilding Plan	Today's Fleet	Difference Between Today's Fleet and 2022 Shipbuilding Plan	Memorandum: Change From Today's Fleet to 2022 Shipbuilding Plan (Percent)
Aircraft Carriers	12	8 to 11	9 to 11	11	-2 to 0	-18 to 0
Light Carriers	n.a.	0 to 6	n.a.	0	n.a.	n.a.
Submarines						
Ballistic missile	12	12	12	14	-2	-14
Attack, guided missile, and large payload	66[a]	72 to 78[a]	66 to 72[b]	54	12 to 18	22 to 33
Large Surface Combatants	104	73 to 88	63 to 65	92	-29 to -27	-32 to -29
Small Surface Combatants and Mine Countermeasures Ships[c]	52	60 to 67	40 to 45	31	9 to 14	29 to 45
Amphibious Warfare Ships						
LHDs and LHAs	38[d]	9 to 10	8 to 9	9	-1 to 0	-11 to 0
LPDs and LSDs		52 to 57[e]	16 to 19	22	-6 to -3	-27 to -14
Small amphibious warfare ships	0		24 to 35	0	24 to 35	n.a.
Subtotal, combat ships	284	286 to 329	238 to 268	233	5 to 35	2 to 15
Combat Logistics Ships	32	69 to 87	56 to 75	29	27 to 46	93 to 159
Support Ships	39	27 to 30	27 to 29	34	-7 to -5	-21 to -15
Subtotal, logistics and support ships	71	96 to 117	83 to 104	63	20 to 41	32 to 65
Total Manned Battle Force Ships	**355**	**382 to 446**	**321 to 372**	**296**	**25 to 76**	**8 to 26**
Unmanned Surface Vessels	n.a.	119 to 166	59 to 89	0	59 to 89	n.a.
Unmanned Undersea Vessels	n.a.	24 to 76	18 to 51	0	18 to 51	n.a.
Total Unmanned Vessels	**n.a.**	**143 to 242**	**77 to 140**	**0**	**77 to 140**	**n.a.**
Total Manned Battle Force Ships and Unmanned Vessels	**355**	**525 to 688**	**398 to 512**	**296**	**102 to 216**	**34 to 73**

Data source: Congressional Budget Office, using data from the Department of the Navy. See www.cbo.gov/publication/57414#data.

LHA and LHD = amphibious assault ship; LPD = amphibious transport dock; LSD = dock landing ship; n.a. = not applicable.

a. The Navy did not provide goals for guided missile or large payload submarines.

b. The Navy counted attack submarines and future large payload submarines together. Under previous shipbuilding plans, the Navy would begin building large payload submarines in the 2040s. They would probably have a mission similar to that of the guided missile submarines in today's fleet, which are converted ballistic missile submarines.

c. The Navy counts its current force of small surface combatants and dedicated mine countermeasures ships together and does not plan to replace the mine countermeasures ships.

d. The Navy did not distinguish between the types of amphibious ships, and no small amphibious warfare ships were under consideration when the 2016 Force Structure Assessment was undertaken.

e. The Navy did not distinguish between LPD, LSD, and small amphibious warfare ships.

Navy outlines an "objective" battle force (the Navy's goals for the future fleet) of 321 to 372 manned ships. That is larger than today's battle force of 296 ships (all of them manned), but smaller than that envisioned in the 2020 Future Naval Forces Study (FNFS), which called for a battle force of 382 to 446 manned ships and between 143 and 242 unmanned vessels. The 2016 Force Structure Assessment's fleet of 355 battle force ships (unmanned vessels were not part of that analysis) fits within the 2022 plan's range, but under the 2022

plan, the Navy would have fewer combat ships and more logistics ships compared with the 2016 goals.[2]

Although the 2022 plan lacks details about the precise number of ships and unmanned systems the Navy would purchase and how quickly the inventory of the future fleet would evolve, the plan embraces themes from previous shipbuilding plans and force structure assessments. Specifically, the plan endorses the following:

- A larger and more diversified fleet;
- A reduction in the number of large and more capable ships;
- A larger number of smaller combatants;
- A substantially larger attack submarine force;
- The construction of more logistics ships of new types to support a larger fleet; and
- The development and fielding of large numbers of unmanned surface and undersea vessels.

Those themes were also emphasized in the Navy's December 2020 shipbuilding plan, the FNFS, and the Integrated Force Structure Assessment (which was never released to the public but was discussed by Navy officials in 2019 and early 2020).[3] The Navy's 2016 Force Structure Assessment also called for a larger fleet than today's fleet (and the fleet in 2017 when that assessment was published), but it included plans to increase the number of every type of battle force ship, including large and more capable ships.[4]

Aircraft Carriers

Under the 2022 plan, the future carrier force would range from 9 to 11 ships. However, it is not clear whether that range represents a reduction in the carrier force from today's force of 11 ships or the natural fluctuation caused by the retirement of old ships and the commissioning of new ones. Under the Navy's December 2020 shipbuilding plan, the carrier force also would have ranged from 9 to 11 ships between 2020 and 2049 (with the lower number occurring in the late 2040s). But that plan did not call for a smaller carrier force.

Submarines

The Navy's current fleet includes ballistic missile submarines (SSBNs), attack submarines (SSNs), and guided missile submarines. The 2022 plan's objective force would include 12 SSBNs, although they would eventually be Columbia class rather than today's Ohio class submarines, which is consistent with earlier shipbuilding plans. The Navy determined years ago that a future force of 12 Columbia class SSBNs would provide a capability equivalent to today's 14 Ohio class boats. (The Columbia class would not need to undergo a two-year midlife refueling of its reactor cores, and thus fewer SSBNs would be necessary to meet goals for the number of submarines available for operations.)

The 2022 plan would increase the number of SSNs by 12 to 18 ships, or 22 percent to 33 percent, to a goal of 66 to 72. Those numbers include a new class of large payload submarines (which would probably have a mission similar to that of today's guided missile submarines). Currently, attack submarines are constructed at a rate of 2 per year. However, the 2022 plan indicates that the Navy would like to increase the attack submarine force sooner than that rate would allow. "To meet the demand for additional submarines, industrial base capacity must be expanded," the plan notes. "The plan beyond the Future Years Defense Program (FYDP) reflects an increase in SSN production that is fully realized with the conclusion of the Columbia class procurement and delivery."[5] If the Navy continued to build attack submarines at a rate of 2 per year for the next 30 years, it could achieve a force of 66 SSNs in 2048 and could maintain that level thereafter.

2. See Department of the Navy, *Executive Summary, 2016 Navy Force Structure Assessment (FSA)* (December 2016), http://tinyurl.com/zgdk5o7 and, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels* (December 2020), pp. 9–10, https:// tinyurl.com/y7aox3gs (PDF, 1.05 MB). See also Congressional Budget Office, *An Analysis of the Navy's December 2020 Shipbuilding Plan* (April 2021), www.cbo.gov/publication/57091; and Ronald O'Rourke, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, Report for Congress RL32665, version 342 (Congressional Research Service, updated September 8, 2021), https://go.usa.gov/xFM2m.

3. See David B. Larter, "U.S. Navy's Long-Delayed Plan for Its Future Force Is Near the Finish Line…Sort of," *DefenseNews* (September 10, 2020), https://tinyurl.com/y4dazzh5.

4. See Department of the Navy, *Executive Summary, 2016 Navy Force Structure Assessment (FSA)* (December 2016), http://tinyurl.com/zgdk5o7.

5. See Department of the Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2022* (June 2021), p. 4, https://tinyurl.com/297p577v (PDF, 723 KB).

No recent force structure assessment has included a goal for large payload submarines. Under its previous three shipbuilding plans, however, the Navy would have started building those platforms in the 2040s, after completing the Columbia class SSBNs. (The Navy's existing guided missile submarines will be retired by 2028.) The Navy's 2022 plan differs from previous force structure assessments in that it includes large payload submarines in its fleet goals, but it counts them together with attack submarines. Presumably, the large payload submarine would be a modified version of a Columbia class submarine, just as existing guided missile submarines are converted Ohio class ballistic missile submarines.

Surface Combatants

In its 2022 plan, the Navy states that "the FNFS indicated that growing the small surface combatant force enables reductions in the quantity of large surface combatants while yielding a more distributed and lethal force."[6] Accordingly, under that plan, the number of large surface combatants would decrease, but the number of small surface combatants would increase. The shift in composition of the surface combatant force is one of the most important changes the 2022 plan would make. A key implication of that change—the capability to carry and launch missiles—is discussed later in this report.

Large Surface Combatants. The Navy's force of large surface combatants currently consists of 92 cruisers and destroyers. The 2022 plan would reduce that force by about one-third, to between 63 and 65 ships. In the absence of year-by-year details, CBO analyzed four illustrative scenarios regarding the Navy's future large surface combatant force: Three scenarios illustrate ways the Navy could implement the substantial reduction in the large surface combatant force outlined in the 2022 plan, and one illustrates the effect of maintaining the existing build rate of 2 destroyers per year.

In the short term, the Navy plans to retire 7 Ticonderoga class cruisers in 2022. If the Navy continued to retire the remaining cruisers and older destroyers at a rate of 5 to 7 per year, the size of the force would fall to around the plan's goal by 2030 (see Figure 1, Scenario 1). In that scenario, however, the Navy would lose capability by retiring so many large combatants so quickly and would not have had time to build up the small surface combatant force necessary to compensate for that loss. Conversely, if the Navy retired those 7 cruisers in 2022, kept the remaining ships for their expected service life of 35 to 40 years, and built destroyers at the current rate of 2 per year indefinitely, it would not reduce the size of the large surface combatant force to the mid-60s any time over the next 30 years (see Figure 1, Scenario 4). To achieve the objective force and maintain it, the Navy would have to retire more ships earlier than previously planned or substantially reduce the procurement of new ships in the coming decade (see Figure 1, Scenarios 2 and 3).

Small Surface Combatants. The Navy's current force of small surface combatants includes 31 littoral combat ships (LCSs) and mine countermeasures ships. Under the 2022 plan, the Navy would increase that force by 9 to 14 ships, or 29 to 45 percent, to a total of 40 to 45 ships.[7]

The composition of the future small surface combatant force remains unclear. Currently, the Navy has 23 LCSs and 8 mine countermeasures ships. Another 11 LCSs are under construction. The Navy retired 1 LCS recently and plans to retire one more in 2021 and another 4 in 2022. Under earlier shipbuilding plans, all 8 mine countermeasures ships would have been retired in the 2020s. The Navy also has 2 new Constellation class frigates under construction and plans to buy at least 18 more, including 1 in 2022.

But a force of 40 to 45 small surface combatants composed of LCSs and frigates would not replace the capability of the nearly 30 large surface combatants that the Navy would shed under the 2022 plan.[8] If the Navy were instead to build 40 to 45 frigates to constitute its future small surface combatant force, then many LCSs could be retired well short of their expected service life of 25 years to keep the small surface combatant fleet within the limits of the Navy's new goal.

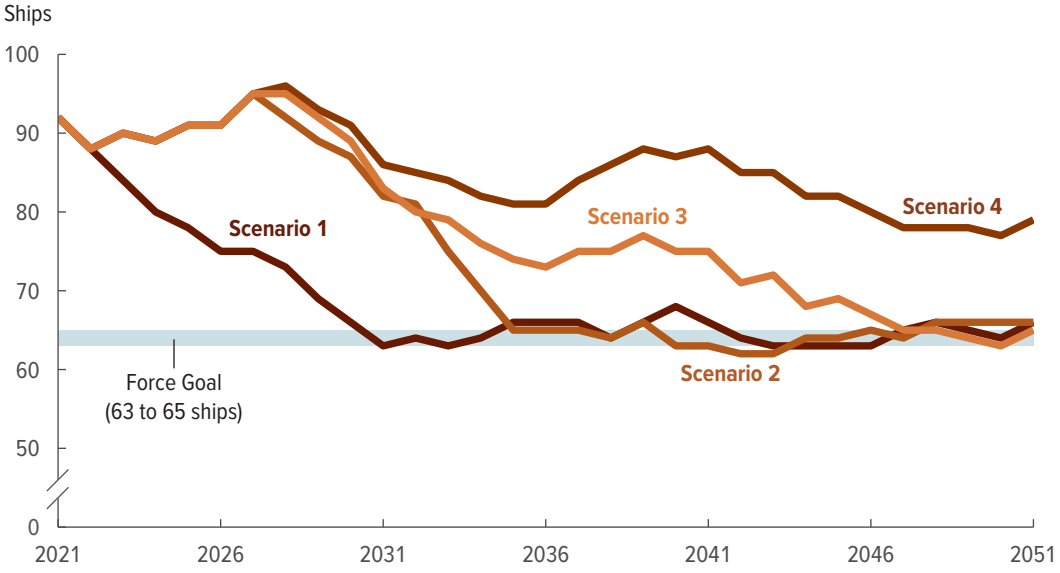
6. See Department of the Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2022* (June 2021), p. 4, https://tinyurl.com/297p577v (PDF, 723 KB).

7. For a description of what the major types of ship in the Navy's fleet do, see Congressional Budget Office, *An Analysis of the Navy's December 2020 Shipbuilding Plan* (April 2021), Appendix A, www.cbo.gov/publication/57091.

8. The Navy also plans to install a small number of shorter-range antiship missiles on each LCS. However, those missiles are much less capable than those that can be launched from the larger warships.

Figure 1.

Size of the Large Surface Combatant Force Under Four Scenarios



The Navy could reduce its large surface combatant force by shortening the service life of existing destroyers, by decreasing the rate at which it procures new destroyers, or by combining both methods.

Data source: Congressional Budget Office. See www.cbo.gov/publication/57414#data.

Under Scenario 1, the Navy would retire ships quickly to meet force goals by 2030 and would maintain the size of the force with a steady-state build rate of 1.8 destroyers per year.

Under Scenario 2, the Navy would maintain a steady-state build rate of 2 destroyers per year and would reduce the size of the force with retirements by 2035.

Under Scenario 3, the Navy would maintain the 35- to 40-year service life for destroyers and buy 1 new destroyer per year through 2036 and 2 new destroyers per year thereafter.

Under Scenario 4, the Navy would maintain the 35- to 40-year service life for destroyers and buy 2 new destroyers per year (the current rate of purchase).

Amphibious Warfare Ships

Like the surface combatant force, the amphibious warfare force would experience a change in composition under the 2022 plan. In particular, the number of small amphibious warfare ships would increase from zero today to between 24 and 35. The Navy would have fewer large amphibious ships: The number of amphibious transport docks and dock landing ships would decline from 22 ships today to between 16 and 19 ships, a reduction of 14 percent to 27 percent.

The small amphibious warfare ship is a new program designed to support the Marine Corps' 10-year modernization effort known as Force Design 2030.[9] The Marines want to deploy small units equipped with antiship missiles and with other potential weapons and capabilities on numerous islands in the Pacific Ocean to disrupt and counter any military aggression by Chinese ships and aircraft. Large amphibious ships are perceived as being vulnerable to Chinese military forces and are not well suited to deploy and support large numbers of small, highly dispersed Marine Corps teams. As a result, the Navy's future amphibious force would include fewer large amphibious ships and more small amphibious warfare ships.

Combat Logistics and Support Ships

Currently, the Navy has 29 combat logistics ships and 34 support ships. Under the 2022 plan, the number of combat logistics ships would increase to between 56 and 75 ships (a 93 percent to 159 percent increase), whereas the number of support ships would decrease to between 27 and 29. Although the 2022 plan does not provide details about the types of combat logistics ships that the Navy would buy, much of the increase would probably come from the purchase of new, smaller logistics ships designed to support a larger, more dispersed fleet.

Unmanned Surface and Undersea Vessels

Perhaps the most significant change in the Navy's shipbuilding plan compared with today's fleet is the use

9. See United States Marine Corps, *Force Design 2030: Annual Update* (April 2021), https://tinyurl.com/2nuzmwvv (PDF, 239 KB).

of unmanned vessels. Under the 2022 plan, the Navy envisions a force of between 77 and 140 unmanned vessels—18 to 51 unmanned undersea vessels and 59 to 89 unmanned surface vessels. The Navy has indicated that different types of unmanned systems could bring new and innovative capabilities to the fleet, and the 2022 plan calls for two or three different types, although the numbers of each type have not been specified. Current development programs for surface vessels include a medium-sized vessel to serve as a sensor and communications platform and a large vessel that would carry missiles and perhaps sensors. The Navy is also exploring the possibility of using an unmanned system as a logistics support ship. Additionally, the Navy is testing a variety of unmanned undersea vessels of different sizes for use in the future fleet.

The Cost of the Navy's 2022 Plan Would Exceed Recent Shipbuilding Budgets

CBO estimates that the force envisioned in the 2022 plan would cost an average of between $25.3 billion and $32.7 billion per year in 2021 dollars (see Table 2). That funding would cover new-ship construction, the refueling of aircraft carriers, and other items, such as outfitting and post-delivery costs for new ships and ships returning from major maintenance periods. Those amounts are 10 percent to 43 percent higher than the $22.9 billion the Congress has appropriated, on average, for all shipbuilding activities over the past five years.

Costs for new-ship construction alone, including unmanned vessels, would average between $23.4 billion and $30.6 billion per year. Those amounts are 15 percent to 50 percent greater than the $20.2 billion that the Congress appropriated for new-ship construction, on average, over the past five years.[10] Manned battle force ships account for 94 percent to 97 percent of those potential costs, but represent only 73 percent to 81 percent of the number of platforms in the Navy's objective force.

Because the Navy's plan does not include a specific procurement schedule, those projections are a steady-state estimate of the cost of building the platforms anticipated in the 2022 plan. CBO calculated the average annual procurement cost of all the ships in the Navy's objective force by dividing the number of ships in each class by their expected service life (which determines the number of ships that the Navy would have to buy each year, on average, to sustain a fleet of that given size) and then multiplying that result by the average unit cost of buying those ships.

For cases in which the service life of a ship class is potentially a range, as is the case with destroyers, or there is more than one possible cost of the replacement, the average annual cost is also expressed as part of that range. Because the size of the objective force is expressed as a range in the 2022 plan, CBO calculated a steady-state estimate for both ends of that range, with the lower end reflecting a fleet with 398 platforms and the upper end reflecting one with 512 platforms. The unit costs for the ships used in this analysis were based on the estimated unit costs published in CBO's analysis of the December 2020 shipbuilding plan.[11]

For example, if 50 destroyers each had a service life of 35 to 40 years, the Navy would need to purchase between 1.25 and 1.42 destroyers per year to maintain a force of 50. If each destroyer cost between $1.8 billion (the cost of destroyers being built today) and $2.8 billion (the estimated cost of the next generation of destroyers), the average annual cost of maintaining a force of 50 destroyers in steady state would be between $2.3 billion (that is, $1.8 billion multiplied by 1.25) and $4.0 billion (that is, $2.8 billion multiplied by 1.42) per year.

CBO's approach provides a measure of the funding required to keep a fleet of a certain size over the long term, but it does not provide any insight into the phasing of the ship purchases that the Navy would have to make to reach its objective force in the first place. The Navy would have to provide the detailed procurement, delivery, and retirement schedules that have accompanied its previous shipbuilding plans for CBO to do a phased analysis.

The Navy's 2022 Plan Would Have Implications for Its Surface Missile Force

The force structure goals expressed in the Navy's 2022 plan have a significant implication for how the distribution of vertical launch system cells on the Navy's surface

10. See Congressional Budget Office, *An Analysis of the Navy's December 2020 Shipbuilding Plan* (April 2021), www.cbo.gov/publication/57091.

11. See Congressional Budget Office, *An Analysis of the Navy's December 2020 Shipbuilding Plan* (April 2021), Appendix Table B-1, www.cbo.gov/publication/57091.

Table 2.

Average Potential Ship Construction Costs Under the Navy's 2022 Shipbuilding Plan

	Naval Platform Ranges (Number of ships)		Service Life (Years)		Average Annual Cost (Billions of 2021 dollars)	
	Low	High	Low	High	Low	High
Aircraft Carriers	9	11	50	50	2.3	2.9
Submarines						
Ballistic missile	12	12	42	42	2.3	2.3
Attack, guided missile, and large payload[a]	66	72	33	42	9.3	10.7
Large Surface Combatants	63	65	35	40	4.4	6.1
Small Surface Combatants and Mine Countermeasures Ships[b]	40	45	20	30	1.5	2.6
Amphibious Warfare Ships						
LHDs and LHAs	8	9	40	40	0.7	0.9
LPDs and LSDs	16	19	40	40	0.7	0.9
Small amphibious warfare ships	24	35	20	30	0.1	0.3
Subtotal, combat ships	238	268	n.a.	n.a.	21.3	26.7
Combat Logistics Ships	56	75	30	45	1.0	1.7
Support Ships	27	29	30	45	0.4	0.5
Subtotal, combat logistics and support ships	83	104	n.a.	n.a.	1.4	2.2
Total Manned Battle Force Ships	**321**	**372**	**n.a.**	**n.a.**	**22.7**	**28.9**
Unmanned Surface Vessels	59	89	10	15	0.5	1.3
Unmanned Undersea Vessels	18	51	10	15	0.1	0.4
Total Unmanned Vessels	**77**	**140**	**n.a.**	**n.a.**	**0.6**	**1.7**
Total Manned Battle Force Ships and Unmanned Vessels	**398**	**512**	**n.a.**	**n.a.**	**23.4**	**30.6**
Aircraft Carrier Refueling and Outfitting Costs	n.a.	n.a.	n.a.	n.a.	1.9	2.1
Total Shipbuilding Costs	**n.a.**	**n.a.**	**n.a.**	**n.a.**	**25.3**	**32.7**

Data source: Congressional Budget Office. See www.cbo.gov/publication/57414#data.

LHA and LHD = amphibious assault ship; LPD = amphibious transport dock; LSD = dock landing ship; n.a. = not applicable.

a. The 2022 shipbuilding plan counts together attack submarines and the future large payload submarines that under previous shipbuilding plans the Navy would begin building in the 2040s. They would probably have a mission similar to that of the guided missile submarines in today's fleet, which are converted ballistic missile submarines. Attack submarines have a service life of 33 years, and CBO assumed that large payload submarines would have a service life of 42 years, the same as the guided missile submarines in today's fleet.

b. The 2022 shipbuilding plan counts the current force of small surface combatants and dedicated mine countermeasures ships together. The Navy does not plan to replace the mine countermeasures ships.

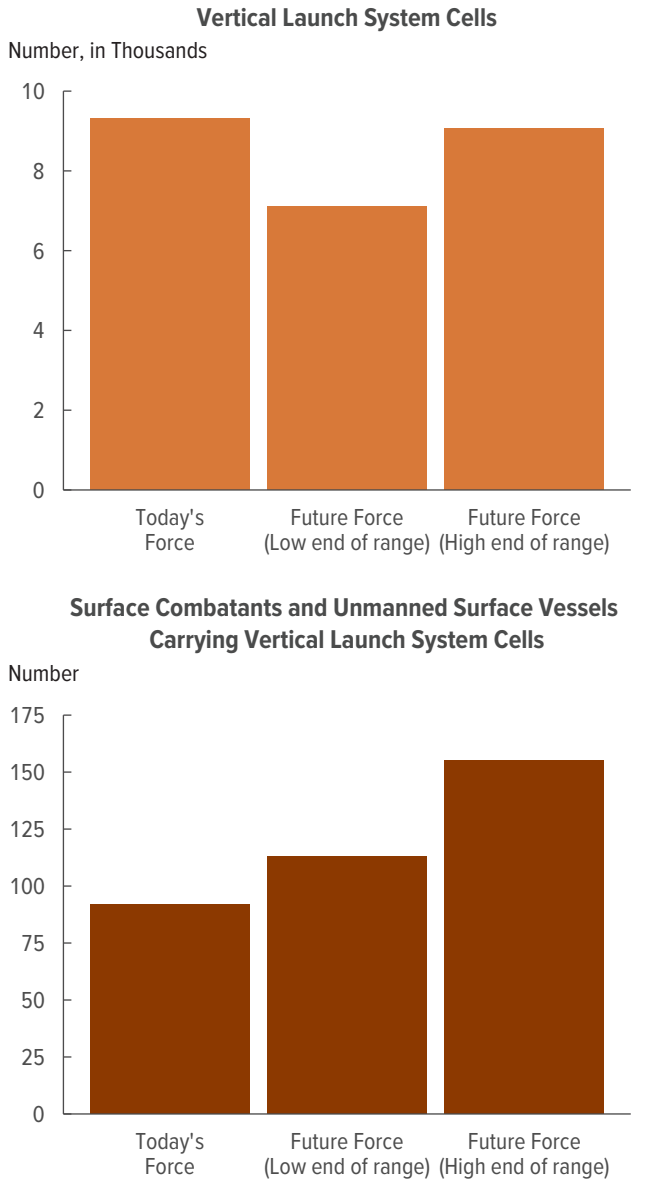
ships could evolve.[12] The VLS is a highly versatile system capable of launching a variety of defensive and offensive missiles and is the Navy's primary weapons battery on large surface ships. The system is composed of numerous missile tubes—or cells—and the computers and electronics necessary to launch the missiles. Each cell can hold one or more missiles, and different types of missiles can be loaded into each cell such that each ship could carry a variety of different weapons.

The fleet's total VLS cell capacity represents one of the most important measures of the Navy's offensive and

12. In this report, CBO assumed future surface combatants would continue to carry VLS cells. However, the Navy could develop or use a different missile launching system. A future system might carry more missiles in the same amount of space as the existing VLS or a new system might carry fewer missiles, but those missiles would be larger and more capable.

Figure 2.

Vertical Launch System Capability of the Surface Force Under the Navy's 2022 Shipbuilding Plan



Under the Navy's 2022 plan, the surface forces (manned and unmanned) would eventually have between 3 percent and 24 percent fewer vertical launch sytem cells than today's fleet, but the cells would be deployed on 23 percent to 68 percent more ships.

Data source: Congressional Budget Office. See www.cbo.gov/publication/57414#data.

The 2022 plan provided a range for the number of ships in the Navy's objective fleet.

The numbers in this figure do not include vertical launch system cells on submarines.

defensive firepower. In the Navy's objective force, the overall firepower (measured by the number of VLS cells) of the surface combatants would be less than it is today, but that force would pose a much harder targeting problem for an opposing fleet because the VLS cells would be deployed on many more ships.

Most cruisers and destroyers in today's fleet carry between 90 and 122 VLS cells.[13] Although the LCS does not carry the VLS, the new Constellation class frigate will carry 32 cells, and the Navy wants the large unmanned surface vessel (LUSV) to carry 16 or 32 cells (the exact number is still to be determined).[14]

Under the 2022 plan, the Navy would reduce the number of large surface combatants and increase the number of small surface combatants and, presumably, the number of unmanned surface vessels carrying missiles. The composition of the small surface combatant force is not clearly defined, however. Based on existing programs (the LCS and the Constellation class frigate), the future small surface combatant force could, on the low end, be composed of 40 ships—20 frigates and 20 LCSs. On the high end, it could be composed of 45 frigates, unless the Navy develops another class of small surface combatant. If the Navy succeeded in getting Congressional approval to equip the LUSV with VLS cells (it is currently prohibited from doing so) and half of the unmanned surface vessels in the 2022 plan were LUSVs, the objective force would have 30 to 45 LUSVs. (The Navy has not yet determined the mix of large and medium unmanned surface vessels in the objective force.)

As a result of those changes (and CBO's assumptions about how those changes would be implemented), more surface combatants and unmanned systems would carry VLS cells, but the total number of VLS cells would be smaller (see Figure 2). Specifically, today's surface

13. The single DDG-1000 Zumwalt class destroyer in the fleet today carries 80 peripheral vertical launch system cells that are individually somewhat larger than the standard VLS on the Navy's other cruisers and destroyers. Eventually the Navy will have 3 Zumwalt class destroyers. By 2026, the Navy also plans to remove the two gun mounts on the 3 Zumwalts and replace them with two weapons modules that will each carry three conventional prompt strike missiles. Those missiles are much larger than those that fit within VLS cells. They are expected to have an extremely long range and are intended for important and high-value targets.

14. The LCSs are being retrofitted to carry eight shorter-ranged antiship naval strike missiles, but they will not use the VLS.

combatant force carries about 9,300 VLS cells on 92 ships. (The 7 cruisers the Navy wants to retire this year carry 122 cells each, for a total of 854 cells.) If the Navy built the future objective force to the low end of the ranges in the 2022 plan and put only 16 VLS cells on the LUSVs, the surface force would carry about 7,100 VLS cells on 113 ships and unmanned vessels (about 24 percent fewer missiles in a fleet with 23 percent more platforms than today's fleet). If, instead, the Navy built to the high end of the ranges in the 2022 plan and put 32 VLS cells on the LUSVs, the force would carry about 9,100 missiles on 155 ships and unmanned vessels (about 3 percent fewer missiles in a fleet with 68 percent more ships than today's fleet). Thus, the overall firepower of the force would be less than it is today, but many more ships would carry that firepower.

The number of attack submarines in the objective force outlined in the 2022 plan would also affect the number of missiles in the Navy's overall objective force: Under the 2022 plan, the size of the Navy's attack submarine force would increase, and the Navy would build large payload submarines to eventually replace its guided missile submarines. Because some future versions of the attack submarines could be capable of carrying up to 40 missiles (more than the new frigate will carry), the number of missiles carried by the overall objective force could still be as great or greater than today's fleet. However, that would depend on the timing of future submarine purchases and the design of both the next-generation attack submarine and the large payload submarine.

This report by the Congressional Budget Office was prepared as required by the 2012 National Defense Authorization Act. In accordance with CBO's mandate to provide objective, impartial analysis, the report makes no recommendations.

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

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