Congressional CBO Budget Office
Summary

An Analysis of the Navy's Fiscal Year 2011 Shipbuilding Plan

At the direction of the Congress, the Department of the Navy issues annual reports that describe its plans for ship construction over the coming 30 years. The latest report—issued in February and covering fiscal years 2011 to 2040—contains some significant changes in the Navy's long-term goals for shipbuilding.[1] The new plan appears to increase the required size of the fleet compared with earlier plans, while reducing the number of ships to be purchased—and thus the costs for ship construction—over the next three decades. Despite those reductions, the total costs of carrying out the 2011 plan would be much higher than the funding levels that the Navy has received in recent years, according to analysis by the Congressional Budget Office (CBO). Specifically:

- Language in the 2011 shipbuilding plan and in related briefings by the Navy implies that the service's requirement for battle force ships (aircraft carriers, submarines, surface combatants, amphibious ships, and some logistics and support ships) now totals 322 or 323—up from 313 in the Navy's three previous long-term plans.[2] The battle force fleet currently numbers 286 ships. (Summary Box 1 describes the major ships in the Navy's fleet.)

- The 2011 plan calls for buying a total of 276 ships over the 2011–2040 period: 198 combat ships and 78 logistics and support ships (see Summary Table 1). That construction plan is insufficient to achieve a 322- or 323-ship fleet.

- In comparison, the previous shipbuilding plan (for 2009) envisioned buying 40 more combat ships and 20 fewer support ships over 30 years.[3] Under that plan, the Navy would have purchased 238 combat ships and 58 logistics and support ships between 2009 and 2038, for a total of 296.[4]

- If the Navy receives the same amount of funding for ship construction in the next 30 years as it has over the past three decades—an average of about $15 billion a year in 2010 dollars—it will not be able to afford all of the purchases in the 2011 plan.[5]

1. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2011* (February 2010), www.militarytimes.com/static/projects/pages/2011shipbuilding.pdf.

2. The alternative totals result from the Navy's current requirement—10 or 11 ships—for aircraft carriers. The timing of its purchases to fulfill that requirement would enable the Navy to have a force of at least 11 carriers most of the time through 2040, except in 2013 and 2014, when the number would drop to 10.

3. The Navy did not release a long-term shipbuilding plan for fiscal year 2010.

4. Of the nine Maritime Prepositioning Force (Future), or MPF(F), ships included in the 2009 plan, CBO categorized two of them (aviation ships) as combat ships and the rest as logistics and support ships. In the 2011 plan, purchases of multiple landing platform ships are included in the category of support ships, whereas in the 2009 plan, a much larger and more expensive version of the multiple landing platform ship was included in the MPF(F) category.

5. For a broader discussion of historical cost trends in Navy shipbuilding, see the statement of Eric J. Labs, Senior Analyst for Naval Forces and Weapons, Congressional Budget Office, before the Subcommittee on Seapower and Expeditionary Forces, House Committee on Armed Services, *The Long-Term Outlook for the U.S. Navy's Fleet* (January 20, 2010).

Summary Table 1.

Comparison of the Navy's Long-Term Shipbuilding Plans for Fiscal Years 2009 and 2011

	2009 Plan (2009–2038)	2011 Plan (2011–2040)
	Number of Ships Purchased Over 30 Years	
Aircraft Carriers	7	6
Ballistic Missile Submarines	12	12
Attack Submarines	53	44
Large Surface Combatants	69	50
Littoral Combat Ships	75	66
Amphibious Ships	20	20
MPF(F) Ships	9	n.a.
Combat Logistics and Support Ships	51	78
Total	**296**	**276**
	Costs (Billions of 2010 dollars)	
Total Cost of New-Ship Construction over 30 Years[a]		
Navy's estimate	718 [b]	476
CBO's estimate	775 [b]	569
Average Annual Cost of New-Ship Construction[a]		
Navy's estimate	23.9	15.9
CBO's estimate	25.8	19.0
Average Price per Ship		
Navy's estimate	2.4	1.7
CBO's estimate	2.6	2.1

Sources: Congressional Budget Office; Department of the Navy.

Note: MPF(F) = Maritime Prepositioning Force (Future); n.a. = not applicable.

a. New-ship construction costs exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and postdelivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).

b. These estimates include CBO's 2009 projections of the costs of ballistic missile submarines. The Navy's estimate also reflects corrected data that the service released after publishing the 2009 shipbuilding plan.

- The Navy estimates that buying the new ships in the 2011 plan will cost an average of about $16 billion per year, or a total of $476 billion over 30 years (about 33 percent less than its estimate for the 2009 plan).[6] Those figures are solely for construction of new ships, the only type of costs reported in the Navy's shipbuilding plans. However, other activities that are typically funded from the Navy's budget accounts for ship construction—such as refueling nuclear-powered aircraft carriers and outfitting new ships with various small pieces of equipment after the ships have been built or delivered—will add about $2 billion to the Navy's average annual shipbuilding costs under the 2011 plan, in CBO's estimation.

- Using its own models and assumptions, CBO estimates that the cost for new-ship construction under the 2011 plan will average about $19 billion per year, or a total of $569 billion through 2040.[7] Including the expense of refueling aircraft carriers as well as outfitting and postdelivery costs raises that average to about $21 billion per year, CBO estimates. (Those figures are about 25 percent lower than CBO's estimates of the Navy's 2009 plan.)

- CBO's estimates of the costs of the 2011 shipbuilding plan are about 18 percent higher than the Navy's estimates overall. That figure masks considerable variation over time, however: CBO's estimates are 4 percent higher than the Navy's for the first 10 years of the plan, 13 percent higher for the following decade, and 37 percent higher for the final 10 years of the plan (see Summary Figure 1). Those differences result partly from different estimating methods and different assumptions about the design and capabilities of future ships. The estimates also diverge because CBO accounted for the fact that costs of labor and materials have traditionally grown much faster in the shipbuilding industry than in the economy as a whole, whereas the Navy does not appear to have done so. That difference becomes more pronounced over time.

6. CBO calculated that 33 percent figure by adding its 2009 estimate of the cost of new ballistic missile submarines to the Navy's 2009 estimate of new-ship construction. If the cost of those submarines was not included in the calculation, the Navy's estimate for ship construction under its 2011 plan would be 25 percent lower than the cost of new ships under the 2009 plan.

7. Generally, CBO estimates the price of future naval vessels on the basis of the relationship between cost and weight of analogous ships. The estimated cost per ship is then adjusted for factors such as the number of ships of the same type being built at a given shipyard, production efficiencies that occur as more ships of the same class are produced, and the fact that prices of labor and materials in the naval shipbuilding industry tend to rise faster than prices in the economy as a whole.

Summary Box 1.

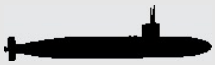
The Roles of Major Types of Ships in the Navy's Fleet

Nimitz Class
Aircraft Carrier

The Navy's 11 **aircraft carriers** are the heart of the battle force fleet. Each carries an air wing of about 60 aircraft, which can attack hundreds of targets per day for up to a month before needing to be rested. Carriers are by far the largest ships in the fleet, with a weight (displacement) of about 100,000 tons. Ten of the 11 current carriers belong to the Nimitz class.

Ohio Class Ballistic
Missile Submarine

Strategic **ballistic missile submarines** carry the major part of the U.S. nuclear deterrent, up to 24 Trident missiles with four to eight nuclear warheads apiece. The Navy has 14 Ohio class ballistic missile submarines in the strategic role and has converted four more to a conventional guided missile (SSGN) configuration, each of which displaces about 19,000 tons submerged. Those SSGNs carry up to 154 Tomahawk missiles as well as special-operations forces.



Los Angeles Class
Attack Submarine

Attack submarines are the Navy's premier undersea warfare and antisubmarine weapon. Since the end of the Cold War, however, they have mainly performed covert intelligence-gathering missions. They have also been used to launch Tomahawk missiles at inland targets in the early stages of conflicts. The Navy has 53 attack submarines, 44 of which belong to the Los Angeles class. At 7,000 tons, they are less than half the size of ballistic missile submarines.

Arleigh Burke Class
Destroyer

Large surface combatants—which include cruisers and destroyers—are the workhorses of the fleet. They defend the Navy's aircraft carriers and amphibious ships against other surface ships, aircraft, and submarines. They also perform many day-to-day missions, such as patrolling sea lanes, providing overseas presence, and conducting exercises with allies. In addition, they are capable of striking land targets with Tomahawk missiles. Different types of surface combatants have displacements ranging from 9,000 to 14,000 tons.

Freedom Class
Littoral Combat Ship

Small surface combatants are composed of frigates and, in the future, littoral combat ships. Frigates today are used to perform many of the same day-to-day missions as large surface combatants. Littoral combat ships are intended to counter mines, small boats, and diesel electric submarines in the world's coastal regions. More routinely, they will also participate in patrolling sea lanes, providing overseas presence, and conducting exercises with allies. These ships range in size from 3,000 to 4,000 tons.

Wasp Class Amphibious
Assault Ship

The Navy's two classes of **amphibious assault ships** (also known as helicopter carriers) are the second largest ships in the fleet at 40,000 tons. They form the centerpiece of amphibious ready groups and can each carry about half the troops and equipment of a Marine expeditionary unit. They also carry as many as 30 helicopters and six fixed-wing Harrier jump jets, or up to 20 Harriers.

Austin Class Amphibious
Transport Dock

The Navy has four other classes of amphibious warfare ships, and such ships are divided into two types: **amphibious transport docks** and **dock landing ships.** Two of those ships together provide the remaining transport capacity for a Marine expeditionary unit in an amphibious ready group. They range in size from 16,000 to 25,000 tons.

Supply Class Fast Combat
Support Ship

The many **logistics and support ships** in the Navy's fleet provide the means to resupply, repair, salvage, or tow combat ships. The most prominent of those vessels are fast combat support ships, which operate with carrier strike groups to resupply them with fuel, dry cargo (such as food), and ammunition. These ships can be as small as 2,000 tons for an ocean-going tug or as large as 50,000 tons for a fully loaded fast combat support ship.

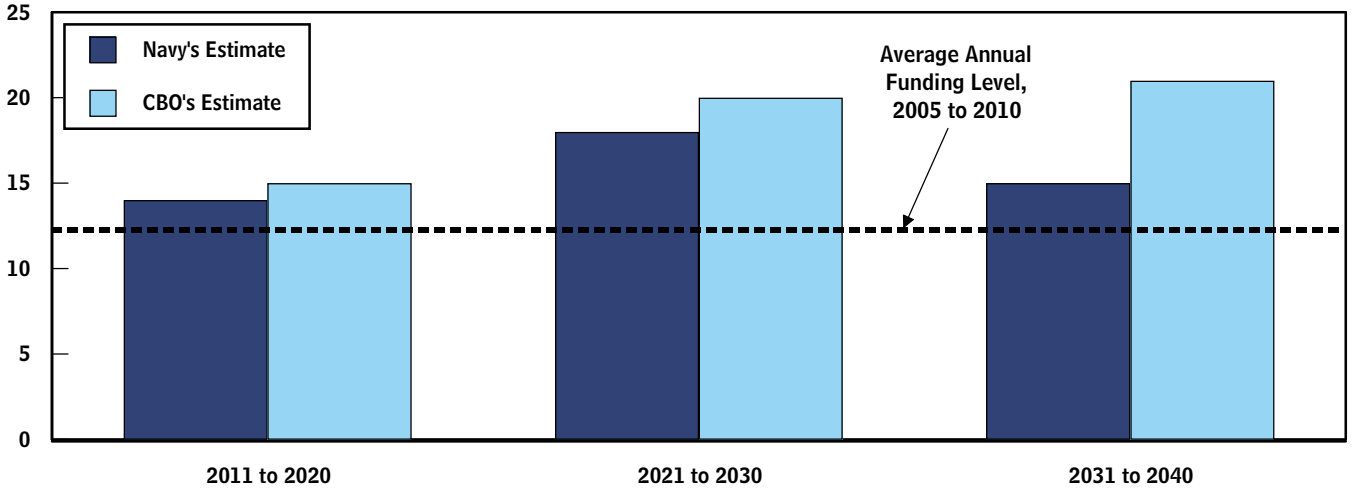
Source: Congressional Budget Office.

Note: Ship silhouettes are not to scale.

Summary Figure 1.

Average Annual Cost of New-Ship Construction Under the Navy's 2011 Plan

(Billions of 2010 dollars)



Sources: Congressional Budget Office; Department of the Navy.

Note: New-ship construction costs exclude the costs of refueling existing nuclear-powered aircraft carriers as well as outfitting and post-delivery costs (which include the purchase of many smaller tools and pieces of equipment needed to operate a ship but not necessarily provided by the manufacturing shipyard as part of ship construction).