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Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress

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SUMMARY

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Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress

The Navy's Light Amphibious Warship (LAW) program envisions procuring a class of up to 35 new amphibious ships to support the Marine Corps, particularly in implementing a new Marine Corps operational concept called Expeditionary Advanced Base Operations (EABO). The Navy had previously envisioned procuring the first LAW in FY2023, but the Navy's FY2023 budget submission defers the procurement of the first LAW to FY2025. The Navy's proposed FY2023 budget requests $12.2 million in research and development funding for the program.

The EABO concept was developed with an eye toward potential conflict scenarios with China in the Western Pacific. Under the concept, the Marine Corps envisions, among other things, having reinforced-platoon-sized Marine Corps units maneuver around the theater, moving from island to island, to fire anti-ship cruise missiles (ASCMs) and perform other missions so as to contribute, alongside Navy and other U.S. military forces, to U.S. operations to counter and deny sea control to Chinese forces. The LAW ships would be instrumental to these operations, with LAWs embarking, transporting, landing, and subsequently reembarking these small Marine Corps units.

LAWs would be much smaller and individually much less expensive to procure and operate than the Navy's current amphibious ships. Under the Navy's FY2023 budget submission, the first LAW would be procured in FY2025 at a cost of $247.0 million, the second LAW would be procured in FY2026 at a cost of $203.0 million, and the third and fourth LAWs would be procured in FY2027 at a combined cost of $290.0 million (i.e., an average cost of $145.0 million each). The first LAW would cost substantially more than subsequent ships in the program because the procurement cost of the first LAW would include much or all of the detailed design/nonrecurring engineering (DD/NRE) costs for the class. (It is a traditional Navy budgeting practice to include much of all of the DD/NRE costs for a class of ship in the procurement cost of the lead ship in the class.)

The LAW as outlined by the Navy could be built by any of several U.S. shipyards. The Navy's baseline preference is to have a single shipyard build all the ships, but the Navy is open to having them built in multiple yards to the same design if doing so could permit the program to be implemented more quickly and/or less expensively. The Navy's FY2023 budget submission states that the contract for the construction of the first LAW would be awarded in December 2024, and that the ship would be delivered in July 2028.

The LAW program poses a number of potential oversight matters for Congress. The issue for Congress is whether to approve, reject, or modify the Navy's annual funding requests and envisioned acquisition strategy for the program. Congress's decisions regarding the program could affect Navy and Marine Corps capabilities and funding requirements and the U.S. shipbuilding industrial base.

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Introduction

This report provides background information and issues for Congress on the Navy's new Light Amphibious Warship (LAW) program, which envisions procuring a class of up to 35 new amphibious ships to support the Marine Corps, particularly in implementing a new Marine Corps operational concept called Expeditionary Advanced Base Operations (EABO). The Navy had previously envisioned procuring the first LAW in FY2023, but the Navy's FY2023 budget submission defers the procurement of the first LAW to FY2025. The Navy's proposed FY2023 budget requests $12.2 million in research and development funding for the program.

The LAW program poses a number of potential oversight matters for Congress. The issue for Congress is whether to approve, reject, or modify the Navy's annual funding requests and envisioned acquisition strategy for the program. Congress's decisions regarding the program could affect Navy and Marine Corps capabilities and funding requirements and the U.S. shipbuilding industrial base.

A separate CRS report discusses the Navy's programs for building much-larger LPD-17 Flight II and LHA-class amphibious ships.[1] Other CRS reports provide an overview of Navy force structure and shipbuilding plans and the Marine Corps' plans for redesigning Marine Corps units and their equipment.[2]

Background

U.S. Navy Amphibious Ships

Roles and Missions

Navy amphibious ships are operated by the Navy, with crews consisting of Navy personnel. They are battle force ships, meaning ships that count toward the quoted size of the Navy. The primary function of Navy amphibious ships is to lift (i.e., transport) embarked U.S. Marines and their weapons, equipment, and supplies to distant operating areas, and enable Marines to conduct expeditionary operations ashore in those areas. Although amphibious ships can be used to support Marine landings against opposing military forces, they are also used for operations in permissive or benign situations where there are no opposing forces. Due to their large storage spaces and their ability to use helicopters and landing craft to transfer people, equipment, and supplies from ship to shore without need for port facilities,[3] amphibious ships are potentially useful for a range of combat and noncombat operations.[4]

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

[2] CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke; and CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiative: Force Design 2030*, by Andrew Feickert.

[3] Amphibious ships have berthing spaces for Marines; storage space for their wheeled vehicles, their other combat equipment, and their supplies; flight decks and hangar decks for their helicopters and vertical take-off and landing (VTOL) fixed-wing aircraft; and in many cases well decks for storing and launching their landing craft. (A well deck is a large, garage-like space in the stern of the ship. It can be flooded with water so that landing craft can leave or return to the ship. Access to the well deck is protected by a large stern gate that is somewhat like a garage door.)

[4] Amphibious ships and their embarked Marine forces can be used for launching and conducting humanitarian-

On any given day, some of the Navy's amphibious ships, like some of the Navy's other ships, are forward-deployed to various overseas operating areas in multiship formations called amphibious groups (ARGs). Amphibious ships are also sometimes forward-deployed on an individual basis, particularly for conducting peacetime engagement activities with foreign countries or for responding to smaller-scale or noncombat contingencies.

Current Types of Amphibious Ships

The Navy's current amphibious-ship force consists entirely of large amphibious ships, including the so-called "big-deck" amphibious assault ships, designated LHA and LHD, which look like medium-sized aircraft carriers, and the smaller (but still quite sizeable) amphibious ships, designated LPD or LSD, which are sometimes called "small-deck" amphibious ships.[5] As mentioned earlier, a separate CRS report discusses the Navy's current programs for procuring new LHA- and LPD-type ships.[6] The LAWs discussed in this CRS report would be much smaller than the Navy's current amphibious ships.

Amphibious Ship Force at End of FY2021

The Navy's force of amphibious ships at the end of FY2021 included 31 ships, including 9 amphibious assault ships (2 LHAs and 7 LHDs), 11 LPD-17 Flight I ships, and 11 older LSD-41/49 class ships. The LSD-41/49 class ships are to be replaced by new LPD-17 Flight II class ships.

Amphibious Ship Force-Level Goal Under 355-Plan of 2016

The Navy's current force-level goal, released in December 2016, calls for achieving and maintaining a 355-ship fleet that includes 38 amphibious ships—12 LHA/LHD-type ships, 13 LPD-17 Flight I class ships, and 13 LPD-17 Flight II class ships (12+13+13).[7] This 38-ship force-level goal predates the EABO concept and the initiation of the LAW program and consequently includes no LAWs.

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assistance and disaster-response (HA/DR) operations; peacetime engagement and partnership-building activities, such as exercises; other nation-building operations, such as reconstruction operations; operations to train, advise, and assist foreign military forces; peace-enforcement operations; noncombatant evacuation operations (NEOs); maritime-security operations, such as anti-piracy operations; smaller-scale strike and counter-terrorism operations; and larger-scale ground combat operations. Amphibious ships and their embarked Marine forces can also be used for maintaining forward-deployed naval presence for purposes of deterrence, reassurance, and maintaining regional stability.

[5] U.S. Navy amphibious ships have designations starting with the letter L, as in amphibious *landing*. LHA can be translated as landing ship, helicopter-capable, assault; LHD can be translated as landing ship, helicopter-capable, well deck; LPD can be translated as landing ship, helicopter platform, well deck; and LSD can be translated as landing ship, well deck. Whether noted in the designation or not, almost all these ships have well decks. The exceptions are LHAs 6 and 7, which do not have well decks and instead have expanded aviation support capabilities. For an explanation of well decks, see footnote 3. The terms "large-deck" and "small-deck" refer to the size of the ship's flight deck.

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

[7] For more on the Navy's 355-ship force-level goal, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke. For a more detailed review of the 38-ship force structure requirements, see Appendix A of archived CRS Report RL34476, *Navy LPD-17 Amphibious Ship Procurement: Background, Issues, and Options for Congress*, by Ronald O'Rourke.

Emerging New Amphibious Ship Force-Level Goal

The Navy and DOD since 2019 have been working to develop a new force-level goal to replace the Navy's current 355-ship force-level goal. The Navy's FY2023 30-year (FY2023-FY2052) shipbuilding plan, released on April 20, 2022, includes a table summarizing the results of studies that have been conducted on the successor force-level goal. These studies outline potential future fleets with 6 to 10 LHAs/LHDs and 30 to 54 other amphibious ships, including but not necessarily limited to LPDs and LAWs.[8]

Marine Corps officials state that, from their perspective, a minimum of 66 amphibious ships will be required in coming years, including a minimum of 31 larger amphibious ships (10 LHAs/LHDs and 21 LPDs) plus 35 LAWs (aka "31+35").[9]

At an April 26, 2022, hearing on Department of the Navy (DON) investment programs before the Seapower subcommittee of the Senate Armed Services Committee, the Department of the Navy testified that

> In order to ensure the future naval expeditionary force is maximized for effective combat power, while reflecting and supporting the force structure changes addressed in USMC's Force Design, the Secretary of the Navy directed an amphibious requirement study that will inform refinement of amphibious ship procurement plans and shipbuilding profiles, as well as inform the ongoing overall Naval Force Structure Assessment.[10]

In January 2022, Navy officials reportedly anticipated that the above-mentioned study would be completed by the end of March 2022.[11] At the end of March 2022, the study reportedly was expected to be completed shortly.[12] At the beginning of April 2022, the study reportedly was in its final stages.[13]

The Navy's FY2023 30-year (FY2023-FY2052) shipbuilding plan, released on April 20 2022, states that "the Navy will begin assessment of a next-generation amphibious ship (i.e., LPD(X)) in FY2023."[14]

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[8] For additional discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

[9] See, for example, Todd South, "Back to Ship: Marines Need Ships to Fight. Will They Get Them?" *Military Times*, March 24, 2022; Megan Eckstein, "Some Lawmakers Back Marines in Disagreement over Navy Amphib Force," *Defense News*, April 5, 2022; Caitlin M. Kenney, "Marines Push Light Amphib Warship While Navy Secretary Awaits Study," *Defense One*, April 5, 2022; Mallory Shelbourne, "Navy and Marines Divided Over the Amphibious Fleet's Future as Delays and Cancellations Mount in FY 2023 Budget Request," *USNI News*, April 3, 2022.

[10] Statement of Frederick J. Stefany, Principal Civilian Deputy, Assistant Secretary of the Navy (Research, Development and Acquisition), Performing The Duties Of The Assistant Secretary of the Navy (Research, Development and Acquisition), and Vice Admiral Scott Conn, Deputy Chief of Naval Operations, Warfighting Requirements And Capabilities (OPNAV N9), and Lieutenant General Karsten S. Heckl, Deputy Commandant, Combat Development and Integration, Commanding General, Marine Corps Combat Development Command, before the Subcommittee on Seapower of the Senate Armed Services Committee on Department of the Navy Fiscal Year 2023 Budget Request for Seapower, April 26, 2022, PDF page 12 of 37.

[11] See Megan Eckstein, "Amphib Ship Requirements Study Could Spell Bad News for Marines, Industry," *Defense News*, January 18, 2022.

[12] Megan Eckstgein, "US Navy Seeks to End San Antonio-Class Ship Production, Reducing Fleet by 8 Amphibious Hulls," *Defense News*, March 28, 2022.

[13] Mallory Shelbourne, "Navy and Marines Divided Over the Amphibious Fleet's Future as Delays and Cancellations Mount in FY 2023 Budget Request," *USNI News*, April 3, 2022; Caitlin M. Kenney, "Marines Push Light Amphib Warship While Navy Secretary Awaits Study," *Defense One*, April 5, 2022.

[14] U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year*

Light Amphibious Warship (LAW) Program[15]

Overview

As noted earlier, the LAW program may include up to 35 ships. A total of 35 would include nine operational LAWs for each of three envisioned Marine Littoral Regiments (MLRs), plus eight additional LAWs to account for factors such as a certain number of LAWs being in maintenance at any given moment. LAWs would be much smaller and individually much less expensive to procure and operate than the Navy's current amphibious ships.

Procurement Schedule

As noted earlier, the Navy had previously envisioned procuring the first LAW in FY2023, but the Navy's FY2023 budget submission defers the procurement of the first LAW to FY2025. The Navy's FY2023 five-year (FY2023-FY2027) shipbuilding plan calls for procuring the first LAW in FY2025, the second in FY2026, and the third and fourth in FY2027. The Navy's FY2023 budget submission states that the contract for the construction of the first LAW would be awarded in December 2024, and that the ship would be delivered in July 2028.

Procurement Cost

Under the Navy's FY2023 budget submission, the first LAW would be procured in FY2025 at a cost of $247.0 million, the second LAW would be procured in FY2026 at a cost of $203.0 million, and the third and fourth LAWs would be procured in FY2027 at a combined cost of $290.0 million (i.e., an average cost of $145.0 million each). The first LAW would cost substantially more than subsequent ships in the program because the procurement cost of the first LAW would include much or all of the detailed design/nonrecurring engineering (DD/NRE) costs for the class. (It is a traditional Navy budgeting practice to include much of all of the DD/NRE costs for a class of ship in the procurement cost of the lead ship in the class.)

By way of comparison, the Navy's most recently procured LHA-type amphibious ship has an estimated unit procurement cost in the Navy's FY2023 budget submission of about $3.5 billion, and LPD-17 Flight II amphibious ships have unit procurement costs of about $1.9 billion. As additional comparisons, the Navy's Ship-to-Shore Connectors (SSCs)—its new air-cushioned landing craft—are about 92 feet long and have a unit procurement cost of roughly $95 million, the Coast Guard's new Fast Response Cutters (FRCs) are 154 feet long and have a unit procurement cost of about $65 million, and the Navy's new TATS towing, salvage, and rescue ships are 263 feet long and have a unit procurement cost of about $96 million.

2023, April 2022, p. 14.

[15] Unless otherwise stated, information in this section about the LAW is taken from Navy briefing slides and Navy answers to industry questions from LAW program industry days that were held on March 4 and April 9, 2020, and posted on March 20, May 5, and May 7, 2020, at "RFI: US Navy Light Amphibious Warship (LAW)," https://beta.sam.gov/opp/90a9ece86ade48089e9f6d57d2969d23/view, accessed by CRS on May 15, 2020.

For press articles about the LAW, see Megan Eckstein, "Navy Researching New Class of Medium Amphibious Ship, New Logistics Ships," *USNI News*, February 20, 2020. See also Rich Abott, "FY 2021 Request Starts Work on Future Amphibs and Logistics Ships," *Defense Daily*, February 20, 2020; David Axe, "This Weird Little Ship Could Be the Future of Amphibious Warfare," *National Interest*, February 24, 2020; Mallory Shellbourne, "Navy begins pursuit of Light Amphibious Warship," *Inside Defense*, March 26, 2020; Joseph Trevithick, "Navy Wants To Buy 30 New Light Amphibious Warships To Support Radical Shift In Marine Ops," *The Drive*, May 5, 2020; Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

Operational Rationale, Including EABO

To improve their ability to perform various missions in coming years, including a potential mission of countering Chinese forces in a possible conflict in the Western Pacific, the Navy and Marine Corps want to implement a new operational concept called Distributed Maritime Operations (DMO).[16] DMO calls for U.S. naval forces (meaning the Navy and Marine Corps)[17] to operate at sea in a less concentrated, more distributed manner, so as to complicate an adversary's task of detecting, identifying, tracking, and targeting U.S. naval forces, while still being able to bring lethal force to bear against adversary forces.

In parallel with DMO, and with an eye toward potential conflict scenarios in the Western Pacific against Chinese forces, the Marine Corps has developed two supporting operational concepts, called Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO). Under the EABO concept, the Marine Corps envisions, among other things, having reinforced-platoon-sized Marine Corps units maneuver around the theater, moving from island to island, to fire anti-ship cruise missiles (ASCMs) and perform other missions so as to contribute, alongside Navy and other U.S. military forces, to U.S. operations to counter and deny sea control to Chinese forces.

More specifically, the Marine Corps states that the EABO concept includes, among other things, establishing and operating "multiple platoon-reinforced-size expeditionary advance base sites that can host and enable a variety of missions such as long-range anti-ship fires, forward arming and refueling of aircraft, intelligence, surveillance, and reconnaissance of key maritime terrain, and air-defense and early warning,"[18] The use of Marine Corps units to contribute to U.S. sea-denial operations against an opposing navy by shooting ASCMs would represent a new mission for the Marine Corps.[19]

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[16] For additional discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, by Ronald O'Rourke.

[17] Although the term *naval* is often used to refer specifically to the Navy, it more properly refers to both the Navy and Marine Corps, because both the Navy and Marine Corps are naval services. Even though the Marine Corps sometimes operates for extended periods as a land fighting force (as it has done in recent years, for example, in Afghanistan and Iraq), and is often thought of as the country's second land army, it nevertheless is, by law, a naval service. 10 U.S.C. §8001(a)(3) states, "The term 'member of the naval service' means a person appointed or enlisted in, or inducted or conscripted into, the Navy or the Marine Corps." DON officials sometimes refer to the two services as the Navy-Marine Corps team. For additional discussion, see CRS In Focus IF10484, *Defense Primer: Department of the Navy*, by Ronald O'Rourke.

[18] Emailed statement from Marine Corps as quoted in Shawn Snow, "New Marine Littoral Regiment, Designed to Fight in Contested Maritime Environment, Coming to Hawaii," *Marine Times*, May 14, 2020. See also David H. Berger, "Preparing for the Future, Marine Corps Support to Joint Operations in Contested Littorals," *Military Review*, April 2021, 8 pp.

[19] For press articles discussing these envisioned operations, see, for example, Justin Katz, "Marines' New Warfighting Concept Focuses on Small, Agile Forces with an Eye on China," *Breaking Defense*, December 1, 2021; Bill Gertz, "Marine Commandant Reveals New Mission Preparing for China Conflict," *Washington Times*, April 21, 2021; Megan Eckstein, "CMC Berger Outlines How Marines Could Fight Submarines in the Future," *USNI News*, December 8, 2020; David Axe, "Meet Your New Island-Hopping, Missile-Slinging U.S. Marine Corps," *Forbes*, May 14, 2020; Shawn Snow, "New Marine Littoral Regiment, Designed to Fight in Contested Maritime Environment, Coming to Hawaii," *Marine Times*, May 14, 2020; William Cole (Honolulu Star-Advertiser), "The Marine Corps Is Forming a First-of-its-Kind Regiment in Hawaii," *Military.com*, May 12, 2020; Joseph Trevithick, "Marines To Radically Remodel Force, Cutting Tanks, Howitzers In Favor Of Drones, Missiles," *The Drive*, March 23, 2020; Chris "Ox" Harmer, "Marine Boss's Audacious Plan To Transform The Corps By Giving Up Big Amphibious Ships," *The Drive*, September 5, 2019.

Light Amphibious Warships (LAWs) would be instrumental to these operations, with LAWs embarking, transporting, landing, and subsequently reembarking these small Marine Corps units. An August 27, 2020, press report states, "Maj. Gen. Tracy King, the director of expeditionary warfare on the chief of naval operations' staff (OPNAV N95), said today that LAW was perhaps the most important investment the Marine Corps was making to optimize itself for expeditionary advance base operations (EABO)."[20] A February 2021 Marine Corps tentative manual on EABO states

> Littoral maneuver will rely heavily on surface platforms such as the light amphibious warship (LAW) and a range of surface connectors, as well as aviation assets. The LAW is envisioned as the principal littoral maneuver vessel of the littoral force….
>
> The LAW supports the day-to-day maneuver of stand-in forces operating in the LOA [littoral operations area]. It complements L-class amphibious ships[21] and other surface connectors. Utilizing the LAW to transport forces of the surface reduces the impacts of tactical vehicles on the road network, increases deception, and allows for the sustainment of forces during embarkation. The range, endurance, and austere access of LAWs enable the littoral force to deliver personnel, equipment, and sustainment across a widely distributed area. Shallow draft and beaching capability are keys to providing the volume and agility to maneuver the required capabilities to key maritime terrain.
>
> LAW employment requires reconnaissance and prior planning relating to the bathymetry of the littoral environment. Effective LAW employment relies on knowledge of the beach makeup, slope, currents, tidal effects, and other environment factors.
>
> As envisioned and when properly postured, LAWs possess the range, endurance, speed, sea-keeping, and C4ISR capabilities to support and conduct complementary operations with, but not as part of, US Navy tactical groups, including an expeditionary strike group (ESG) or amphibious ready group (ARG). Forward-positioned LAWs may augment the capabilities of deploying ARG/MEUs during regional engagement and response to crises or contingencies.
>
> The LAW with embarked forces, generates and/or enables the following effects:
>
> - Rapidly maneuver forces from shore-to-shore in a contested environment
> - Sustain a combat-credible force ashore
> - Conduct enduring operations
> - Enable persistent joint-force operations and power projection
> - Provide increased and capable forward presence[22]

The survivability of the LAW ships would come from their ability to hide among islands and other sea traffic, from defensive support they would receive from other U.S. Navy forces, and from the ability of their associated Marine Corps units to fire missiles at Chinese ships and aircraft that could attack them with their own missiles (which can be viewed as an application of the notion that the best defense is a good offense).

[20] Megan Eckstein, "Marines Already In Industry Studies for Light Amphibious Warship, In Bid to Field Them ASAP," *USNI News*, August 27 (updated August 28), 2020. See also Paul McLeary, "'If It Floats, It Fights:' Navy's New Small Ship Strategy," *Breaking Defense*, August 28, 2020.

[21] The term *L-class amphibious ships* refers to the Navy's LHA/LHD- and LPD-type amphibious ships, whose designation begins with the letter L in reference to amphibious *landing*.

[22] Department of the Navy, Headquarters, U.S. Marine Corps, *Tentative Manual for Expeditionary Advanced Base Operations*, February 2021, pp. 7-9 to 7-10.

Ship Design

The Navy wants LAWs to be a relatively simple and relatively inexpensive ships with the following features, among others:

- a length of 200 feet to 400 feet;[23]
- a maximum draft of 12 feet;
- a displacement of up to 4,000 tons;[24]
- a ship's crew of no more than 40 Navy sailors;[25]
- an ability to embark at least 75 Marines;
- 4,000 to 8,000 square feet of cargo area for the Marines' weapons, equipment, and supplies;[26]
- a stern or bow landing ramp for moving the Marines and their weapons, equipment, and supplies the ship to shore (and vice versa) across a beach;
- a modest suite of C4I equipment;[27]
- a 25mm or 30mm gun system and .50 caliber machine guns for self-defense;
- a transit speed of at least 14 knots, and preferably 15 knots;[28]
- a minimum unrefueled transit range of 3,500 nautical miles;[29]

[23] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

[24] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

[25] A draft circular of requirements (CoR) attached to a request for information (RFI) on the Law program that Navy released on October 16, 2020, states that "The ship shall be capable of at least 11 day missions without replenishment for 40 crew and 50 embarked personnel." ("Light Amphibious Warship (LAW) Circular of Requirements (CoR), Draft for Preliminary Design RFI, Ver 0.12, 10-13-20, PDF page 6 of 19, attachment to "RFI: DRAFT US Navy Light Amphibious Warship Preliminary Design/Contract Design Statement of Work," Beta.sam.gov, accessed November 23, 2020, at https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp.)

[26] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020. A draft circular of requirements (CoR) attached to a request for information (RFI) on the Law program that Navy released on October 16, 2020, states that the "ship shall have a cargo deck capable of carrying 648 ST [short tons] and a minimum deck area of 8000" square feet. ("Light Amphibious Warship (LAW) Circular of Requirements (CoR), Draft for Preliminary Design RFI, Ver 0.12, 10-13-20, PDF page 5 of 19, attachment to "RFI: DRAFT US Navy Light Amphibious Warship Preliminary Design/Contract Design Statement of Work," Beta.sam.gov, accessed November 23, 2020, at https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp.)

[27] C4I is command and control, communications, computers, and intelligence.

[28] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020. A draft circular of requirements (CoR) attached to a request for information (RFI) on the Law program that Navy released on October 16, 2020, states that the "ship shall be capable of a minimum transit speed of 14 knots in Sea State three (SS3) at the ship's full load condition…." ("Light Amphibious Warship (LAW) Circular of Requirements (CoR), Draft for Preliminary Design RFI, Ver 0.12, 10-13-20, PDF page 6 of 19, attachment to "RFI: DRAFT US Navy Light Amphibious Warship Preliminary Design/Contract Design Statement of Work," Beta.sam.gov, accessed November 23, 2020, at https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp.)

[29] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020. A draft circular of requirements (CoR) attached to a request for information (RFI) on the Law program that Navy released on October 16, 2020, states that The ship shall be capable of 3500 nautical miles endurance at 14 knots without refueling at the ship's full load condition…." ("Light Amphibious Warship (LAW) Circular of Requirements (CoR), Draft for Preliminary Design RFI, Ver 0.12, 10-13-20, PDF page 6 of 19, attachment to "RFI: DRAFT US Navy Light Amphibious Warship Preliminary Design/Contract Design Statement of Work," Beta.sam.gov,

- a "Tier 2+" plus level of survivability (i.e., ruggedness for withstanding battle damage)—a level, broadly comparable to that of a smaller U.S. Navy surface combatant (i.e., a corvette or frigate), that would permit the ship to absorb a hit from an enemy weapon and keep the crew safe until they and their equipment and supplies can be transferred to another LAW;[30]
- an ability to operate within fleet groups or deploy independently; and
- a 20-year expected service life.[31]

In addition to the above points, the Navy states that the LAW's design can be based on a commercial-ship design.

A ship fitting the requirements listed above would be only a fraction as large as the Navy's current amphibious ships. The Navy's LHA/LHD-type ships are 844 to 855 feet long and have a full load displacements between 40,000 and 45,000 tons, while its and LPD-17 class ships are 684 feet long and have a full load displacement of 24,900 tons. As noted in the third bullet point above, the LAW is to have a displacement of up to 4,000 tons—about 1/10th or 1/11th the displacement of an LHA/LHD-type ship, and about 1/6th the displacement of an LPD-17 class ships.

The LAW's maximum draft of 12 feet is intended to permit the ship to transit shallow waters on its way to and from landing beaches. The Navy prefers that the ship's cargo space be in the form of open deck storage. Unlike most of the Navy's current amphibious ships, the LAW would not have a well deck.[32] A transit speed of about 15 knots would be less than the approximate 22-knot maximum sustained speed of larger U.S. Navy amphibious ships, but it is a relatively fuel-efficient speed for moving ships through water,[33] which would permit the ship to be equipped with a less powerful and consequently less expensive propulsion plant. The 20-year expected service life is less than the 30- to 45-year expected service lives of larger U.S. Navy amphibious ships—a difference that could reduce the LAW's construction cost for a ship of its type and size—and closer to the 25-year expected service life of the Navy's Littoral Combat Ships (LCSs).[34]

Figure 1, **Figure 2**, and **Figure 3** show one firm's LAW design. The design reportedly has a length of 120 meters (about 394 feet), a displacement of 4,500 tons, and 10,500 square feet of deck space for rolling stock or other cargoes.[35] The Navy's eventual preferred design for the LAW might or might not look like this design.

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accessed November 23, 2020, at https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp.)

[30] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

[31] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020. See also Mallory Shelbourne and Sam LaGrone, "Navy, Marines Want the Light Amphibious Warship to Haul 75 Marines for $150M or Less," *USNI News*, February 10, 2022.

[32] As noted in footnote 3, a well deck is a large, covered, garage-like space in the stern of the ship. It can be flooded with water so that landing craft can leave or return to the ship. Access to the well deck is protected by a large stern gate that is somewhat like a garage door.

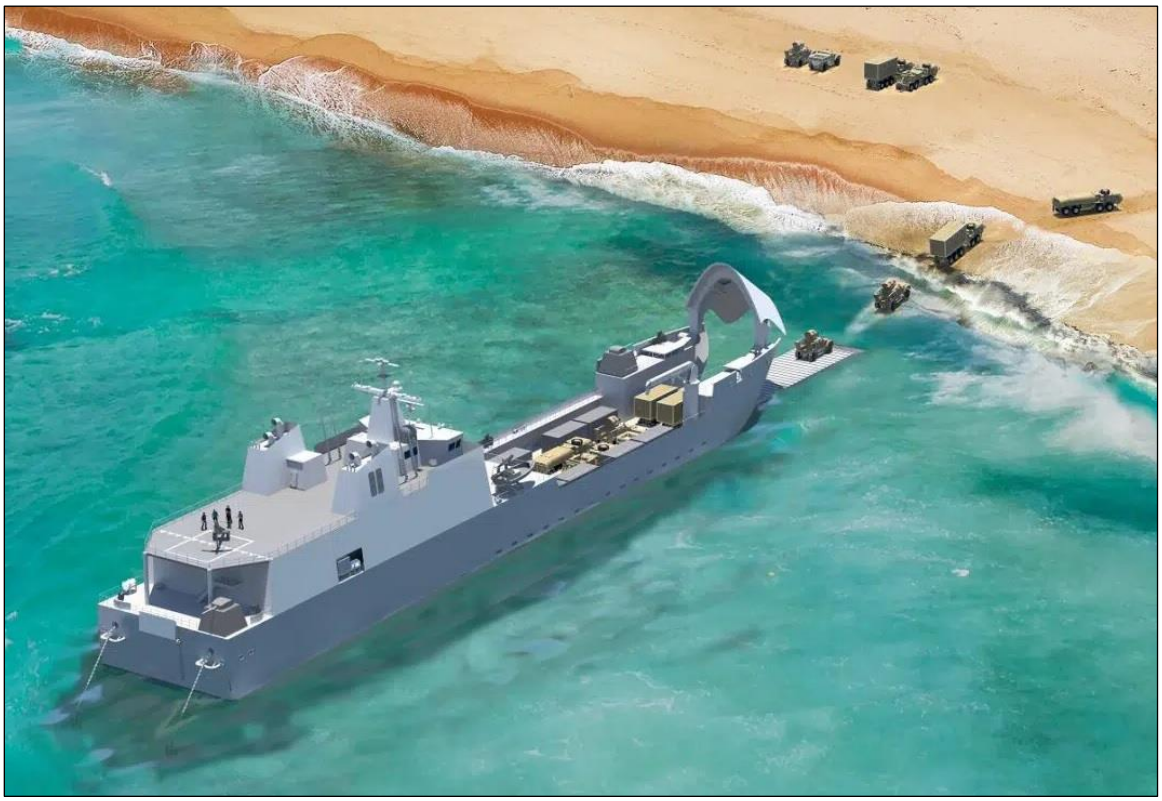
[33] Due to the density of water, fuel consumption for moving monohull ships through the water tends to increase steeply for speeds above 14 to 16 knots.

[34] For more on the LCS program, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[35] Martin Manaranche, "Sea Air Space 2021: Austal USA Unveils Its LAW Design," *Naval News*, August 3, 2021. See also Thomas Newdick, "Austal's Light Amphibious Warship Design Is A Throwback To WWII's Tank Landing Ships," *The Drive*, August 6, 2021.

Figure 1. One Firm's Design for LAW

Artist's rendering



Source: Cropped version of illustration of Austal USA's design for LAW accompanying Martin Manaranche, "Sea Air Space 2021: Austal USA Unveils Its LAW Design," *Naval News*, August 3, 2021. A caption credits the illustration to Austal.

Potential Builders

The LAW as outlined by the Navy could be built by any of several U.S. shipyards.

Acquisition Strategy

Overview

The Navy's baseline preference is to have a single shipyard build all the ships in the LAW program, but the Navy is open to having LAWs built in multiple yards to the same design if doing so could permit the program to be implemented more quickly and/or less expensively.[36] As noted

[36] The Q&A document from the Navy's April 9, 2020, industry day on the LAW program (see footnote 15) states

> Q [from industry]: Once [the industry] studies are done, what is the likelihood of [the Navy making] multiple [contract] awards [for the next stage]?
>
> A [from Navy]: When the [industry] studies are done, there will be multiple [contract] awards for preliminary design [work]. Then [the Navy will] down select for a [preferred] prototype. [There is] No plan for [building the ships at] multiple [ship]yards and [building them to multiple] designs like [the] LCS [Littoral Combat Ship program]. It's too hard of a logistics tail [to provide lifecycle support for ships built to multiple designs]. But options are open if it is cheaper/faster.

earlier, the Navy's FY2023 budget submission states that the contract for the construction of the first LAW would be awarded in December 2024.

Figure 2. One Firm's Design for LAW

Photograph of model displayed at trade show

Source: Cropped version of photograph of model of Austal USA's design for LAW accompanying Martin Manaranche, "Sea Air Space 2021: Austal USA Unveils Its LAW Design," *Naval News*, August 3, 2021. The model was displayed at the Sea Air Space 2021 exposition.

Reported July 2020 Contract Awards

An October 6, 2020, press report stated that the Navy in July 2020 awarded contracts for LAW concept design studies to 15 firms, with the studies due in November 2020. According to the press report, the 15 companies awarded contracts included Austal USE, BMT Designers, Bollinger Shipyards, Crescere Marine Engineering, Damen, Hyak Marine, Independent Maritime Assessment Associates, Nichols Brothers Boat Builders, Sea Transport, Serco, St John Shipbuilding, Swiftships, Technology Associates, Thoma-Sea, and VT Halter Marine. The studies reportedly were intended to help inform concepts of operation, technical risk, and cost estimates for the LAW program, in support of a planned lead-ship contract award in FY2022. An August 27, 2020, press report states

> The Navy and Marine Corps' new Light Amphibious Warship program is already in industry studies, with the service pushing ahead as quickly as possible in an acknowledgement that they're already behind in their transformation of the force.
>
> Maj. Gen. Tracy King, the director of expeditionary warfare on the chief of naval operations' staff (OPNAV N95), said today that LAW was perhaps the most important

---

Q [from industry]: Do you envision something similar to LCS variance [sic: variants]? Multiple yards and designs?

A [from Navy]: No, it involves too much logistics and O&S [operation and support costs]. This drives overall costs initially [i.e., locks higher life-cycle support costs into the program from the outset of the program] and we're not trying to go down that path. As we've said before, if studies tell us we are wrong, if it's affordable and fields faster, then we won't ignore it. The data and cost drivers will help us decide. The Government wants to field [the ships] as rapidly as possible, and we believe that using multiple yards is not the best and most affordable path.

investment the Marine Corps was making to optimize itself for expeditionary advance base operations (EABO).

"Having these LAWs out there as an extension of the fleet, under the watchful eye of our Navy, engaging with our partners and allies, building partner capacity, is what I think we need to be doing right now. I think we're late to need with building the Light Amphibious Warship, which is why we're trying to go so quickly," he said, saying that N95 was copying the surface warfare directorate's playbook from the frigate program, which moved quickly from requirements-development to design to getting under contract thanks to the use of mature technology and designs from industry.[37]

Figure 3. One Firm's Design for LAW

Photograph of model displayed at trade show

Source: Cropped version of photograph of model of Austal USA's design for LAW accompanying Martin Manaranche, "Sea Air Space 2021: Austal USA Unveils Its LAW Design," *Naval News*, August 3, 2021. The model was displayed at the Sea Air Space 2021 exposition.

October 2020 Request for Information (RFI)

On October 16, 2020, the Navy released a request for information (RFI) to solicit industry input on draft versions of documents relating to an eventual solicitation for conducting design work on the ship.[38]

[37] Megan Eckstein, "Marines Already In Industry Studies for Light Amphibious Warship, In Bid to Field Them ASAP," *USNI News*, August 27 (updated August 28), 2020. See also Rich Abott, "Marine Corps In Industry Studies For Light Amphibious Warship, Trying To Move Quickly," *Defense Daily*, August 28, 2020.

[38] See "RFI: DRAFT US Navy Light Amphibious Warship Preliminary Design/Contract Design Statement of Work," Beta.sam.gov, accessed November 23, 2020, at https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp. See also Rich Abott, "Navy Issues RFI For Light Amphibious Warship Preliminary Design," *Defense Daily*, October 19, 2020; Aidan Quigley, "Navy Solicits Light Amphibious Warship Preliminary Designs," *Inside Defense*, October 19, 2020.

November 2020 Press Report About Concept Designs

A November 9, 2020, press report stated that, as part of its LAW industry studies, the Navy had received nine LAW concept designs from 16 design firms and shipyards, some of which have paired into teams. The report quoted a Navy official as stating that the following firms were participating in the industry studies: Austal USA, BMT Designers, Bollinger Shipyards, Crescere Marine Engineering, Damen, Hyak Marine, Independent Maritime Assessment Associates, Nichols Brothers Boat Builders, Sea Transport, Serco, St. John Shipbuilding, Swiftships, Technology Associates Inc., Thoma-Sea, VT Halter Marine and Fincantieri.[39] A November 19, 2020, press report stated that "about six industry teams are working with the sea services [i.e., the Navy and Marine Corps] after two industry days and industry studies over the summer.[40]

A January 11, 2021, press report stated

> The Navy and Marine Corps are quickly seeking new ideas that allow Marines to support the Navy in sea control and other maritime missions, including the rapid acquisition of a light amphibious ship and a movement toward using Marine weapons while at sea.
>
> Maj. Gen. Tracy King, the director of expeditionary warfare on the chief of naval operations' staff (OPNAV N95), told USNI News during a Jan. 8 media call that the services are moving quickly to buy their first light amphibious warship (LAW) in Fiscal Year 2022, as outlined in the recent long-range shipbuilding plan.
>
> "We're moving out at flank speed; I got a chance to brief the CNO and the commandant recently, and they told me to maintain course and heading," he said during the media call ahead of the annual Surface Navy Association symposium.
>
> "We're going through the formal JCIDS (Joint Capabilities Integration and Development System) process right now. [Naval Sea Systems Command] has completed its second industry studies, and we're working on all those documents."
>
> For now, 10 or 11 industry teams remain involved in the NAVSEA competition, which recently held a second round of industry studies. NAVSEA is working with those teams to help iterate what King called "novel" designs, to ensure they were the right size and could achieve cost and performance requirements. Mid next year, he said, NAVSEA would downselect to three teams for full design, and then would downselect to just one to build the first LAW in late FY2022.
>
> "My suspicion is that we'll begin [research, development, test and evaluation] next year, and then we are aiming at lead ship construction in FY '22, it's going to be late in FY '22 ,but I still consider that pretty fast," King said.
>
> "We're just going to build one, get that out and start playing with it. We'll probably build one the next year because we've got to get the doctrine right. The [Marine Littoral Regiments] are going to start coming online at about the same time – first one's in Hawaii, we'll get it out there and let them play with it. And then we'll go into a build profile of, I don't know, probably four or five a year or something like that is what we're going to aim for."[41]

[39] Aidan Quigley, "Nine Concept Designs Submitted for LAW Industry Studies," *Inside Def*ense, November 9, 2020.

[40] Megan Eckstein, "Navy Officials Reveal Details of New $100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

[41] Megan Eckstein, "Marines, Navy Moving Quickly on Light Amphib, Anti-Ship Missiles to Create More Warfighting Options," *USNI News*, January 11, 2021. Material in brackets as in original. See also Rich Abott, "Kilby Outlines Factors Leading To Faster New Light Amphib Development," *Defense Daily*, February 5, 2021.

June 2021 Contract Awards

A June 17, 2021, press report states

> The Navy this week issued "concept design" contracts to five companies for the Light Amphibious Warship ahead of the Fiscal Year 2023 design selection, a service spokesman confirmed to USNI News.
>
> Fincantieri, Austal USA, VT Halter Marine, Bollinger and TAI Engineers were selected for the contracts, Naval Sea Systems Command spokesman Alan Baribeau said.
>
> "A Concept Studies (CS) contract has been awarded to five offerors with a follow-on option for Preliminary Design (PD)," Baribeau said in a statement. "The CS/PD efforts include engineering analyses, tradeoff studies, and development of engineering and design documentation defining concepts studies/preliminary designs."
>
> The Navy did not disclose the amount of money each company received to perform the work, but Baribeau confirmed to USNI News that the total combined amount of the contracts was less than $7.5 million.[42]

A February 10, 2022, press report states

> Moving ahead, the services [i.e., the Navy and Marine Corps] expect a "full and open competition" once they issue the request for proposals for the detail[ed] design and construction phase, according to Tom Rivers, the executive director of the amphibious, auxiliary and sealift office within the Program Executive Office for Ships.
>
> After issuing five companies "concept design" contracts last year, those same five companies recently received options for the preliminary design phase, Rivers said. The companies working on the preliminary design are Fincantieri, Austal USA, VT Halter Marine, Bollinger and TAI Engineers.
>
> "So LAW—the initial thought process is based upon parent designs [i.e., existing ship designs from which the design for LAW could be derived] that are already out there in the world today to, again, to reduce our risks," Rivers said at the conference. "As new requirements are generated out of the Pentagon, we actually are sharing those with the shipyards so they can kind of see what we're thinking about how it evolves over time and then they can kind of build that into the—and they come back to us and say, 'hey here's the impact of that particular change on our configuration.' Either it's small or large and then we take that in consideration into the final requirements."
>
> This type of process is helping the Navy determine what it can do with the various parent designs, Rivers said.[43]

FY2023 Funding Request

The Navy's proposed FY2023 budget requests $12.2 million in research and development funding for the program. The funding is requested in Project 4044 (Next Generation Medium Amphibious Ship) of PE (Program Element) 0603563N (Ship Concept Advanced Design), which is line number 46 in the Navy's FY2023 research and development account.

[42] Mallory Shelbourne, "Navy Awards 5 Companies Light Amphibious Warship 'Concept Design' Contracts," *USNI News*, June 17, 2021.

[43] Mallory Shelbourne and Sam LaGrone, "Navy, Marines Want the Light Amphibious Warship to Haul 75 Marines for $150M or Less," *USNI News*, February 10, 2022. See also Aidan Quigley, "Five Shipbuilders Emerge as Leading Light Amphibious Warship Contenders," *Inside Defense*, February 2, 2022.

Issues for Congress

The LAW program poses a number of potential oversight matters for Congress, including those discussed briefly in the sections below.

Deferral of Lead Ship Procurement to FY2025

As noted earlier, previous Navy plans envisioned starting procurement of LAWs in FY2023. Compared to the previously envisioned start of procurement in FY2023, the Navy's FY2023 five-year shipbuilding plan in effect defers the start of LAW procurement two years, to FY2025. A March 30, 2022, press report stated

> "The Marine Corps and the Department are getting the requirements tight on that ship before we choose to put it in our [shipbuilding appropriations account]. So there is funding in R&D for LAW," Rear Adm. John Gumbleton, Deputy Assistant Secretary of the Navy for Budget, told reporters during a roundtable ahead of the [FY2023] budget release Monday [March 28].[44]

Potential oversight questions for Congress include the following:

- Why does the Navy need an additional two years of time to study requirements for the LAW? What has changed that would require that much additional time for the study of operational requirements?
- What impact will the two-year deferral have in terms of reducing technical, schedule, and cost risk in the LAW program? What impact will it have on Navy-Marine Corps capabilities and operational risks over the next several years?

Future Amphibious Ship Force-Level Goal

Another issue for Congress concerns the future amphibious ship force-level goal, which could affect future procurement quantities for LAWs. A related potential oversight issue for Congress concerns how the LAW would fit into the Navy's overall future fleet architecture. Potential oversight questions for Congress include the following:

- Has the navy completed its study of amphibious ship force-level requirements? When does the Navy anticipate informing Congress of the results of the study?
- What is the analytical basis for the envisioned procurement quantity of up to 35 LAWs?[45]
- How well can the cost-effectiveness of a force of up to 35 LAWs be assessed if the remainder of the Navy's amphibious ship fleet architecture is not yet fully known?

EABO Operational Concept

Another potential oversight issue for Congress concerns the merits of the EABO operational concept that the LAW is intended to help Marine Corps implement. Debate on the merits of the EABO concept concerns issues such as

[44] Rich Abott, "First Light Amphibious Warship Purchase Pushed Back To 2025," *Defense Daily*, March 30, 2022.

[45] For an article that raises questions concerning the analytical foundation for the LAW program, see Daniel Goure, "Light Amphibious Warship: A Mistake For The U.S. Marine Corps And Navy?" *19FortyFive*, July 27, 2021.

- whether the concept is focused too exclusively on potential conflict scenarios with China at the expense of other kinds of potential Marine Corps missions;
- the ability of Marine forces to gain access to the islands from which they would operate;
- the ability to resupply Marine forces that are operating on the islands;[46]
- the survivability of Marine forces on the islands and in surrounding waters;[47]
- how much of a contribution the envisioned operations by Marine forces would make in contributing to overall U.S. sea-denial operations; and
- potential alternative ways of using the funding and personnel that would be needed to implement EABO.[48]

Potential oversight questions for Congress include the following:

- What are the potential benefits, costs, and risks of the EABO concept?
- What work have the Navy and Marine Corps done in terms of analyses and war games to develop and test the concept?
- Would EABO be more cost effective to implement than other potential uses of the funding and personnel?

Accuracy of Estimated Procurement Cost

Another potential oversight issue for Congress concerns the accuracy of the navy's estimated procurement cost target for the LAW. Potential oversight questions for Congress include the following:

- Is the Navy's estimate reasonable, given the features the Navy wants the ship to have?
- As the LAW program proceeds, will the operational requirements (and thus procurement cost) of the LAW increase?

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[46] See, for example, John M. Doyle, "Berger Says Supporting a Widely Distributed Maritime Force Will Be a Challenge," *Seapower*, May 14, 2021.

[47] See, for example, Yasmin Tadjdeh, "Light Amphibious Warships Face Survivability Questions," *National Defense*, April 23, 2021. See also John M. Doyle, "Navy, Marine Corps Labs Exploring How to Keep Advanced Bases Supplied and Safe," Seapower, February 10, 2022.

[48] For a CRS report on the proposed redesign of the Marine Corps to support new operational concepts such as EABO, see CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiative: Force Design 2030*, by Andrew Feickert.

For press articles discussing the proposed redesign of the Marine Corps to support new operational concepts such as EABO, see Gary Anderson, "The Marine Corps' Intellectual Civil War," *Military.com*, April 28, 2022; Charles Krulak, Jack Sheehan, and Anthony Zinni, "War Is a Dirty Business. Will the Marine Corps Be Ready for the Next One?" *Washington Post*, April 22, 2022; Anthony Zinni, "What Is the Role of the Marine Corps in Today's Global Security Environment?" *Task and Purpose*, April 19, 2022; Philip Athey, "First to Fight: Is This the End of the Corps as America's 911 Force?" *Marine Corps Times*, April 12, 2022; Otto Kreisher, "Controversial EABO Concept Has Potential but Will Be Vetted, Speakers Say," *Seapower*, April 5, 2022; Konstantin Toropin, "After a Barrage of Editorials and Critiques, Marine Leaders Defend Restructuring Plan," *Military.com*, April 5, 2022; Craig Hooper, "Let The Marine Corps Build The New Light Amphibious Warship," *Forbes*, April 3, 2022; Mallory Shelbourne, "Navy and Marines Divided Over the Amphibious Fleet's Future as Delays and Cancellations Mount in FY 2023 Budget Request," *USNI News*, April 3, 2022; Paul McLeary and Lee Hudson, "How Two Dozen Retired Generals Are Trying to Stop an Overhaul of the Marines," *Politico*, April 1, 2022; Noel Williams, "Insights for Marine (and Beyond) Force Design from the Russo-Ukrainian War," *War on the Rocks*, March 31, 2022; Jim Webb, "Momentous Changes in the U.S. Marine Corps' Force Organization Deserve Debate," *Wall Street Journal*, March 25, 2022; Paul K. Van Riper, "Jeopardizing national security: What is happening to our Marine Corps?" *Marine Corps Times*, March 21, 2022.

In connection questions such as these, a September 21, 2020, press report states

> The U.S. Marine Corps is moving as fast as it can to field a new class of light amphibious warship, but it remains unclear what it will do, where it will be based or what capabilities it will bring to the fight.
>
> The idea behind the ship is to take a commercial design or adapt a historic design to make a vessel capable of accommodating up to 40 sailors and at least 75 Marines to transport Marine kit over a range of about 3,500 nautical miles, according to a recent industry day presentation.
>
> While the presentation noted that the ship should have few tailored Navy requirements, that also creates a problem: If the Navy is going to pay tens of millions to develop, build, crew and operate them, should it not provide some additional value to the fleet [beyond its currently envisioned role]?
>
> Analysts, experts and sources with knowledge of internal discussions who spoke to Defense News say the answer to that question is a source of friction inside the Pentagon….
>
> When asked whether the ship should contribute to a more distributed sensor architecture to align with the Navy's desire to be more spread out over a large area during a fight, [he chief of naval operations' director of expeditionary warfare, Maj. Gen. Tracy King] answered in the affirmative.
>
> "[But] I really see it benefiting from [that architecture] more," he said. "We need to build an affordable ship that can get after the ability to do maritime campaigning in the littorals."
>
> The unstated implication appeared to be that if the ship is loaded up with sensors and requirements, it will slow down the process and increase the cost. Analysts who spoke to Defense News agreed with that, saying the Navy is likely trying to put more systems on the platform that will make it more complex and more expensive….
>
> "The hardest part is going to be appetite suppression, especially on the part of the Navy," said Dakota Wood, a retired Marine officer and analyst with The Heritage Foundation. "This is what we saw in the littoral combat ship LCS:[49] It started out as a very light, near-shore, small and inexpensive street fighter. And then people started adding on requirements. You had ballooning costs, increasing complexity of the platform, and you get into all kinds of problems…."
>
> [Jerry Hendrix, a retired Navy captain and analyst with the Telemus Group] acknowledged that the Navy has good reason to want the light amphibious warship to have more capability, but added that the Corps is more interested in something simple than something costly and elaborate.
>
> "What that does," Hendrix said, "is drive up unit cost and drive down the numbers that can be purchased."[50]

Potential Alternative of Adapting Existing Army LSVs

Another potential issue for Congress is whether at least some portion of the operational requirements for the LAW program could be met cost effectively met by adapting existing U.S. military ships rather than building new LAWs. Some observers, for example, argue that at least some portion of the operational requirements for the LAW program could be met more cost-

[49] For more on the LCS program, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[50] David B. Larter, "US Marines Wants to Move Fast on a Light Amphibious Warship. But What is It?" *Defense News*, September 21, 2020.

effectively by transferring existing Army watercraft known as Logistics Support Vessels (LSVs) (**Figure 4**) to the Navy and adapting these LSVs to the LAW mission.

Figure 4. Besson-Class Logistics Support Vessel (LSV)

Source: Cropped version of photograph accompanying Walker D. Mills and Joseph Hanacek, "The US Navy and Marine Corps Should Acquire Army Watercraft," *Defense News*, June 22, 2020. The caption to the photograph credits the photograph to the U.S. Navy and states, "U.S. Navy sailors conduct a simulated disaster relief supply offload from a General Frank S. Besson-class logistics support vessel at Joint Base Pearl Harbor-Hickam on July 10, 2016."

A June 22, 2020, opinion piece discussing this idea states

> The Navy intends to acquire up to 30 new light amphibious warships, or LAW, to support new Marine Corps requirements.… Rather than accepting a new amphibious design built from the ground up, however, decision-makers should take advantage of the fact that many key requirements of the new vessels are very similar to the capabilities of vessels operated by U.S. Army Transportation Command.
>
> The Navy and Marine Corps should delay any new construction and immediately acquire some of these existing vessels to drive experimentation and better inform their requirements for the LAW program….
>
> U.S. Army Transportation Command has over 100 vessels, and dozens have similar capabilities to those required of the LAW. The Army's LCU-2000s, also called the Runnymede-class large landing crafts, are smaller, with roughly half of the cargo space designed for the LAW and slightly slower, but they boast nearly double the range. The Runnymede-class vessels have nearly 4,000 square feet of cargo space and can travel 6,500 miles when loaded and at 12 knots; and they can unload at the beach with their bow ramp.
>
> The Army's General Frank S. Besson-class logistics support vessels are larger than the future LAW, at 273 feet in length but can claim 10,500 square feet of cargo space and a 6,500-mile range loaded to match the LCU-2000. These vessels also have both a bow and stern ramp for roll-on/roll-off capability at the beach or ship-to-ship docking at sea. The version built for the Phillipine military also has a helipad.
>
> Army Transportation Command has 32 Runnymede-class and eight General Frank S. Besson-class vessels in service. Mostly built in the 1990s, both classes of vessel have many

> years left in their life expectancy and more than meet the Navy's 10-year life expectancy for the LAW.
>
> These vessels are operable today and could be transferred from the Army to the Navy or Marine Corps tomorrow. In fact, the Army was attempting to divest itself of these watercraft less than a year ago, which underscores the importance of this opportunity even further. Congress is firmly set against the Army getting rid of valuable, seaworthy vessels and has quashed all of the Army's efforts to do so thus far, but transferring this equipment to the Navy is a reasonable course of action that should satisfy all parties involved….
>
> By acquiring a watercraft that meets most of their requirements from the Army, the Navy and Marine Corps simultaneously fill current capability gaps and obtain an invaluable series of assets they can use to support the evaluation and experimentation of new designs and concepts. This will allow Navy and Marine leaders to give their units the maximum amount of time to evaluate and experiment with new designs to get a better idea of what they need both in future amphibious craft as well as operational and support equipment….
>
> Often overlooked, the availability of surplus vessels is absolutely critical to the process of developing new technologies, developing the tactics to employ them, conducting training, and providing decision-makers the requisite capacity to remain flexible in the face of unexpected challenges….
>
> [The Navy and Marine Corps have] long been in need of a boost in their amphibious capabilities so as to be better positioned to meet the demands of today and prepare for the challenges of tomorrow, and taking possession of the Army's Runnymede- and Frank S. Benson-class vessels is a solution on a silver platter.[51]

Potential questions for Congress include the following:

- How many of these watercraft would be available for transfer to the Navy for use in meeting the operational requirements of the LAW program?
- How do the capabilities of these watercraft compare with those required for the LAW?
- How much remaining service life do these watercraft have?
- Given the number of these watercraft that would be available for transfer to the Navy, their operational capabilities, and their remaining service life, what portion of the LAW program's operational requirements could transferred watercraft meet? How many LAWs, if any, would still need to be built to fully or substantially meet the LAW program's operational requirements?
- How do the acquisition and operation and support (O&S) costs of these watercraft compare to the estimated acquisition and O&S costs of the LAWs they would replace?
- Taking into account capabilities, acquisition costs, and O&S costs, how does the cost effectiveness of an approach involving the transfer of these watercraft compare to that of the Navy's baseline approach of meeting the LAW program's requirements through the acquisition of 24 to 35 new LAWs?
- What would be the potential industrial-base implications of using transferred watercraft to meet at least some portion of the LAW program's operational needs?

[51] Walker D. Mills and Joseph Hanacek, "The US Navy and Marine Corps Should Acquire Army Watercraft," *Defense News*, June 22, 2020. See also William Cole, "Army Vessels Could Be Transferred To Marines To Counter China Threat," *Honolulu Star-Advertiser*, February 7, 2022.

Industrial-Base Implications

Another potential oversight issue for Congress concerns the potential industrial-base implications of the LAW program. In recent years, all Navy amphibious ships have been built by the Ingalls shipyard of Pascagoula, MS, a part of Huntington Ingalls Industries (HII/Ingalls). As noted earlier, LAWs could be built by multiple U.S. shipyards.[52] Potential oversight questions for Congress include, What implications might the LAW program have for the distribution of Navy shipbuilding work among U.S. shipyards? How many jobs would the LAW program create at the shipyard that builds the ships, at associated supplier firms, and indirectly in surrounding communities? In a situation of finite defense resources, what impact, if any, would funding the procurement of LAWs have on funding available for procuring other types of amphibious ships, and thus on workloads and employment levels at HII/Ingalls, its associated supplier firms, and their surrounding communities?[53]

Legislative Activity for FY2023

Summary of Congressional Action on FY2023 Funding Request

Table 1 summarizes congressional action on the FY2023 procurement funding request for the LAW program.

Table 1. Congressional Action on FY2023 Procurement Funding Request

Millions of dollars, rounded to nearest tenth

		Authorization			Appropriation		
	Request	HASC	SASC	Enacted	HAC	SAC	Enacted
Research and development	12.2						

Source: Table prepared by CRS based on Navy's FY2023 budget submission, committee and conference reports, and explanatory statements on FY2023 National Defense Authorization Act and FY2023 DOD Appropriations Act. The funding is requested in Project 4044 (Next Generation Medium Amphibious Ship) of PE (Program Element) 0603563N (Ship Concept Advanced Design), which is line 46 in the Navy's FY2023 research and development account.

Notes: HASC is House Armed Services Committee; **SASC** is Senate Armed Services Committee; **HAC** is House Appropriations Committee; **SAC** is Senate Appropriations Committee.

[52] 10 U.S.C. §8679 requires that, subject to a presidential waiver for the national security interest, "no vessel to be constructed for any of the armed forces, and no major component of the hull or superstructure of any such vessel, may be constructed in a foreign shipyard." In addition, the paragraph in the annual DOD appropriations act that makes appropriations for the Navy's shipbuilding account (the Shipbuilding and Conversion, Navy account) typically contains these provisos: " … *Provided further*, That none of the funds provided under this heading for the construction or conversion of any naval vessel to be constructed in shipyards in the United States shall be expended in foreign facilities for the construction of major components of such vessel: *Provided further*, That none of the funds provided under this heading shall be used for the construction of any naval vessel in foreign shipyards…."

[53] Two observers argue that shifting the Navy to a fleet architecture that includes a larger proportion of smaller ships would have beneficial impacts on U.S. shipbuilding industry's ability to support Navy shipbuilding needs. See Bryan Clark and Timothy A. Walton, "Shipbuilding Suppliers Need More Than Market Forces to Stay Afloat," *Defense News*, May 20, 2020.

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