

# **Navy Medium Landing Ship (LSM) (Previously Light Amphibious Warship [LAW]) Program: Background and Issues for Congress**

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## **Navy Medium Landing Ship (LSM) (Previously Light Amphibious Warship [LAW]) Program: Background and Issues for Congress**

The Navy's Medium Landing Ship (LSM) program, previously called the Light Amphibious Warship (LAW) program, envisions procuring a class of 18 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 wants to procure the first LSM in FY2025. The Navy's proposed FY2024 budget requests \$14.7 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 LSMs would be instrumental to these operations, with LSMs embarking, transporting, landing, and subsequently reembarking these small Marine Corps units.

LSMs would be much smaller and individually much less expensive to procure and operate than the Navy's current amphibious ships. Under the Navy's FY2024 budget submission, the first LSM would be procured in FY2025 at a cost of \$187.9 million, the second LSM would be procured in FY2026 at a cost of \$149.2 million, the third and fourth LSMs would be procured in FY2027 at a combined cost of \$297.0 million (i.e., an average cost of about \$148.5 million each), and the fifth and sixth LSMs in FY2028 at a combined cost of \$296.2 million (i.e., an average of about \$148.1 million each). The first LSM would cost more than subsequent ships in the program because the procurement cost of the first LSM 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 LSM 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 FY2024 budget submission states that the contract for the construction of the first LSM would be awarded in December 2024, and that the ship would be delivered in July 2028.

The LSM 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 Medium Landing Ship (LSM) program, previously called the Light Amphibious Warship (LAW) program. The LSM program envisions procuring a class of 18 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 wants to procure the first LSM in FY2025. The Navy's proposed FY2024 budget requests \$14.7 million in research and development funding for the program.

The LSM 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.<sup>1</sup> Other CRS reports provide an overview of Navy force structure and shipbuilding plans<sup>2</sup> and the Marine Corps' overall plan for redesigning its units and equipment to meet future mission demands, called Force Design 2030, of which the LSM program is a part.<sup>3</sup>

## 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

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

<sup>2</sup> CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke

<sup>3</sup> CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiative: Force Design 2030*, by Andrew Feickert.

ship to shore without need for port facilities,<sup>4</sup> amphibious ships are potentially useful for a range of combat and noncombat operations.<sup>5</sup>

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.<sup>6</sup> As mentioned earlier, a separate CRS report discusses the Navy's current programs for procuring new LHA- and LPD-type ships.<sup>7</sup> The LSMs discussed in this CRS report would be much smaller than the Navy's current amphibious ships.

## Amphibious Ship Force-Level Goal Under 355-Ship 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 larger 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).<sup>8</sup> This 38-ship force-level goal predates the LSM program and consequently includes no LSMs.

<sup>4</sup> 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.)

<sup>5</sup> Amphibious ships and their embarked Marine forces can be used for launching and conducting humanitarian-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.

<sup>6</sup> 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 4. The terms "large-deck" and "small-deck" refer to the size of the ship's flight deck.

<sup>7</sup> CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>8</sup> 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.

## Amphibious Ship Force at End of FY2022 and Projected for End of FY2024

The Navy's force of amphibious ships at the end of FY2022 included 31 larger ships, including 9 amphibious assault ships (2 LHAs and 7 LHDs), 12 LPD-17 Flight I class ships, and 10 older LSD-41/49 class ships. The Navy's FY2024 budget submission projects that the Navy at the end of FY2024 will include 29 larger amphibious ships, including 9 LHA/LHD-type ships, 13 LPD Flight I class ships, and 7 LSD-41/49 class ships.

## Emerging New Amphibious Ship Force-Level Goal

The Navy and OSD have been working since 2019 to develop a new force-level goal to replace the Navy's 355-ship force-level goal, but have not been able to come to closure on a successor goal. Required numbers of amphibious ships are reportedly a major issue in the ongoing discussion. 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 LSMs.<sup>9</sup> Marine Corps officials state that, from their perspective, a minimum of 66 larger and smaller amphibious ships will be required in coming years, including a minimum of 31 larger amphibious ships (10 LHAs/LHDs and 21 LPD-17s) plus 35 LSMs (aka "31+35").<sup>10</sup> Marine Corps officials have stated that a force with fewer than 31 larger amphibious ships would increase operational risks in meeting demands from U.S. regional combatant commanders for forward-deployed amphibious ships and for responding to contingencies.<sup>11</sup>

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.<sup>12</sup>

<sup>9</sup> For additional discussion, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

<sup>10</sup> 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.

<sup>11</sup> See, for example, Caitlin M. Kenney, "'We Didn't Have the Ships' to Send 'Best Option' to Help Earthquake Victims, Commandant Says," *Defense One*, February 15, 2023; Caitlin M. Kenney, "Marines Issue Warning on Amphib Fleet, The Assistant Commandant Says 31 Large Amphibious Warfare Ships Are Needed to Avoid Risk," *Defense One*, February 14, 2023.

<sup>12</sup> 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.

In January 2022, Navy officials reportedly anticipated that the above-mentioned study would be completed by the end of March 2022.<sup>13</sup> At the end of March 2022, the study reportedly was expected to be completed shortly.<sup>14</sup> At the beginning of April 2022, the study reportedly was in its final stages.<sup>15</sup>

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."<sup>16</sup>

A January 20, 2023, press report states:

The long-awaited Navy study to determine the future makeup of the U.S. amphibious warship fleet has finally made it to Congress, but don't hold your breath for the results: they're classified.

The Navy sent the Amphibious Force Requirements Study to the Congressional defense committees on Dec. 28, Lt. Gabrielle Dimaapi, a spokeswoman for the Navy secretary, said in an email statement Friday to Defense One.

The study was "closely coordinated with the Office of the Secretary of Defense Cost Analysis and Program Evaluation and Office of Management and Budget prior to providing it to Congress," Dimaapi said. It "assessed the risk associated with the size and composition of the future amphibious warship fleet. It focused on both traditional and planned amphibious warships and platforms."

Though the service "is not planning to release an unclassified summary of the report," the results "will be incorporated into an ongoing battle force ship assessment that will be published later this year," she said.

But it's unclear how much of the amphibious ship study results will be revealed in the battle force ship assessment. Last year's assessment was also classified, and only the top-level number of 373 ships was released, U.S. Naval Institute News reported.

Navy Secretary Carlos Del Toro has been promising for months that the amphibious ship study would be ready in a matter of weeks, even testifying to that during a May Senate Armed Services Committee hearing. When no study materialized, Sens. Tim Kaine, D-Va., and Roger Wicker, R-Miss., sent a letter in November to Del Toro asking for the study. In early December, the secretary told reporters the document was almost ready, but was still "being briefed to senior leadership."<sup>17</sup>

## **FY2023 NDAA Provisions Regarding Amphibious Ship Force-Level Goal**

The FY2023 National Defense Authorization Act (NDAA) (H.R. 7776/P.L. 117-263 of December 23, 2022) included the following provisions relating to the amphibious ship force-level goal:

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<sup>13</sup> See Megan Eckstein, "Amphib Ship Requirements Study Could Spell Bad News for Marines, Industry," *Defense News*, January 18, 2022.

<sup>14</sup> Megan Eckstein, "US Navy Seeks to End San Antonio-Class Ship Production, Reducing Fleet by 8 Amphibious Hulls," *Defense News*, March 28, 2022.

<sup>15</sup> 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.

<sup>16</sup> U.S. Navy, *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2023*, April 2022, p. 14.

<sup>17</sup> Caitlin M. Kenney, "Navy Won't Publicly Release Results of Amphibious Ship Study, The Study, Which Had Been Delayed for Months, Has Been Sent to Lawmakers," *Defense One*, January 20, 2023.



- Section 1022 amended 10 U.S.C. 8026 to require the Secretary of the Navy to ensure that the views of the Commandant of the Marine Corps are given appropriate consideration before a major decision is made by an element of the Department of the Navy outside the Marine Corps on a matter that directly concerns amphibious force structure and capability.
- Section 1023, as noted earlier, amends 10 U.S.C. 8062 to require the Navy to include not less than 31 operational larger amphibious ships, including 10 LHA/LHD-type ships and 21 LPD or LSD type ships.
- Section 1025 amends 10 U.S.C. 8695 to state that, in preparing a periodic battle force ship assessment and requirement, the Commandant of the Marine Corps shall be specifically responsible for developing the requirements relating to amphibious warfare ships.

## Medium Landing Ship (LSM) Program

### Overview

As noted earlier, the LSM program may include 18 to 35 ships. A total of 18 is mentioned in a July 2022 Navy document, *Chief of Operations Navigation Plan 2022*.<sup>18</sup> A total of 35 is mentioned regularly by Marine Corps officials, and would include nine operational LSMs for each of three envisioned Marine Littoral Regiments (MLRs),<sup>19</sup> plus eight additional LSMs to account for factors such as a certain number of LSMs being in maintenance at any given moment.<sup>20</sup> LSMs would be much smaller and individually much less expensive to procure and operate than the Navy's current amphibious ships.

### Procurement Schedule

The Navy wants to procure the first LSM in FY2025, the second in FY2026, the third and fourth in FY2027, and the fifth and sixth LSMs in FY2028.

On May 17, 2023, the Navy released a Request for Information (RFI) regarding the LSM program asking interested firms to reply to the following questions, among others: "Do you have the resources and production capacity available to be awarded four (4) [LSM] ships per fiscal year?... If so, how can your shipyard support production of 4 [LSM] hulls per year?... If not, what is the maximum number of [LSM] ships that can begin production each year?... If not, are there investment or shipyard improvements that can be done to enable increasing production capacity to 4 [LSM] hulls per year?"<sup>21</sup>

The Navy's FY2024 budget submission states that the contract for the construction of the first LSM would be awarded in March 2025, and that construction of the first LSM would begin in May 2026.

<sup>18</sup> U.S. Navy, "Chief of Operations Navigation Plan 2022," undated, released July 26, 2022, p. 10.

<sup>19</sup> For more on the MLRs, see CRS In Focus IF12200, *The U.S. Marine Corps Marine Littoral Regiment (MLR)*, by Andrew Feickert, *The U.S. Marine Corps Marine Littoral Regiment (MLR)*, by Andrew Feickert.

<sup>20</sup> See also Mallory Shelbourne, "Marine Corps, Navy Remain Split Over Design, Number of Future Light Amphibious Warship, Divide Risks Stalling Program," *USNI News*, September 14 (updated September 15), 2022.

<sup>21</sup> Naval Sea Systems Command (NAVSEA), *Medium Landing Ship (LSM) Request for Information (RFI)*, undated, attached to "Medium Landing Ship (LSM) Detail Design and Construction (DD&C) Request for Information (RFI)," SAM.gov, May 17, 2023, posted at <https://sam.gov/opp/20cdcdcb321b4f6e9571a3dc68e0b57c/view>. See also Rich Abott, "Navy Seeks Info From Potential LSM Amphib Builders, Wants Four Annually," *Defense Daily*, May 23, 2023.

## Procurement Cost

Under the Navy's FY2024 budget submission, the first LSM would be procured in FY2025 at a cost of \$187.9 million, the second LSM would be procured in FY2026 at a cost of \$149.2 million, the third and fourth LSMs would be procured in FY2027 at a combined cost of \$297.0 million (i.e., an average cost of about \$148.5 million each), and the fifth and sixth LSMs in FY2028 at a combined cost of \$296.2 million (i.e., an average of about \$148.1 million each). The first LSM would cost more than subsequent ships in the program because the procurement cost of the first LSM 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 FY2024 budget submission of about \$3.8 billion, and LPD-17 Flight II amphibious ships have unit procurement costs of about \$1.9 billion.

## 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).<sup>22</sup> DMO calls for U.S. naval forces (meaning the Navy and Marine Corps)<sup>23</sup> 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."<sup>24</sup> The use of Marine Corps units to contribute to U.S. sea-denial

<sup>22</sup> 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.

<sup>23</sup> 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.

<sup>24</sup> Emailed statement from Marine Corps as quoted in Shawn Snow, "New Marine Littoral Regiment, Designed to Fight (continued...)"

operations against an opposing navy by shooting ASCMs would represent a new mission for the Marine Corps.<sup>25</sup>

LSMs would be instrumental to these operations, with LSMs 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).”<sup>26</sup> 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<sup>27</sup> 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

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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.

<sup>25</sup> For press articles discussing these envisioned operations, see, for example, Jeff Schogol, “Inside the US Military’s Modern ‘Island Hopping’ Campaign to Take on China,” *Task and Purpose*, June 16, 2022; 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.

<sup>26</sup> 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.

<sup>27</sup> 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*.

- Sustain a combat-credible force ashore
- Conduct enduring operations
- Enable persistent joint-force operations and power projection
- Provide increased and capable forward presence<sup>28</sup>

The survivability of the LSMs 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).

As a key platform for implementing EABO, the LSM program forms a part of Force Design 2030, the Marine Corps' overall plan for plan for redesigning its units and equipment to meet future mission demands.<sup>29</sup>

## Ship Design

### *Design Features as Initially Conceived in 2020*<sup>30</sup>

As initially conceived in 2020, the Navy wanted LSMs to be a relatively simple and relatively inexpensive ships with the following features, among others:

- a length of 200 feet to 400 feet;<sup>31</sup>
- a maximum draft of 12 feet;
- a displacement of up to 4,000 tons;<sup>32</sup>
- a ship's crew of no more than 40 Navy sailors;<sup>33</sup>
- 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;<sup>34</sup>

<sup>28</sup> Department of the Navy, Headquarters, U.S. Marine Corps, *Tentative Manual for Expeditionary Advanced Base Operations*, February 2021, pp. 7-9 to 7-10.

<sup>29</sup> For more on Force Design 2030, see CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiative: Force Design 2030*, by Andrew Feickert.

<sup>30</sup> Unless otherwise stated, information in this section about the LSM is taken from Navy briefing slides and Navy answers to industry questions from LSM program industry days that were held on March 4 and April 9, 2020. For the March 4, 2020, briefing slides and associated Navy answers to industry question, see "RFI: US Navy Light Amphibious Warship (LAW)," Instant Markets, accessed April 13, 2023, at [https://www.instantmarkets.com/view/ID241536789711670668083773673995473423370/RFI\\_US\\_Navy\\_Light\\_Amphibious\\_Warship\\_LAW](https://www.instantmarkets.com/view/ID241536789711670668083773673995473423370/RFI_US_Navy_Light_Amphibious_Warship_LAW).

<sup>31</sup> Megan Eckstein, "Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

<sup>32</sup> Megan Eckstein, "Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept," *USNI News*, November 19, 2020.

<sup>33</sup> 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/c1c8a3900504442fa5ad3bac48cecc001/view?index=opp>.)

<sup>34</sup> Megan Eckstein, "Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept," *USNI News*, (continued...)

- 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;<sup>35</sup>
- 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;<sup>36</sup>
- a minimum unrefueled transit range of 3,500 nautical miles;<sup>37</sup>
- 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 LSM;<sup>38</sup>
- an ability to operate within fleet groups or deploy independently; and
- a 20-year expected service life.<sup>39</sup>

In addition to the above points, the Navy stated that the LSM’s design could 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 LSM is to have a displacement of up to 4,000 tons—about 1/10<sup>th</sup> or 1/11<sup>th</sup> the displacement of an LHA/LHD-type ship, and about 1/6<sup>th</sup> the displacement of an LPD-17 class ships.

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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>.)

<sup>35</sup> C4I is command and control, communications, computers, and intelligence.

<sup>36</sup> 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>.)

<sup>37</sup> 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, accessed November 23, 2020, at <https://beta.sam.gov/opp/c1c8a3900504442fa5ad3bac48cec001/view?index=opp>.)

<sup>38</sup> Megan Eckstein, “Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept,” *USNI News*, November 19, 2020.

<sup>39</sup> 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.



The above-listed 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's preference was that the ship's cargo space be in the form of open deck storage. Unlike most of the Navy's current amphibious ships, the LSM would not have a well deck.<sup>40</sup> The above-listed 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 would be a relatively fuel-efficient speed for moving ships through water,<sup>41</sup> which would permit the ship to be equipped with a less powerful and consequently less expensive propulsion plant. The above-listed 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 LSM'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).<sup>42</sup>

### ***Subsequent Navy-Marine Corps Discussion on LSM Design Features***

The Navy and Marine Corps reportedly have been discussing and debating some of LSM's design features, with a key issue being the amount of combat survivability to be incorporated into the LSM's design, and the impact this would have on the LSM's unit procurement cost.

A September 14, 2022, press report stated

The Marine Corps and Navy remain at an impasse over the future of the Light Amphibious Warship, as skepticism about the program's viability mounts due to the internal division, sources familiar with the program have told USNI News....

The division between the two services largely comes down to survivability, or what types of weapons and armors to place on a ship that would operate in the first island chain,<sup>43</sup> within range of Chinese missiles.

Adding more weapons and armor to LAW makes the ship more expensive. Projections in 2020 called for each LAW to cost \$100 million, a number described as unrealistic by the person familiar with program discussions. Now the Marine Corps wants the ship to cost around \$150 million apiece so it can buy more of them, while the Navy is pushing for a more survivable ship that would end up costing about \$300 million each.<sup>44</sup>

An October 5, 2022, press report states

The U.S. Navy and Marine Corps, facing a decision point early next year on the light amphibious warship, are working to balance the Corps' focus on affordability with the Navy's push for survivability.

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<sup>40</sup> As noted in footnote 4, 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.

<sup>41</sup> 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.

<sup>42</sup> 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.

<sup>43</sup> The term *first island chain* refers to the large and small islands that together enclose China's near-seas region, including the Yellow Sea, East China Sea, and South China Sea. For a map showing the first island chain, see Department of Defense, *Military and Security Developments Involving the People's Republic of China 2022, Annual Report to Congress*, released on November 29, 2022, p. 67.

<sup>44</sup> Mallory Shelbourne, "Marine Corps, Navy Remain Split Over Design, Number of Future Light Amphibious Warship, Divide Risks Stalling Program," *USNI News*, September 14 (updated September 15), 2022.

Lt. Gen. Karsten Heckl, the deputy commandant for combat development and integration, told Defense News the two services are emerging from an initial disagreement about the cost and capabilities of this new platform.

The Marine Corps, since the early days of the light amphibious warship program, has aimed for a price of \$100 million to \$130 million a copy. But the Navy—whose sailors would drive and maintain the ship—and the Office of the Secretary of Defense wanted much greater protection for the personnel onboard, tripling the cost and leading the Navy to plan to buy just 18 instead of the Marines’ stated objective of 35.

“What should be a \$120-\$130 million ship should not be north of \$350 million a copy,” Heckl said.

Though the platforms will have to be tougher than a commercial vessel, Heckl said the light amphib is meant to appear like a commercial craft—to “hide in plain sight.”

“The [Indo-Pacific] sea lines of communication are the most traversed sea lines in the world; it would be a challenge for any power to surveil everything all the time in that area,” he said. “However, if you don’t look like everything else you’re trying to blend in with, you make your adversary’s problem set much simpler.”

The Marines don’t envision using this vessel during combat operations either, the general said.

If there are indications a conflict may break out, the combatant commander would order the light amphibious warships, or LAW, to quickly relocate Marines or resupply units, “and then it goes into hiding, it goes into bed-down somewhere. Nowhere do we envision the LAW out transiting the sea lanes in the middle of a kinetic fight.”

After several meetings between Heckl’s team and the Navy’s Program Executive Office for Ships and the assistant secretary for research, development and acquisition, Heckl said the group agreed “there is a lot of maneuver space” to come to an agreement and keep the program on track for its planned fiscal 2025 start of construction.

Five companies are working on preliminary designs following a June 2021 contract award, and the Navy-Marine team will review those designs in January, Heckl said. At that point, with industry input in hand and an agreement in place over the right balance of survivability versus cost, he said the team will be in a better place to decide what that balance of survivability and affordability looks like and which companies are equipped to build that vessel....

[Lt. Gen. David Furness, the deputy commandant for plans, policies and operations] said the way the light amphibious warships operate would mitigate the risk China defeats them. These ships would operate in and around the 7,000 islands of the Philippines, for example, blending in with local commercial craft and not likely to become a target for Chinese precision missiles.

Heckl acknowledged the ships might be operating within the range of Chinese anti-ship missiles, but said the military too often focuses “on worst-case scenario, which drives us into situations where the force becomes just simply unaffordable and unattainable.”<sup>45</sup>

A February 17, 2023, press report stated:

A top Marine Corps official here this week dismissed concerns the services new Medium Landing Ships (LSM), formerly called the Light Amphibious Warship (LAW), are not survivable enough, arguing there is always a balance.

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<sup>45</sup> Megan Eckstein, “Marines, Navy Near Agreement on Light Amphibious Warship Features,” *Navy Times*, October 5, 2022.

“Survivability is a discussion that I have all the time. Survivability is not binary. It’s not black or white, yes or no, zero or one. Things are made more survivable when you add resources to make their movements more secure. Nothing in and of itself is ‘survivable,’” Gen. Eric Smith, Assistant Commandant of the Marine Corps (ACMC), said here Wednesday [February 15] during the annual WEST conference, sponsored by AFCEA International and the U.S. Naval Institute.<sup>46</sup>

A February 24, 2023, press report stated:

Several Navy officials recently confirmed the Navy and Marine Corps compromised on designs for the new Landing Ship Medium (LSM) and laid out the upcoming schedule, but also said it will be a warship that goes into contested environments....

“That has been resolved...but in general, it’s like a marriage, compromise is important. And I will say that in the end everybody lined up on the requirements,” Tom Rivers, executive director at program executive office, ships, said during the National Defense Industrial Association’s (NDIA) annual Expeditionary Warfare Conference on Feb. 23.

Angela Bonner, deputy program manager of the Amphibious Assault and Connectors program office, PMS-317, said that over the last year the two services agreed on the requirements for LSM and the Navy completed preliminary design.<sup>47</sup>

A February 28, 2023, press report stated:

The Marine Corps will experiment on the commercial ship it leased to help decide what capabilities its planned medium landing ships will require, officials said.

The Marine Corps Warfighting Lab plans to lease a total of three Stern Landing Vessels, or SLVs. The first has been heavily modified and is expected to arrive in San Diego for testing and evaluation in late March or early April. The other two are likely to be leased next year, and may sport different modifications. After the experiments, they will become part of a “bridging solution” for shore-to-shore operations.<sup>48</sup>

An April 4, 2023, press report states:

The U.S. Navy and Marine Corps are nearing agreement on the requirements and cost of the Landing Ship Medium program, formerly called the Light Amphibious Warship, after the services previously diverged in their visions for this program, officials said.

The capability development document for the program has been drafted and is working its way through the approval process now, Brig. Gen. Marcus Annibale, the director of expeditionary warfare on the chief of naval operations’ staff, said Tuesday [April 4] at the Navy League’s annual Sea Air Space conference....

Vice Adm. Scott Conn, the deputy chief of naval operations for warfighting requirements and capabilities, said during the same panel discussion that there had been a “healthy friction” over the requirements and cost of the ship but that “there is no daylight between us” on the importance of getting this small ship out to the fleet.

Lt. Gen. Karsten Heckl, the deputy commandant of the Marine Corps for combat development and integration, said during the panel discussion that his office, working with

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<sup>46</sup> Rich Abott, “Marine Official Dismisses Medium Amphib Survivability Concerns,” *Defense Daily*, February 17, 2023.

<sup>47</sup> Rich Abott, “Navy And Marine Corps Compromised On Medium Amphibs Requirements And Will Go Into Contested Environments, Officials Say,” *Defense Daily*, February 24, 2023.

<sup>48</sup> Jennifer Hlad, “Leased Ship Will Shape USMC Amphib Requirements,” *Defense One*, February 28, 2023. See also Mallory Shelbourne, “Marines to Test Prototype Landing Ship to Support New Force Design,” *USNI News*, February 27 (updated March 1), 2023; Jennifer Hlad and Lauren C. Williams, “Marines to Begin Testing Leased Vessel for Pier-less Operations,” *Defense One*, February 22, 2023.



Conn's and Annibale's teams and the Program Executive Office for Ships, "found some pretty good middle ground on recoverability and vulnerability additions we're going to put into the medium landing ship, LSM, that I think are going to be very helpful."

"A very large part of the concept initially was, low cost, large numbers, hide in plain sight. We did not want to look like a military vessel. We're talking about the most traversed maritime lanes in the world; we needed to look and sound like other vessels, to make it a little more difficult" for China or other adversaries to detect Marines on these ships.

Though the discussions with the Navy and the Office of the Secretary of Defense had previously led to much greater requirements for capability and survivability, and therefore much greater cost, "we're coming back around to the size and correspondently the cost ... where we initially had our sights," Heckl said...

Annibale said PEO Ships commander Rear Adm. Tom Anderson will host an industry engagement day after the capability development document is signed. He hopes this will be a chance for the Navy and Marines to explain what they want to do with this ship and why, which may inspire better ideas from engineers than will the thick stack of paper outlining the formal requirements.<sup>49</sup>

### *Navy Notional LSM Design Concept*

**Figure 1** and **Figure 2** show a Navy notional LSM design concept. The LSM design eventually selected for procurement could differ from this notional concept.

### **Potential Builders**

The LSM 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 LSM program, but the Navy is open to having LSMs built in multiple yards to the same design if doing so could permit the program to be implemented more quickly and/or less expensively.<sup>50</sup> As noted

<sup>49</sup> Megan Eckstein, "Landing Ship Medium Requirements in Final Approvals with Navy, Marines," *Defense News*, April 4, 2023.

<sup>50</sup> The Q&A document from the Navy's April 9, 2020, industry day on the LAW program (see footnote 30) 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.

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.

earlier, the Navy's FY2024 budget submission states that the contract for the construction of the first LSM would be awarded in March 2025.

**Figure 1. Navy Notional LSM Design Concept**

Computer rendering



**Source:** Cropped version of screenshot at 5:08 from “Marine Corps Ship Requirements | Does the Marine Corps Have Ships?” Video posted by Combat Development & Integration on February 14, 2023, at <https://www.youtube.com/watch?v=adllHQqLU-c>.

***Reported July 2020 Contract Awards***

An October 6, 2020, press report stated that the Navy in July 2020 awarded contracts for LSM 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 LSM program, in support of a planned lead-ship contract award in FY2022.

**Figure 2. Navy Notional LSM Design Concept**

Cutaway computer rendering



**Source:** Image from cover slide from U.S. Navy briefing on LSM program for CRS and Congressional Budget Office (CBO), May 22, 2023, used here with the permission of the Navy briefers.

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 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.<sup>51</sup>

### ***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.<sup>52</sup>

<sup>51</sup> 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 Abbott, "Marine Corps In Industry Studies For Light Amphibious Warship, Trying To Move Quickly," *Defense Daily*, August 28, 2020.

<sup>52</sup> 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 Abbott, "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 LSM industry studies, the Navy had received nine LSM 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.<sup>53</sup> 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.”<sup>54</sup>

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.”<sup>55</sup>

<sup>53</sup> Aidan Quigley, “Nine Concept Designs Submitted for LAW Industry Studies,” *Inside Defense*, November 9, 2020.

<sup>54</sup> Megan Eckstein, “Navy Officials Reveal Details of New \$100M Light Amphibious Warship Concept,” *USNI News*, November 19, 2020.

<sup>55</sup> 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.<sup>56</sup>

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.<sup>57</sup>

## **FY2024 Funding Request**

The Navy’s proposed FY2024 budget requests \$14.7 million in research and development funding for the program. The funding is requested in Project 4044 (Medium Landing Ship) of PE (Program Element) 0603564N (Ship Preliminary Design and Feasibility Studies), which is line 46 in the Navy’s FY2024 research and development account.

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<sup>56</sup> Mallory Shelbourne, “Navy Awards 5 Companies Light Amphibious Warship ‘Concept Design’ Contracts,” *USNI News*, June 17, 2021.

<sup>57</sup> 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 LSM program poses a number of potential oversight matters for Congress, including those discussed briefly in the sections below.

### Analysis of Alternatives (AOA)

One issue for Congress concerns the analysis of alternatives (AOA) for the LSM program. An AOA is a formal study that examines broad options for meeting a mission requirement, determines whether that requirement would be best met through the procurement of a new weapon system or platform (e.g., ship or aircraft), and if so, what that general features of that new weapon system or platform should be. A June 2022 Government Accountability Office (GAO) report assessing selected DOD weapon acquisition programs stated the following in its entry on the LSM program:

The Navy plans to approve an analysis of alternatives—a key document that will help Navy leadership decide whether a new ship class is necessary to meet mission needs—in support of the program in early 2022. Nonetheless, the Navy is already in the process of defining requirements for LAW and starting ship design efforts. Our prior work shows that moving forward before Navy leadership validates the need for a new ship class can increase the risk of acquiring ships that do not cost-effectively meet mission needs....

The [LSM] program office stated that the Navy is reviewing the analysis of alternatives report in advance of a meeting to decide whether it will approve the analysis of alternatives results. It added that moving forward with defining requirements through studies and collaboration with industry on preliminary design concepts are common Navy best practices being used to ensure LAW delivers the capability needed to support the Marine Littoral Regiments.<sup>58</sup>

### 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 LSMs. As noted earlier, the issue of the future amphibious ship force level goal reportedly has been a matter of debate within the Defense Department.<sup>59</sup> A related potential oversight issue for Congress concerns how the LSM would fit into the Navy's overall future fleet architecture. Potential oversight questions for Congress include the following:

- What is the analytical basis for the envisioned procurement quantity of 18 to 35 LSMs?<sup>60</sup>
- How well can the cost-effectiveness of a force of 18 to 35 LSMs be assessed if the remainder of the Navy's amphibious ship fleet architecture is not yet fully known?

<sup>58</sup> Government Accountability Office, *Weapon Systems Annual Assessment[:] Challenges to Fielding Capabilities Faster Persist*, GAO-22-105230, June 2022, p. 194.

<sup>59</sup> See Megan Eckstein, "White House Steps in as Navy, Pentagon Feud over Amphibious Ship Study," *Defense News*, December 8, 2022. See also Justin Katz, "Del Toro: Navy-Marine Corps Amphib Study in 'Final Stages,' Being Briefed to Leadership," *Breaking Defense*, December 6, 2022; Lee Hudson, "Senators Press Del Toro for Update on Amphib Study," *Politico Pro*, November 14, 2022.

<sup>60</sup> 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.



A February 16, 2023, press report stated:

The Marine Corps' latest requirements call for nine smaller amphibious ships per regiment to shuttle Marines and equipment between islands and shorelines, service officials said today.

The service has said for months that it needs 35 Landing Ship Mediums—previously known as the Light Amphibious Warship—for the type of operations it envisions in the Indo-Pacific region. The idea is that the three Marine Littoral Regiments operating in the Indo-Pacific would each have nine LSMs, while leaving room for eight ships that would inevitably get tied up in maintenance periods, according to a new Marine Corps video about requirements.

The Marine Corps came up with this requirement after modeling and simulations, deputy commandant for combat development and integration Lt. Gen. Karsten Heckl said Tuesday [February 14] at the WEST 2023 conference, co-hosted by the U.S. Naval Institute and AFCEA.

"It doesn't necessarily need to be a Marine Littoral Regiment," he said. "So the square footage, the cargo—and that's where we came up with the requirements—berthing, fuel, all of it," Heckl said.

The requirements focused on tonnage, square footage for cargo and the need for Marines to move around the region on their own, without the benefit of long runways or ports and piers....

While the Marine Corps says it needs 35 LSMs, Chief of Naval Operations Adm. Mike Gilday's navigation plan called for 18 LAWs, the previous name for the program. Asked about that difference, Heckl said he and deputy chief of naval operations for warfighting requirements and capabilities (OPNAV N9) Vice Adm. Scott Conn crafted requirement language that says the ultimate requirement is 35, but "the initial operational inventory will be 18."<sup>61</sup>

A January 17, 2023, press report stated:

The Navy is planning to secure a plan to procure 18 Light Amphibious Warship (LAW) in the department's 2025 budget planning process, a top Navy official said last week during the Surface Navy Association's annual symposium on Jan. 11

During a panel discussion, Marine Brig. Gen. Marcus Annibale, director of expeditionary warfare (OPNAV N95), reiterated the Chief of Naval Operations NAVPLAN set a goal of 18 LAWs that the service intends to "lock in" in the Defense Department's Program Objective Memorandum [POM] [for the fiscal year] 2025 [budget submission].<sup>62</sup>

The issue of the future amphibious ship force-level goal is discussed further in the CRS report on the Navy's LPD-17 Flight II and LHA-class amphibious shipbuilding programs.<sup>63</sup>

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<sup>61</sup> Mallory Shelbourne, "Marine Corps Requirements Call for 9 Light Amphibious Ships per Regiment," *USNI News*, February 14 (updated March 1), 2023. See also Rich Abott, "Marine Corps' 35-Ship Medium Amphib Requirement Means Nine Per Regiment, Based On Space Needs," *Defense Daily*, February 16, 2023.

<sup>62</sup> Rich Abott, "Navy Planning To Procure 18 LAWs in FY 2025 Plans," *Defense Daily*, January 17, 2023.

<sup>63</sup> CRS Report R43543, *Navy LPD-17 Flight II and LHA Amphibious Ship Programs: Background and Issues for Congress*, by Ronald O'Rourke.

## Force Design 2030 and EABO Operational Concept

Another potential oversight issue for Congress concerns the merits of Force Design 2030 and the EABO operational concept that the LSM is intended to help implement. Debate on the merits of Force Design 2030 and the EABO concept has been vigorous and concerns issues such as

- whether Force Design 2030 and the EABO concept are 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;
- the survivability of Marine forces on the islands and in surrounding waters;
- 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.<sup>64</sup>

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 LSM. 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 LSM program proceeds, will the operational requirements (and thus procurement cost) of the LSM increase?

## Potential Alternative of Adapting Existing Army LSVs

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

<sup>64</sup> For a CRS report on Force Design 2030, see CRS Insight IN11281, *New U.S. Marine Corps Force Design Initiative: Force Design 2030*, by Andrew Feickert. See also CRS In Focus IF12200, *The U.S. Marine Corps Marine Littoral Regiment (MLR)*, by Andrew Feickert, *The U.S. Marine Corps Marine Littoral Regiment (MLR)*, by Andrew Feickert. For examples of press reports published since April 2021 discussing the merits of Force Design 2030 and the EABO concept, see the **Appendix**.



effectively by transferring existing Army watercraft known as Logistics Support Vessels (LSVs) (Figure 3) to the Navy and adapting these LSVs to the LSM mission.

**Figure 3. 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.<sup>65</sup>

In a May 2022 update to its Force Design 2030 plan, the Marine Corps stated that it would "Provide and sustain bridging solutions for littoral mobility for MLR experimentation and training until the LAW is fielded," and that

While we await the delivery of LSM, which post-dates the planned operational readiness of our MLRs, we will explore a family of systems bridging plan—including, Expeditionary Transfer Dock (ESB), Expeditionary Fast Transport (T-EPF), Landing Craft Utility (LCU), and leased hulls—that can provide a basic level of mobility. Although not optimal, such vessels will provide both operational capability and a sound basis for live experimentation and refining detailed requirements for the LSM program.<sup>66</sup>

In June 2022, the Marine Corps stated that pending the delivery of the first LSMs, it will likely use three civilian stern landing vessels to inform the design of the LSM hull form and experiment with and confirm operational concepts for the LSM program.<sup>67</sup>

Potential questions for Congress include the following:

<sup>65</sup> 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; Chris Bernotavicius, Michelle Macander, Danielle Ngo, and John Schaus, "You Go to War with the Watercraft You Have," *War on the Rocks*, July 26, 2022.

<sup>66</sup> U.S. Marine Corps, *Force Design 2030, Annual Update*, May 2022, pp. 8 and 15. See also Megan Eckstein, "The Light Amphibious Warship Is Delayed, but the Marine Corps Has a Temporary Solution," *Defense News*, May 10, 2022; Mallory Shelbourne, "Marines Look to EPFs, ESBs as Interim Solution for Light Amphibious Warship," *USNI News*, May 10 (updated May 11), 2022.

<sup>67</sup> Audrey Decker, "Smith: Marine Corps Likely to Contract Three Stern Landing Vessels," *Inside Defense*, June 16, 2022.

- How many of these watercraft would be available for transfer to the Navy for use in meeting the operational requirements of the LSM program?
- How do the capabilities of these watercraft compare with those required for the LSM?
- 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 LSM program's operational requirements could transferred watercraft meet? How many LSMs, if any, would still need to be built to fully or substantially meet the LSM 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 LSMs 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 LSM program's requirements through the acquisition of 24 to 35 new LSMs?
- What would be the potential industrial-base implications of using transferred watercraft to meet at least some portion of the LSM program's operational needs?

## Industrial-Base Implications

Another potential oversight issue for Congress concerns the potential industrial-base implications of the LSM 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, LSMs could be built by multiple U.S. shipyards.<sup>68</sup> Potential oversight questions for Congress include the following:

- What implications might the LSM program have for the distribution of Navy shipbuilding work among U.S. shipyards?
- How many jobs would the LSM 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 LSMs 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?<sup>69</sup>

<sup>68</sup> 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...."

<sup>69</sup> 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.

## Legislative Activity for FY2024

### Summary of Congressional Action on FY2024 Funding Request

**Table 1** summarizes congressional action on the FY2024 procurement funding request for the LSM program.

**Table 1. Congressional Action on FY2024 Procurement Funding Request**

Millions of dollars, rounded to nearest tenth

Request	Authorization			Appropriation		
	HASC	SASC	Final	HAC	SAC	Final
Research and development						

**Source:** Table prepared by CRS based on Navy's FY2024 budget submission, committee and conference reports, and explanatory statements on FY2024 National Defense Authorization Act and FY2024 DOD Appropriations Act. The funding is requested in Project 4044 (Medium Landing Ship) of PE (Program Element) 0603564N (Ship Preliminary Design and Feasibility Studies), which is line 46 in the Navy's FY2024 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.

## Appendix. Press Reports Regarding Debate on Merits of Force Design 2030 and EABO

This appendix presents examples of press reports published since April 2021 discussing the merits of Force Design 2030 and the EABO concept, starting with the most recent on top.

Robert Work, “Marine Force Design: Changes Overdue Despite Critics’ Claims,” *Texas National Security Review*, Summer 2023.

Christopher Owens, “The Radical Redesign and Restructuring of the United States Marine Corps,” *Real Clear Defense*, May 13, 2023.

Christopher Owens, “Congress Must Restore Order to the Navy’s Amphibious Ship Program,” *Defense News*, February 6, 2023.

Bryan McGrath, “The Navy Put Its Next Amphib on Hold. Good,” *Defense One*, January 20, 2023.

Martin Steele, “A better plan for the Marine Corps and the nation: Vision 2035,” *Marine Corps Times*, January 4, 2023.

J. Noel Williams, “What Force Design 2030 Really Does,” *U.S. Naval Institute Proceedings*, January 2023.

Justin Katz, “The Year the Marine Corps’ Force Design 2030 Came into Its Own: 2022 in Review,” *Breaking Defense*, December 22, 2022.

Terrence R. Dake and Charles E. Wilhelm, “Reduce the Risk to National Security: Abandon ‘Force Design 2030,’” *The Hill*, December 21, 2022.

Paul Van Riper, “This Is the Marine Corps Debate We Should Be Having,” *Marine Corps Times*, December 7, 2022.

Harry W. Jenkins, “The Ugly Truth: Can the Light Amphibious Warship Survive War with China?” *The Hill*, November 2, 2022.

Dakota Wood, “The U.S. Marine Corps Has a Choice: Transform or Die,” *Defense One*, October 16, 2022.

Stephen Baird and Timothy Wells, “Why Marine Corps Forces Are Becoming Less Relevant to Combatant Commanders,” *The Hill*, October 13, 2022.

Paula Thornhill, “Civilians Will Choose the Marine Corps’ Future—and Soon, And They Will Do It by Selecting the Next Commandant and Other Four- And Three-Star Generals,” *Defense One*, October 13, 2022.

Gary Anderson, “Can Congress Save the Marine Corps from Itself?” *Military.com*, October 5, 2022;.

John Sattely and Jason A. Paredes, “Sustainment of the Stand-In Force,” *War on the Rocks*, September 12, 2022.

Jonathan Lehrfeld, “Former Marine Officials, Experts Praise Force Design 2030,” *Defense News*, August 26, 2022.

Gary Anderson, “Creating a Real Deterrent to Defend Taiwan,” *Military.com*, August 25, 2022.

James A. Warren, “If the Marine Corps Isn’t Broken—and It Isn’t—Why Fix It?” *Daily Beast*, August 20 (updated August 21), 2022.

Richard R. Burgess, “Navy’s Light Amphibious Warship Will Be A ‘Great Enabler’ for Marine Littoral Regiments, General Says,” *Seapower*, August 19, 2022.

Franz J. Gayl, “The Marine Corps’ New Plan Will Not Beat China in a Fight for Taiwan,” *Marine Corps Times*, August 4, 2022.

Gary “GI” Wilson, William A. Woods, and Michael D. Wyly, “Send in the Marines? Reconsider Force Design 2030 Beforehand,” *Defense News*, August 4, 2022.

Michelle Macander Grace Hwang, “Marine Corps Force Design 2030: Examining the Capabilities and Critiques,” Center for Strategic and International Studies (CSIS), July 22, 2022.

Max Boot, “The Top Marine Faces Unprecedented Opposition. He Says That’s ‘Positive.’” *Washington Post*, July 20, 2022.

Scott Cuomo, “On-the-Ground Truth and Force Design 2030 Reconciliation: A Way Forward,” *War on the Rocks*, July 12, 2022.

John F. Schmitt, “The Marine Corps’ Latest Idea for Countering China Has Major Problems,” *Task and Purpose*, July 7, 2022.

Mark Cancian, “Analyzing the Biggest Changes in the Marine Corps Force Design 2030 Update,” *Breaking Defense*, June 14, 2022.

Worth Parker, “How the Marine Corps Went to War with Itself over the Next War,” *Task and Purpose*, June 10, 2022.

Jesse Schmitt, “When Only a Chisel Will Do: Marine Corps Force Design for the Modern Era,” *Center for International Maritime Security (CIMSEC)*, June 2, 2022.

Stuart Scheller, “The Marine Corps’ Debate with Its Generals Is Amusing, but Dangerous,” *Marine Corps Times*, June 1, 2022.

Brent Stricker, “Marine Corps Metamorphosis: Legal Considerations,” *Center for International Maritime Security (CIMSEC)*, May 31, 2022.

Charles C. Krulak, “Whose Marine Corps? Why a Force Design Battle Is Losing Sight of the Basics,” *Marine Corps Times*, May 27, 2022.

Owen West, “Are the Marines Inventing the Edsel or the Mustang?” *War on the Rocks*, May 27, 2022.

David E. Johnson, “Ending the Civil War over the Future of the US Marine Corps,” *Breaking Defense*, May 24, 2022.

Elliot Ackerman, “A Whole Age of Warfare Sank With the Moskva, A Fierce Debate Is Raging within the U.S. Marine Corps about What Comes Next.” *Atlantic*, May 22, 2022.

CDR Salamander, “Force Design 2030: Futurism, Imbroglia, or Creative Friction?” *CDR Salamander*, May 17, 2022.

Todd South, “Lethal and Survivable or Irrelevant and Vulnerable? Marine Redesign Debate Rages,” *Marine Corps Times*, May 16, 2022.

Robert Work, “USMC Force Design 2030: Threat Or Opportunity?” *19FortyFive*, May 15, 2022.

Tom Hanson, “Rather Than Wreck It, Berger’s Vision Will Save the Marine Corps from Itself,” *Marine Corps Times*, May 10, 2022.



John Vandiver, “Marines Unveil Force Structure Update amid Opposition from Retired Generals about Service’s Direction,” *Stars and Stripes*, May 10, 2022.

Will McGee, “Forcing Design or Designing Force? The Reinvention of the Marine Corps,” *Small Wars Journal*, May 7, 2022.

Howard Altman, “Marines Based Inside China’s Striking Distance Key To Deterrence General Says,” *The Drive*, May 5, 2022.

Audrey Decker, “Heckl: Force Design 2030 Will Make It ‘Damn Hard’ for China to Make a Move,” *Inside Defense*, May 4, 2022.

Mallory Shelbourne, “Marines Committed to New Force Design, Despite Criticism From Retired Generals,” *USNI News*, May 4, 2022.

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.

P. K. Van Riper, “The Marine Corps’ Plan to Redesign the Force Will Only End Up Breaking It,” *Task and Purpose*, April 20, 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.

John M. Doyle, “Navy, Marine Corps Labs Exploring How to Keep Advanced Bases Supplied and Safe,” *Seapower*, February 10, 2022.

John M. Doyle, “Berger Says Supporting a Widely Distributed Maritime Force Will Be a Challenge,” *Seapower*, May 14, 2021.

Yasmin Tadjdeh, “Light Amphibious Warships Face Survivability Questions,” *National Defense*, April 23, 2021.

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