

# U.S. Navy

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The President's fiscal year (FY) 2021 budget request seeks nearly \$160 billion for the U.S. Navy. This budget request seeks a balance of readiness, lethality, and capacity to provide a Navy that is "ready to fight today" while investing in the means to win future wars.<sup>1</sup> At the same time, working in concert with the other services and under the leadership of U.S. Indo-Pacific Command (INDOPACOM), the Navy is the primary military component of our government's efforts to ensure "a free and open Indo-Pacific," by which is meant an Indo-Pacific that is "free from coercion by other nations" and free to choose trading partners and exercise sovereignty.<sup>2</sup>

The demands of being a force in readiness for combat while also competing in the day-to-day great-power competition with Russia and China are placing increasing strain on the fleet. In 2000, the Navy had 318 battle force ships, and today, despite growing maritime challenges, it must meet its operational obligations with only 300. Yet the average number of ships underway since 2000 has "remained roughly constant."<sup>3</sup> Confronting persistent and increasingly dire maritime challenges while recovering from a series of fatal collisions in 2017 and overcoming institutional confusion caused by highly visible leadership changes, the Navy is at an inflection point.

**Strategic Framework.** The Navy, Marine Corps, and Coast Guard (known collectively as the sea services) have enabled the U.S. to project power across the oceans, controlling activities on the seas when and where needed.

However, competitors increasingly contest U.S. maritime presence, stressing the ability of the current fleet to execute national missions and causing allies and potential security partners around the world to question the nation's reliability.

As the U.S. military's primary maritime arm, the Navy provides enduring forward global presence that enables the U.S. to respond quickly to global crises. As a result, naval forces are often the first responders, preserving and safeguarding U.S. security interests. To this end, the Navy's strategic approach has been to focus its investments in several functional areas: power projection, control of the seas, maritime security, strategic deterrence, and domain access. This approach is informed by several key documents:

- The 2017 National Security Strategy;<sup>4</sup>
- The 2018 National Defense Strategy (NDS);<sup>5</sup>
- The Global Force Management Allocation Plan (GFMAP);<sup>6</sup> and
- The Chief of Naval Operations (CNO) December 2019 Fragmentary Order.<sup>7</sup>

Significantly, the 2018 NDS directs the building of a more lethal, resilient, and agile force to deter and defeat aggression by great-power competitors across the spectrum of military operations. In recent years, this

TABLE 4

## Navy Force Structure Assessment

| Ship Type/Class              | Current Fleet | 2016 Force Structure Assessment | Index Recommendation* |
|------------------------------|---------------|---------------------------------|-----------------------|
| Ballistic Missile Submarines | 14            | 12                              | 12                    |
| Aircraft Carriers            | 11            | 12                              | 13                    |
| Large Surface Combatants     | 91            | 104                             | 105                   |
| Small Surface Combatants     | 32            | 52                              | 71                    |
| Attack Submarines            | 52            | 66                              | 65                    |
| Guided Missile Submarines    | 4             | 0                               | 0                     |
| Amphibious Warships          | 33            | 38                              | 45                    |
| Combat Logistics Force       | 30            | 32                              | 54                    |
| Command and Support          | 32            | 39                              | 35                    |
| <b>Total</b>                 | <b>299</b>    | <b>355</b>                      | <b>400</b>            |

\* The recommendation for a 400-ship navy comes from Thomas Callender, "The Nation Needs a 400-Ship Navy," Heritage Foundation *Special Report* No. 205, October 26, 2018, <https://www.heritage.org/defense/report/the-nation-needs-400-ship-navy>.

**SOURCE:** Naval Sea Systems Command, Naval Vessel Register, "Fleet Size," <http://www.nvr.navy.mil/NVRSHIPS/FLEETSIZES.HTML> (accessed August 19, 2020).

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requirement has necessitated a shift to an emphasis on forward presence that ensures the Navy's positional advantage to execute sea control and denial of key maritime theaters.<sup>8</sup> The GFMAP specifies the global forward force presence to meet the challenges posed by our competitors.

Shortly after assuming his responsibilities as CNO, Admiral Michael M. Gilday issued a fragmentary order (FRAGO) updating the current Navy strategy. This update does not diverge from the previous Navy strategy, which focused on implementing the National Defense Strategy by supporting investments in readiness, capability, and capacity.<sup>9</sup> Typically, a FRAGO is a temporary update before a fuller revision is released.<sup>10</sup> That said, the Navy's goal remains being "ready to fight and win."<sup>11</sup>

However, competitors like China and Russia have studied how the U.S. military operates

and have developed capabilities and implemented concepts of operations that challenge our Navy below the level of armed conflict. Too often, the fact that the U.S. does not have an effective response enables a competitor to achieve its objective, thus undermining the rules-based status quo. For the past several years, acknowledging today's reality and closing this strategic and tactical seam has been a focus of what INDOPACOM Commander Admiral Philip S. Davidson calls "win before fighting."<sup>12</sup> The Navy's effectiveness in this "gray zone" can contribute significantly to a free and open Indo-Pacific against malign actors that seek political objectives without firing a shot.

With this in mind, attempts to measure the capacity, capability, and readiness of the Navy increasingly must take into account metrics beyond conventional warfighting and include operational effectiveness across the spectrum

of day-to-day competition with China and Russia. For the Navy, however, conventional warfighting remains the principal factor informing its size, set of capabilities, and operational readiness. This *Index* therefore focuses on these elements as the primary criteria by which to measure U.S. naval strength:

- Sufficient **capacity** to defeat adversaries in major combat operations and provide a credible peacetime forward presence to maintain freedom of shipping lanes and deter aggression;
- Sufficient technical **capability** to sustain America's advantage against potential adversaries; and
- Sufficient **readiness** to ensure that the fleet can “fight tonight” given proper material maintenance, personnel training, and physical well-being.

**Concepts of Operations.** Under increasing threat from anti-ship ballistic missiles, cruise missiles, and submarines, the fleet has worked to develop countermeasures to include new concepts of operations.<sup>13</sup> As field testing of these concepts begins, the experience gained will significantly inform future force structure and likely be a key element in the forthcoming Integrated Naval Force Structure Assessment (INFSA) expected in the fall of 2020.

## Capacity

**Force Structure.** The Navy measures capacity by the size of its battle force, which is composed of ships it considers directly connected to combat missions.<sup>14</sup> This *Index* continues the 2020 *Index*'s budget-agnostic benchmark of 400 ships for the minimum manned battle force fleet. A fleet of this size is better able to maintain a global forward presence to deter potential aggressors while assuring allies and attracting maritime partners. To this end, the *Index* uses the fleet size required to handle two major wars or major regional contingencies (MRCs) simultaneously or in closely

overlapping time frames as the benchmark against which to measure service capacity.

An accurate assessment of the Navy's capacity takes into account both presence and deterrence. A 400-ship fleet can provide:

- 13 Carrier Strike Groups (CSG), with 11 operationally available and 20 percent as a strategic reserve;
- 13 carrier air wings, with a minimum of 624 strike fighter aircraft,<sup>15</sup>
- 15 Expeditionary Strike Groups (ESGs), requiring 38 amphibious warfare vessels under the two-MRC construct, to ensure the ability to execute two Marine Expeditionary Brigade (MEB)-level operations simultaneously,<sup>16</sup>
- The historical steady-state demand of approximately 100 ships constantly forward deployed in key regions around the world; and
- Sufficient capacity to maintain the Navy's ships properly and ensure that its sailors are adequately trained to “fight tonight.”<sup>17</sup>

This benchmark represents a significant increase from the FY 2018 National Defense Authorization Act (NDAA), which specified a battle force fleet of 355 ships,<sup>18</sup> and the Navy's own 2016 Force Structure Assessment (FSA).<sup>19</sup> It is worth noting that the 2016 FSA also concluded that a 653-ship force would be necessary to address all of the demands registered in the FY 2017 Global Force Management (GFM) request but deemed this to be unrealistic given resource constraints.<sup>20</sup> Given such a large disparity and demands levied by the 2018 National Defense Strategy, the Navy's leadership has indicated that the next FSA (the INFSA) will address the force-level requirements of supporting concepts such as Marine Expeditionary Advance Base Operations (EABO).<sup>21</sup>

The need to meet growing national security needs while remaining in budget is forcing the

Navy to rethink force structure. To this end, according to Acting Secretary of the Navy Thomas Modly, CNO Gilday, and Marine Corps Commandant General David Berger, the Navy will have to incorporate more unmanned vessels and larger numbers of smaller vessels.<sup>22</sup>

While the 2020 INFSA has yet to be released, public statements from the Navy's leadership and evolving concepts of operations make it increasingly clear the Navy's future battle force will be composed of a mixture of manned and unmanned ships for a combined total of approximately 435 warships.<sup>23</sup> Given the Navy's continuing fleet readiness demands and the NDS's focus on the "reemergence of long-term strategic competition,"<sup>24</sup> there is a growing argument for an even larger and more capable fleet.

**Shipbuilding Capacity.** Over a decade, from 2007–2017, as U.S. shipbuilding capacity languished, China's navy grew by more than 27 percent to 335 warships, and its commercial shipbuilding grew by 60 percent.<sup>25</sup> As of March 2020, the U.S. Navy had contracted to build 79 ships with 47 ships under construction and delivery of 12 ships expected in FY 2020.<sup>26</sup> The FY 2021 budget includes \$21 billion for the construction of eight new ships with 44 additional battle force ships and 17 unmanned ships to be purchased over the next five years in the Future Years Defense Program (FYDP).<sup>27</sup>

Specific to FY 2021, procurement includes one *Columbia*-class submarine and one *Virginia*-class submarine; two *Arleigh Burke* Flight III destroyers; one guided missile frigate; one LPD (amphibious transport dock) Flight II; and two towing, salvage, and rescue (T-ATS) ships.<sup>28</sup> In a cost-saving effort, the Navy has requested a two-ship block buy in FY 2021, which the Senate Armed Services Committee supports. Assuming that the Navy gets the required congressional authorizations, such a block purchase could be executed in October 2020.<sup>29</sup> Despite these acquisitions, the Navy will struggle to meet the 355-ship goal by 2034.

Larger outlays for new ship construction necessarily impose greater demands on shipyard infrastructure. The Navy's procurement

of 12 ships in FY 2020 marked a significant increase in shipbuilding measured against similar outlays over the past 20 years.<sup>30</sup> At the same time, to keep pace with the growing workload at public shipyards facilitating nuclear warships, new hiring has increased public shipyard labor by 16 percent since 2013.<sup>31</sup>

On average, a large U.S. warship joins the fleet three to five years after it is purchased. Importantly, any decision regarding production, maintenance, or design alternations during this long production period can have significant implications for the delivery of needed ships. Production of nuclear-powered warships (i.e., submarines and aircraft carriers) involves particular issues of shipyard capacity. The industrial base, for example, has limited excess capacity over the next 30 years to accelerate the production of attack submarines.<sup>32</sup>

With respect to aircraft carriers, the FY 2019 NDAA states: "It is the sense of Congress that the United States should accelerate the production of aircraft carriers to rapidly achieve the Navy's goal of having 12 operational aircraft carriers."<sup>33</sup> The Congressional Research Service has argued that purchasing one new aircraft carrier every three years would enable the Navy to meet this goal by 2030;<sup>34</sup> however, given the time that has already passed, such a timeline may not be entirely realistic.

The Navy's FY 2020 budget request included a two-ship aircraft carrier procurement of CVN-80 and CVN-81 in FY 2020, realizing an estimated \$3.9 billion in savings over buying the ships separately.<sup>35</sup> Under considerable bipartisan pressure, the Navy also delayed the decommissioning of USS *Truman* (CVN-75).<sup>36</sup> Keeping *Truman* operational involves increased operational costs and extensive shipyard refueling, necessitating an additional \$16.9 million in FY 2021, \$234.7 million in FY 2022, and an additional \$1.3 billion in FY 2023 and FY 2024.<sup>37</sup> Unless the Office of the Secretary of Defense and Congress provide increased funding to the Department of the Navy beginning in FY 2021, the Navy will be forced either to make cuts in its shipbuilding plan or

to curtail the development of the new lethal technologies for which the planned savings were earmarked.

Despite congressional mandates that a fleet of 12 aircraft carriers be maintained, early indications are that Secretary of the Navy Kenneth Braithwaite will defer to DOD's Cost Assessment and Program Evaluation (CAPE) and decisions by Secretary of Defense Mark Esper with regard to the number of carriers. Unofficial reporting of an internal Pentagon study suggests that the aircraft carrier fleet could shrink to nine.<sup>38</sup> Adding to this, days after that report was leaked, during a commencement speech at the U.S. Naval Academy, Esper pointed to a fleet consisting of more small surface warships, to include more lightly or unmanned ships, in order to deploy a larger fleet that is more lethal and sustainable.<sup>39</sup> In the absence of a 2020 INFSA, it is impossible to ascertain either the validity of this proposal or how the capacity and capability required can be mitigated if the Navy is directed to implement further reductions in its aircraft carrier fleet.

**Munitions.** USINDOPACOM is the primary driver of the Navy's procurement of munitions. As the Combatant Command responsible for war plans in the Pacific, USINDOPACOM bases its needs on the distances and maritime nature of war in that setting, which drives requirements for the most advanced long-range munitions. Top priorities for increased procurement are Long Range Anti-Ship Missiles (LRASM); SM-6 long-range, AIM-120D medium-range, and AIM-9X short-range anti-air missiles; MK-48 torpedoes; and BGM-109 Block IV Maritime Strike Tomahawk missiles. In order to sustain the Navy forward in conflict, upgrading of storage facilities, reassessment of prepositioning, and recapitalization of sealift are required based on the evolving Pacific security environment.<sup>40</sup>

The relatively small numbers of key munitions being purchased raise several concerns: sufficiency of the precision-guided munitions stockpiles, the surge capacity of industry to meet demand while in conflict, and security of the supply chain.<sup>41</sup> Even should munitions

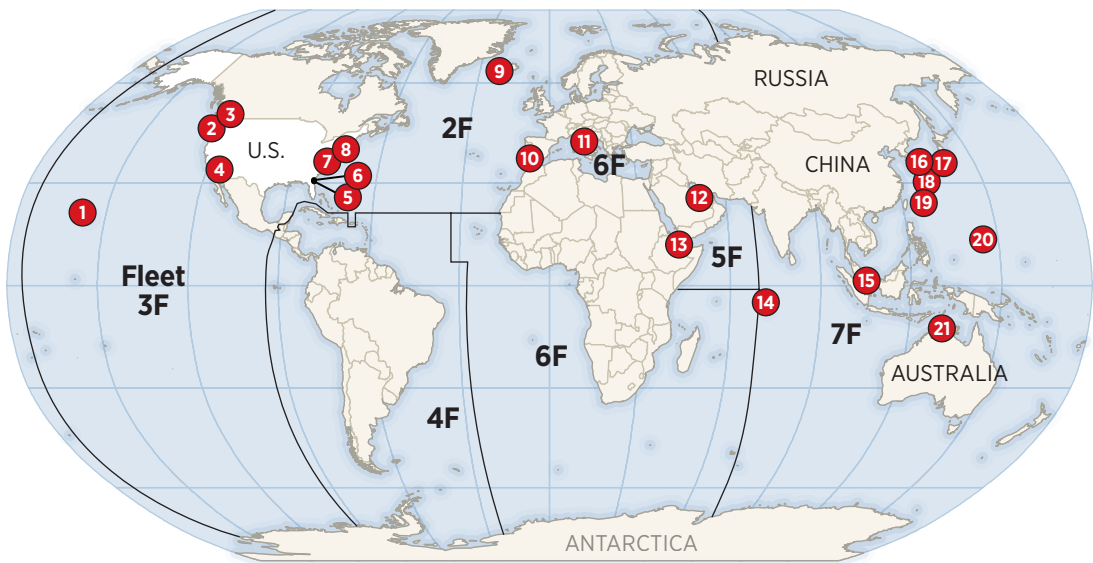
be staged and produced in the numbers needed, there remain serious concerns about the ability to move them and restock warships in a timely manner during conflict: a role for which sealift is critical.<sup>42</sup>

**Manpower.** The Navy assesses that end-strength manpower will need to grow by approximately 35,000 sailors to support a 355-ship Navy.<sup>43</sup> To improve personnel readiness and meet the demands of a growing fleet, the Navy is adding 5,100 sailors in FY 2020.<sup>44</sup> The proposed FY 2021 budget continues these increases in active-duty manning end strength by an additional 7,300 sailors.<sup>45</sup> Although the Navy is working proactively to address manning shortfalls and anticipate the demands of a growing fleet, Admiral Christopher Grady, Commander of United States Fleet Forces Command, informed Congress in February 2019 that the Navy has about 6,200 fewer sailors than it needs to meet at-sea manning requirements.<sup>46</sup>

After insufficient crew manning was found to be a contributing factor in the fatal USS *Fitzgerald* and USS *John S. McCain* collisions, the Navy increased the minimum required number of sailors on all ship classes between 4 percent and 14 percent, exacerbating manning shortfalls. The Navy is taking proactive approaches to meet these challenges head on by increasing the number of recruiters; focusing 70 percent of recruiting campaigns on digital platforms; reassessing some outdated recruiting policies; and offering targeted recruitment bonuses for critical Navy occupations such as nuclear power specialties, special forces (SEALs), and explosive ordnance disposal technicians.

However, the Navy faces several persistent challenges in meeting the growing demand for sailors: Only 29 percent of young adults qualify to join the military, and only 7 percent of young Americans are interested in enlisting in the Navy.<sup>47</sup> Despite this, the Navy has been able to make progress, reducing gapped billets from 6,500 to 4,900 over the year ending in December 2019 while meeting retention goals for all zones in 2019 and retaining 76 percent of the force.<sup>48</sup> Moreover, despite a three-week pause

## Key U.S. Naval Installations



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| <p><b>1</b> Joint Base Pearl Harbor-Hickham, HI<br/>U.S. Pacific Fleet headquarters</p> <p><b>2</b> Naval Base Kitsap</p> <p><b>3</b> Naval Station Everett, WA</p> <p><b>4</b> Naval Base San Diego and Naval Base Coronado, CA<br/>U.S. Third Fleet headquarters</p> <p><b>5</b> Naval Station Mayport, FL<br/>U.S. Fourth Fleet headquarters</p> <p><b>6</b> Naval Submarine Base King's Bay, GA</p> <p><b>7</b> Naval Base Norfolk and Joint Expeditionary Base Little Creek, VA<br/>U.S. Fleet Forces Command and U.S. Second Fleet headquarters</p> <p><b>8</b> Naval Submarine Base New London, CT</p> <p><b>9</b> Keflavik, Iceland—Expeditionary Maritime Operations Center</p> <p><b>10</b> Naval Station Rota, Spain</p> <p><b>11</b> Naval Support Activity Gaeta, Italy<br/>U.S. Sixth Fleet headquarters</p> | <p><b>12</b> Naval Support Activity, Bahrain<br/>U.S. Fifth Fleet headquarters</p> <p><b>13</b> Lemonnier, Djibouti—Camp Lemonnier</p> <p><b>14</b> Diego Garcia—Navy Support Facility Diego Garcia</p> <p><b>15</b> Singapore—Commander Logistics Group Western Pacific</p> <p><b>16</b> Buson, South Korea—Fleet Activities Chinhae Navy Base</p> <p><b>17</b> U.S. Fleet Activity Yokosuka, Japan<br/>U.S. Seventh Fleet headquarters</p> <p><b>18</b> U.S. Fleet Activity Sasebo, Japan</p> <p><b>19</b> Okinawa, Japan—Naval Base White Beach</p> <p><b>20</b> Naval Base Guam—Navy Expeditionary Force Command Pacific headquarters</p> <p><b>21</b> Darwin, Australia—Marine Rotational Force Darwin</p> |
|--|---|

**NOTE:** Fleet boundaries are approximate.

**SOURCE:** Heritage Foundation research.

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in recruit training caused by the coronavirus, the Navy remains confident that larger class sizes will allow it to meet its FY 2020 recruiting goal of 40,800 new sailors.<sup>49</sup>

**Posture/Presence.** To provide continual presence and readiness for the fleet, the FY 2021 budget funds each ship 58 days underway while deployed, and 24 days underway while non-deployed per quarter with an increase of 6.5 percent over last year for ship operations funding. Importantly, the FY 2021 budget increases the Flying Hour program by 5.8 percent with the objective of having squadrons combat-ready upon deployment.<sup>50</sup> As of July 10, 2020, of a total battle force of 300 ships, 64 (21 percent) were deployed forward, and 32 (11 percent) were being used for local operations and training.<sup>51</sup>

While the Navy remains committed to deploying roughly a third of its fleet at all times, it increasingly struggles to maintain this ratio. Given Combatant Commanders' requirements for naval presence, there is impetus to have as many ships forward deployed as possible by:

- **Homeporting:** The ships, crew, and their families are stationed at the port or based abroad (e.g., a CSG in Yokosuka, Japan).
- **Forward Stationing:** Only the ships are based abroad while crews are rotated out to the ship.<sup>52</sup> This deployment model is currently used for Littoral Combat Ships (LCS) and *Ohio*-class guided missile submarines (SSGNs) manned with rotating blue and gold crews, effectively doubling the normal forward deployment time (e.g., LCS in Singapore).

These options allow one forward-based ship to provide a greater level of presence than four ships based in the continental United States (CONUS) by offsetting the time needed to transit ships to and familiarize their crews with distant theaters.<sup>53</sup> This is captured in the Navy's GFM planning assumptions: a forward-deployed presence rate of 19 percent for a CONUS-based ship compared to

a 67 percent presence rate for an overseas-homeported ship.<sup>54</sup>

## Capability

A complete measure of naval capabilities requires an assessment of U.S. platforms against enemy weapons in plausible scenarios employing contemporary operational concepts. The Navy routinely conducts war games, exercises, and simulations to assess this, but insight into these assessments is limited by their classified nature. This *Index* therefore assesses capability based on remaining hull life, mission effectiveness, payloads, and the feasibility of maintaining the platform's technological edge.

Most of the Navy's battle force fleet consists of legacy platforms; of the Navy's current 20 classes of ships, only eight are in production. Investments to improve lethality comprise approximately 21 percent of the Navy's budget, with future capability at approximately 11 percent and modernization at approximately 10 percent.<sup>55</sup> Highlights by platform follow.

**Strategic Nuclear Deterrence (SSBN).** *Columbia*-class is set to relieve the aging *Ohio*-class SSBN fleet. Because of the implications of this for the nation's strategic nuclear deterrence, *Columbia*-class SSBN remains the Navy's top acquisition priority.<sup>56</sup> From a purely resourcing perspective, the FY 2021 budget should ensure that the first *Columbia*-class SSBN is delivered on time for its first deterrent patrol in 2031 and that construction of a second SSBN begins in FY 2024 with serial production beginning in FY 2026.<sup>57</sup>

**Nuclear Attack Submarines (SSN).** SSNs are multi-mission platforms whose stealth enables covert intelligence collection; surveillance; anti-submarine warfare (ASW); anti-surface warfare (ASuW); special operations forces insertion and extraction; land attack strikes; and offensive mine warfare. The Navy's FY 2020 budget and shipbuilding plan reduced submarine procurement to eight Block V submarines with the Virginia Payload Module (VPM) enhancement, resulting in a reduced total Tomahawk carrying capacity of 28 missiles by 11 *Virginia*-class submarines.<sup>58</sup>

Despite this, the FY 2021 National Defense Authorization Act working its way through Congress includes \$472 million in additional funds for advance procurement to preserve a future option to buy up to 10 *Virginia*-class submarines through FY 2023.<sup>59</sup>

**Aircraft Carriers (CVN).** The Navy has 11 nuclear-powered aircraft carriers: 10 *Nimitz*-class and one *Ford*-class. The Navy has not announced any delay in USS *Ford*'s first operational deployment in FY 2022. The second ship in the class, *John F. Kennedy* (CVN-79), christened on December 7, 2019, and launched two-months early on December 16, 2019, is 68 percent construction complete.

**Large Surface Combatants.** Retirement of the two oldest *Ticonderoga*-class cruisers, scheduled for FY 2020, has been deferred to FY 2021 to allow the Navy to assess the cost of maintaining them versus the increased lethality that would come from modernizing these ships.

The Navy's FY 2021 budget request procures two *Arleigh Burke*-class DDG-51 Flight III destroyers as part of a 10-ship Multi-Year Procurement (MYP), bringing the class size to 87 ships.<sup>60</sup> To reach the goal of 355 ships by 2034, according to the Chief of Naval Operations, the Navy plans several "class-wide service life extensions." The FY 2020 budget, for example, included \$4 billion for modernization of 19 guided missile destroyers from FY 2021 through FY 2024.<sup>61</sup> In an effort to sustain the industrial base for these ships, the Senate Armed Services Committee's NDAA mark for the FY 2021 budget included \$260 million in additional funds to procure *Arleigh Burke*-class long lead time materials.<sup>62</sup> On July 23, 2020, the Senate passed its version of the FY 2021 NDAA, which includes these additional funds.<sup>63</sup> The House version passed on July 21, 2020, does not include these funds.<sup>64</sup> Resolution of this difference one way or the other for FY 2021 is not likely to affect the immediate build rate of these ships.

The *Zumwalt*-class DDG-1000's primary mission is surface strike (the use of missiles to attack surface ships and possibly land

targets).<sup>65</sup> The DDG-1000 was on track for final delivery at the end of March 2020 with continued testing to achieve Initial Operational Capability (IOC) by September 2021.<sup>66</sup> The DDG-1001 was commissioned on January 26, 2019, and as of March 2020 was undergoing combat system installation.<sup>67</sup>

**Small Surface Combatants.** By October 2021, beginning with USS *Montgomery* in 2019, nine Littoral Combat Ships will have deployed overseas.<sup>68</sup> Mission packages (MP) provide various warfighting capabilities—surface warfare (SUW); anti-submarine warfare (ASW); and mine countermeasures (MCM)—on one LCS hull form. MCM MP certification will be completed on *Independence* variants and *Freedom* variants by the end of calendar year 2020.<sup>69</sup> The complete mine mission packages will not reach IOC until 2022 at the earliest.

The FY 2020 budget removed planned life extensions for four mine countermeasure ships and accelerated retirement of all *Avenger*-class MCMs by FY 2023.<sup>70</sup> If delays occur, the Navy risks losing a certified and fully operational MCM capability beginning in FY 2023.

Instead of requesting additional Littoral Combat Ships, the Navy has focused investment on an initial contract for FFG(X) guided missile frigates in FY 2020. On April 30, 2020, the Navy awarded Fincantieri \$795 million to build the lead ship at its Marinette Marine shipyard in Wisconsin based on a proven design currently in service with the French and Italian navies.<sup>71</sup> The FY 2021 budget supports purchase of the second ship with annual procurement beginning in FY 2023.<sup>72</sup>

**Amphibious Ships.** Commandant of the Marine Corps General David Berger issued the 38th "Commandant's Planning Guidance" in July 2019 and "Force Design 2030" in March 2020. Both documents signaled a break with past Marine Corps requests for amphibious lift, specifically moving away from the requirement for 38 amphibious ships that it had determined were necessary to support an amphibious force of two Marine Expeditionary Brigades (MEB).<sup>73</sup> The Commandant envisions a larger yet affordable fleet of smaller, low-signature amphibious



ships that enable littoral maneuver and associated logistics support in a contested theater.<sup>74</sup> The current Navy amphibious fleet remains centered on fewer large ships.

The Navy's 12 landing ships (LSDs), the *Whidbey Island*-class and *Harpers Ferry*-class amphibious vessels, are currently scheduled to reach the end of their 40-year service lives in 2025. The 13-ship LPD-17 Flight II program will replace these legacy landing ships. The *San Antonio*-class LPD-28, currently 65 percent complete, will be delivered in September 2021,<sup>75</sup> and the Senate Armed Services Committee NDAA mark for the FY 2021 budget includes \$500 million in additional funds to procure long lead time materials for LPD-32 and LPD-33.<sup>76</sup> The Senate version of the FY 2021 NDAA passed on July 23, 2020, includes these additional funds; the House version passed on July 21, 2020, does not. Resolution of this difference one way or the other is not expected to affect the build rate in the immediate future.

As of July 15, 2020, the Navy had nine amphibious assault ships in the fleet: eight *Wasp*-class LHAs and the USS *America* LHA-6.<sup>77</sup> USS *Tripoli* (LHA-7) was delivered on February 28, 2020, and fabrication has begun on LHA-8, supporting an FY 2024 delivery.<sup>78</sup> The Senate Armed Services Committee NDAA mark for the FY 2021 budget included \$250 million in additional funds to accelerate construction of LHA-9.<sup>79</sup> The Senate version of the FY 2021 NDAA passed on July 23, 2020, includes these additional funds; the House version passed on July 21, 2020, does not. How the two chambers resolve this difference could affect the Navy's ability to sustain its amphibious capacity in the wake of the July 2020 fire on USS *Bonhomme Richard*, which makes earlier delivery of the LHA-9 more important.

**Unmanned Systems.** Currently, the Navy does not include unmanned ships in counting its battle force size. The FY 2021–FY 2025 budget includes \$12 billion for unmanned platforms, an increase of 129 percent over FY 2020 that is invested specifically in unmanned surface vessels (USV) and unmanned undersea vessels (UUV).<sup>80</sup> The Navy's single Medium

USV (MUSV) *Sea Hunter* prototype and a second scheduled for delivery in late FY 2020 will join two Large USV (LUSV) by FY 2022 under Surface Development Squadron One (SURF-DEVRON 1)<sup>81</sup> to develop associated operating requirements.<sup>82</sup> In a show of concern, both the Senate and House Armed Services Committees' NDAA marks for the FY 2021 budget included stipulations that the Navy qualify the reliability of engines and power generators before procuring unmanned surface vessels.<sup>83</sup>

In 2019, the Marine Corps' Long Range Unmanned Surface Vessel conducted autonomous navigation from Norfolk, Virginia, to Cherry Point, North Carolina, during the Advanced Naval Technology Exercise-East Super Swarm Exercise.<sup>84</sup> Because the Marine Corps will procure three vessels to conduct further evaluation and demonstration, it is unclear how this effort aligns with similar investments in the Navy's *Sea Hunter* program.

**Logistics, Auxiliary, and Expeditionary Ships.** Expeditionary support vessels are highly flexible platforms consisting of two types: Expeditionary Sea Base (ESB) for prepositioning and sustaining forward operations and shallow-draft high-speed Expeditionary Fast Transport (EPF). ESB-6 and ESB-7 are planned for delivery in FY 2022 and FY 2023, respectively, and an enhanced medical capability is planned for EPF-14.<sup>85</sup>

The Navy's Combat Logistics Force (CLF) consists of dry-cargo and ammunition ships (T-AKE); fast combat support ships (T-AOE); and oilers (AO). The CLF provides critical support that includes at-sea replenishment that enables the Navy to sustain the fleet at sea for prolonged periods.<sup>86</sup> T-AO 205 is 76 percent complete, and delivery is planned for June 2021.<sup>87</sup> The FY 2021 budget request increases towing, salvage, and rescue (T-ATS) procurement for a total of two ships and also increases resources for CLF operations and sustainment and the acquisition of two Maritime Prepositioning Force (MPF) ships.<sup>88</sup>

**Strike Platforms and Key Munitions.** The proposed budget for FY 2021 continues the Navy's focus on developing long-range,

offensive strikes launched from ships, submarines, and aircraft, including Conventional Prompt Strike (CPS); the Maritime Strike Tomahawk (MST); the Joint Standoff Weapon Extended Range (JSOW-ER); the Long-Range Anti-Ship Missile (LRASM); and the Standard Missile-6 (SM-6).

Specifically, the budget sustains the rapid prototyping of upgraded SM-2 Block IIIC and SM-6 Block IB.<sup>89</sup> It also supports procurement of 155 Block V Tactical Tomahawk (TACTOM) cruise missiles, 156 Navigation/Communication upgrade kits to improve performance in A2/AD environments, and 44 Maritime Strike Tomahawk (MST) kits in addition to 48 LRASM.<sup>90</sup> The Senate Armed Services Committee NDAA mark for the FY 2021 budget included \$26 million for 10 additional TACTOMs for a new total of 165 missiles to be purchased.<sup>91</sup> It also included \$35 million in additional funds to procure 10 additional LRASM for a new total of 58 missiles to be purchased, in part by shifting funding from Joint Air-to-Surface Stand-off Missile (JASSM) production.<sup>92</sup> The Senate version of the FY 2021 NDAA passed on July 23, 2020, includes these additional funds; the House version passed on July 21, 2020, does not.

**Shore-Based Anti-Ship Capabilities.** Following the August 2019 U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty, new conventional strike options became viable, especially when considering the use of medium-range missiles that would have great relevance along the first island chain in any conflict with China.<sup>93</sup> The FY 2020 budget included \$76 million to develop ground-launched cruise missiles.<sup>94</sup> In a sign of confidence in this capability, the Senate Armed Services Committee NDAA mark for the FY 2021 budget included \$59.6 million in additional funds to procure 36 ground-based anti-ship missiles.<sup>95</sup> Both the House and Senate versions of the FY 2021 NDAA, passed on July 21 and July 23, 2020, respectively, include this additional funding, indicating bipartisan support for increasing the Army's role in maritime combat.

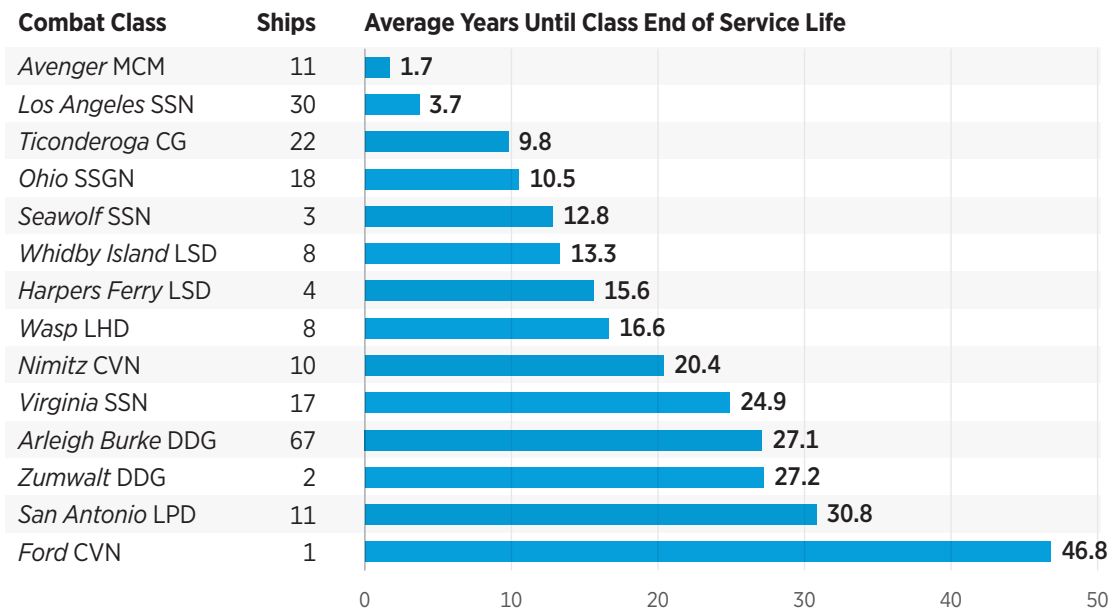
**Electronic Warfare.** Electronic Warfare (EW) is a critical element of successful modern warfare, the goal being control of the electromagnetic spectrum (EMS) by exploiting, deceiving, or denying its use by an enemy while ensuring its use by friendly forces. The final dedicated EW aircraft, EA-18G, was delivered in July 2019, meeting the Navy's requirement of nine carrier air wings, five expeditionary squadrons, and one reserve squadron.<sup>96</sup> Anticipating the EA-18G's retirement in the 2030s, the Navy has been exploring follow-on manned and unmanned systems to replace the EA-18G. In order to maintain this critical warfighting capability at capacity, however, the Navy will need to decide soon on a future platform.

**Air Early Warning.** The E-2D forms the hub of the Naval Integrated Control-Counter Air system and provides critical Theater Air and Missile Defense capabilities. The Navy's FY 2021 budget procures four aircraft with an additional 10 aircraft to be procured over the next two years.<sup>97</sup> Sustaining effective air early warning and air control of unmanned platforms remains a critical element of naval power projection.

**High Energy Laser (HEL).** The FY 2020 budget included \$101 million for the Navy Laser Family of Systems (NLFoS).<sup>98</sup> The FY 2021 budget would sustain these investments with \$170.3 million requested for directed energy programs.<sup>99</sup> A recent milestone was achieved when USS *Portland* (LPD-27) used its HEL Weapon System Demonstrator to shoot down an unmanned aerial vehicle (UAV) over the Pacific on May 16, 2020.<sup>100</sup>

**Command and Control.** The Navy has consolidated information management in the Office of the Chief Information Officer (CIO). The Navy plans to spend \$4.17 billion from FY 2021–FY 2026 to bolster cyber defense and resiliency to attack.<sup>101</sup> Such investments are meant to prevent competitors' efforts to nullify the Navy's technological advantage or interfere in its logistic infrastructure (much of it on unclassified networks), which is especially critical during early phases of a crisis.

## Navy Combat Ships Nearing End of Service Life



**NOTE:** Figures are based on calculations for October 2020.

**SOURCE:** Naval Sea Systems Command, Naval Vessel Register, "Fleet Size," <http://www.nvr.navy.mil/NVRSHIPS/FLEETSIZ.HTML> (accessed August 19, 2020).

### Readiness

In the 1980s, the Navy had nearly 600 ships in the fleet and kept roughly 100 (17 percent) deployed at any one time. Today, the fleet numbers 300 ships, of which 92 (30.7 percent) are at sea or deployed. The commanding officer's discretion time for training and crew familiarization is a precious commodity that is made ever scarcer by the increasing operational demands on fewer ships.

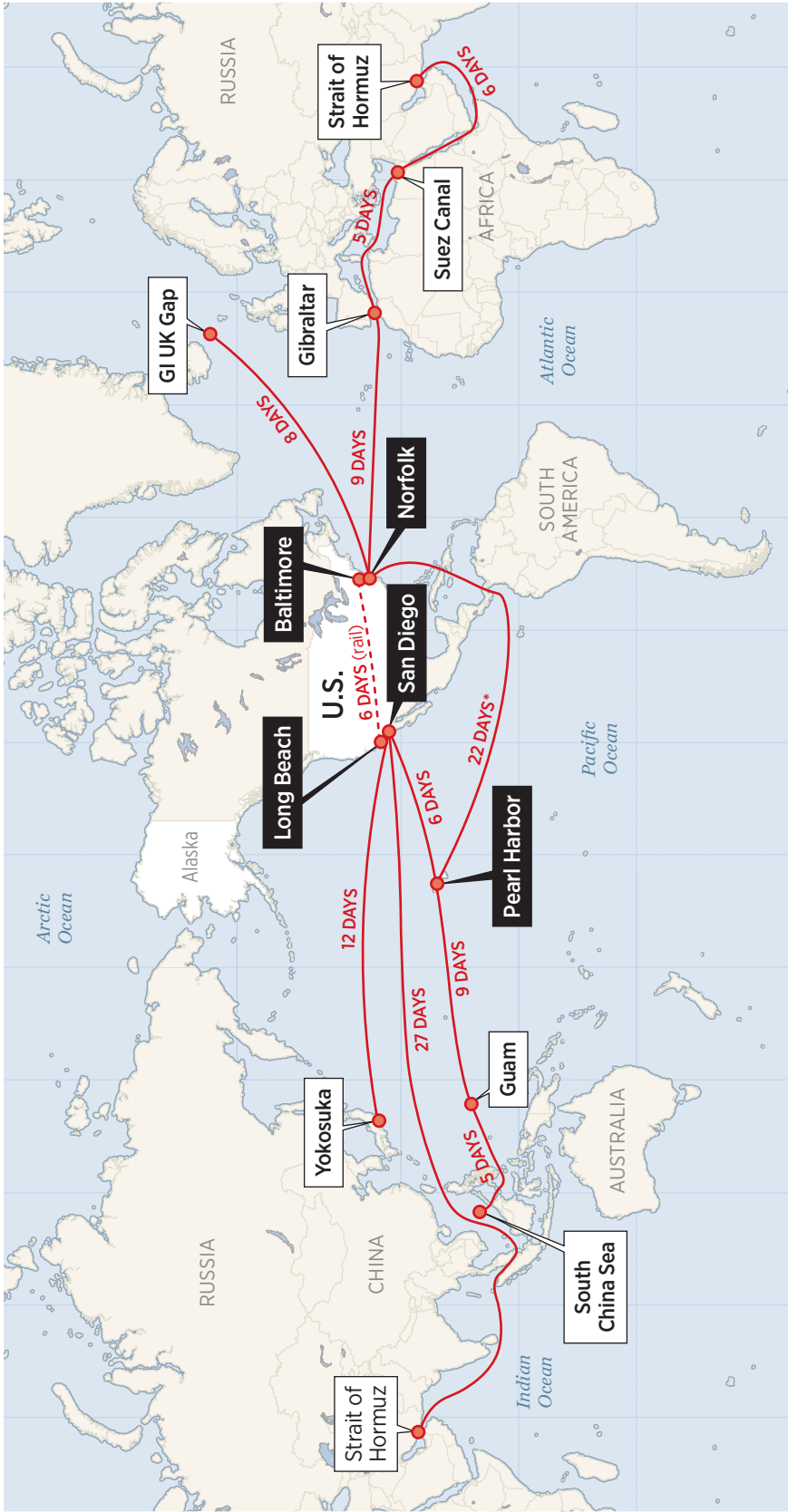
FY 2019 marked the first time in over a decade that the Defense Department and the Navy did not operate under a continuing resolution for at least part of the fiscal year. Having a full fiscal year to plan and execute maintenance and operations helped the Navy continue on its path to restoring fleet readiness,

but Admiral John Richardson, Chief of Naval Operations, testified before the Senate Armed Services Committee in April 2018 that it would take until 2021 or 2022 to restore fleet readiness to an "acceptable" level and that the continued lack of "stable and adequate funding" would delay these efforts.<sup>102</sup> Having to begin FY 2020 under a continuing resolution introduced uncertainty again, causing the planned maintenance periods of two ships, the USS *Bainbridge* (DDG-96) and USS *Gonzalez* (DDG-66), to be postponed.<sup>103</sup>

**Impact of COVID-19.** The Navy, like the rest of the nation, was not as prepared as it should have been for the COVID-19 pandemic. The coronavirus's most visible impact on the Navy was the sidelining of the USS *Theodore*

### Steaming Times to Areas of Vital U.S. National Interest

Steaming times are approximates based on an average speed of 15 knots.



\* Assumes no delay in passage through the Panama Canal.

SOURCE: Heritage Foundation research.

*Roosevelt* (CVN-71) in Guam for 55 days. As of September 23, 2020, the Navy had registered 9,930 uniformed military COVID-19 cases with one death.<sup>104</sup> The Navy also has scaled back the major biannual Rim of the Pacific Exercise (RIMPAC) to include only the at-sea portions of the event and has created a limited number of “safe haven” COVID-free ports where warships can call.<sup>105</sup>

Impacts on maintenance at the Navy’s four public shipyards necessitated the activation of 1,629 reservists to backfill a quarter of the civilian workforce deemed to be at “high risk” for COVID-19.<sup>106</sup> Despite Navy press statements of June 2, 2020, that the *Columbia* program remains on track, its timeline has been affected, and how these reservists will mitigate those delays remains an open question.<sup>107</sup> As the pandemic passes, the several audits and inspector general investigations initiated following USS *Roosevelt*’s experience are expected to lead to numerous recommendations as to how the Navy can improve its resilience in responding to future pandemics.

**Maintenance and Shipyard Capacity.** Naval Sea Systems Command completed its Shipyard Optimization and Recapitalization Plan in September 2018.<sup>108</sup> To assist in its execution, on October 1, 2019, the Navy established a new office under a Deputy Assistant Secretary of the Navy for Sustainment that will align Navy and Marine Corps maintenance and modernization efforts.<sup>109</sup> In conjunction with implementing the \$21 billion multi-year Shipyard Infrastructure Optimization Plan (SIOP), the Senate Armed Services Committee in its mark of the FY 2021 budget directed the establishment of a joint Department of the Navy–Department of Labor shipbuilding industrial base working group.<sup>110</sup> Improving public shipyard capacities is only just beginning, and the SIOP represents only one of several sustained efforts required.

A critical factor in assuring timely and quality warship maintenance periods at private shipyards is workload stability. For a sense of scale, as of December 2019, there were 45 ships in maintenance at private yards with 100 ships in various stages of planning for work in these

shipyards. In essence, maintenance on one-half of the Navy’s fleet is conducted by private shipyards.<sup>111</sup> The Navy has achieved some predictability by awarding multiple maintenance periods, giving shipyards a backlog of work that creates confidence in hiring and retaining a skilled workforce and making investments in infrastructure.

**Training, Ranges, and Live Fires.** Ship and aircraft operations and training are a critical element of fleet readiness. To this end, the Navy is seeking to expand and update instrumentation of the training range at Naval Air Station Fallon, Nevada, to enable practice with the most advanced weapon systems.<sup>112</sup> At the same time, core proficiency training in basic seamanship remains a priority.

During the summer of 2017, the U.S. Navy experienced the worst peacetime surface ship collisions in over 41 years when the USS *John S. McCain* (DDG-56) and USS *Fitzgerald* (DDG-62) collided with commercial vessels, claiming the lives of 17 sailors. Subsequently, the Vice Chief of Naval Operations ordered the *Comprehensive Review of Recent Surface Force Incidents*, which recommended corrective actions to address the root causes of poor operational risk management and unit readiness.<sup>113</sup> Concurrently, the Secretary of the Navy directed a *Strategic Readiness Review*, which made broad institutional recommendations that include (among others) the following:

- “The creation of combat ready forces must take equal footing with meeting the immediate demands of Combatant Commanders.”
- “The Navy must establish realistic limits regarding the number of ready ships and sailors and, short of combat, not acquiesce to emergent requirements with assets that are not fully ready.”
- “The Navy must realign and streamline its command and control structures to tightly align responsibility, authority, and accountability.”

- “Navy leadership at all levels must foster a culture of learning and create the structures and processes that fully embrace this commitment.”<sup>14</sup>

Despite the fact that the Navy implemented several maintenance and training reforms

to improve fleet and aviation readiness, it will take several years of Navy leadership oversight and stable funding to ensure that sailors and platforms are returned to required readiness. It will take even longer to implement the recommendations in the *Strategic Readiness Review’s* recommendations on the institutional culture.

## Scoring the U.S. Navy

### Capacity Score: Weak

This *Index* assesses that a minimum of 400 battle force ships is required for the U.S. Navy to do what is expected of it. The Navy’s current battle force fleet of 300 ships and intensified operational tempo combine to reveal a Navy that is much too small relative to its tasks. The result is a score of “weak,” unchanged from the *2020 Index*. Depending on the Navy’s ability to fund more aggressive growth options and service life extensions as identified in the FY 2020 30-year shipbuilding plan, the Navy’s capacity score could fall further.

### Capability Score: Marginal

#### Trending Toward Weak

The overall capability score for the Navy remains “marginal” with downward pressure as the Navy’s technological edge narrows against peer competitors China and Russia. The combination of a fleet that is aging faster than old ships are being replaced with new ships and the rapid growth of competitor navies with corresponding deployment of the most modern technologies does not bode well for U.S. naval power.

### Readiness Score: Marginal

#### Trending Toward Weak

The Navy’s readiness is rated “marginal” trending toward “weak” as the Navy takes overdue readiness corrective actions that are complicated by an inadequate fleet size and overwhelmed maintenance infrastructure. Echoing the CNO, on the current trajectory relative to principal competitors (i.e., Russia and China), it will take at least until 2022 for the Navy to restore its readiness to required levels.

### Overall U.S. Navy Score: Marginal

#### Trending Toward Weak

The Navy’s overall score for the *2021 Index* is “marginal” trending toward “weak.” Correcting this trend will require successfully addressing several readiness and capacity bottlenecks while seeing to it that America has an operational fleet with the numbers and capabilities that it needs to counter Russian and Chinese advances in capability.

## U.S. Military Power: Navy

|                | VERY WEAK | WEAK | MARGINAL | STRONG | VERY STRONG |
|----------------|-----------|------|----------|--------|-------------|
| Capacity       |           | ✓    |          |        |             |
| Capability     |           |      | ✓        |        |             |
| Readiness      |           |      | ✓        |        |             |
| <b>OVERALL</b> |           |      | ✓        |        |             |

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Aircraft Carrier

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b><i>Nimitz-Class Aircraft Carrier (CVN-68)</i></b><br/>Inventory: <b>10</b><br/>Fleet age: <b>28</b> Date: <b>1975</b></p> <p>The <i>Nimitz</i>-class is a nuclear-powered multipurpose carrier. The aircraft carrier and its embarked carrier air wing can perform a variety of missions including maritime security operations and power projection. Its planned service life is 50 years. The class will start retiring in FY 2025 and will be replaced by <i>Ford</i>-class carriers.</p> | 3         | 3                | <p><b><i>Ford-Class Aircraft Carrier (CVN-78)</i></b><br/>Timeline: <b>2017-2032</b></p> <p>Currently in production, the <i>Ford</i>-class will replace the <i>Nimitz</i>-class aircraft carriers. The <i>Ford</i>-class design uses the basic <i>Nimitz</i>-class hull form but incorporates several improvements to achieve: 33 percent higher sortie rate; a smaller crew with approximately 600 fewer sailors; two-and-a-half times greater electrical power, and more than \$4 billion in life-cycle cost savings over the <i>Nimitz</i>-class</p> | 2          | 2            |
| <p><b><i>Ford-Class Aircraft Carrier (CVN-78)</i></b><br/>Inventory: <b>1</b><br/>Fleet age: <b>3</b> Date: <b>2017</b></p> <p>The <i>Ford</i>-class incorporates new technologies that will increase aircraft sortie rates, reduce manning, provide greater electrical power for future weapons systems, and decrease operating costs. Its planned service life is 50 years.</p>  | 5         | 4                | <p><b>PROCUREMENT</b></p> <p>3</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$34,680    \$18,291</p>   |            |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Large Surface Combatant

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|--|-----------|------------------|--|------------|--------------|
| <p><b><i>Ticonderoga-Class Cruiser (CG-47)</i></b><br/>Inventory: <b>22</b><br/>Fleet age: <b>31.5</b> Date: <b>1983</b></p> <p>The <i>Ticonderoga</i>-class is a multi-mission battle force ship equipped with the Aegis Weapons System. While it can perform strike, anti-surface warfare and anti-submarine warfare, its primary focus is air and missile defense. Having a life expectancy of 40 years, the Navy plans to retire eight of the 22 CGs between FY 2021 and FY 2024.</p>    | 2         | 3                | <p><b><i>Zumwalt-Class Destroyer (DDG-1000)</i></b><br/>Timeline: <b>2016–2022</b></p> <p>The DDG-1000 was designed to be a new-generation destroyer capable of handling more advanced weapon systems for long-range strike with a hull design aimed to reduce radar detectability for its original primary mission of naval surface fire support (NSFS). The DDG-1000 program was intended to produce a total of 32 ships, but this number reduced to three. The first DDG-1000 was commissioned in October 2016.</p> | 1          | 1            |
| <p><b><i>Zumwalt-Class Destroyer (DDG-100)</i></b><br/>Inventory: <b>1</b><br/>Fleet age: <b>4</b> Date: <b>2016</b></p> <p>The <i>Zumwalt</i>-class is multi-mission destroyer that incorporates several technological improvements, such as a stealthy hull design and integrated electric-drive propulsion system. Although it has passed sea trials, it continues to experience problems with its combat systems. The third and final ship of the class was commissioned in FY 2020.</p> | 5         | 2                | <p><b>PROCUREMENT</b></p> <p>3</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$12,987    \$208</p>   |            |              |
| <p><b><i>Arleigh Burke-Class Destroyer (DDG-51)</i></b><br/>Inventory: <b>67</b><br/>Fleet age: <b>15</b> Date: <b>1991</b></p> <p>The <i>Arleigh Burke</i>-class is a multi-mission guided missile destroyer featuring the Aegis Weapons System with a primary mission of air defense. The Navy plans to extend the service life of the entire class to 45 years from its original life expectancy of 35–40 years.</p>  | 4         | 4                | <p><b><i>Arleigh Burke-Class Destroyer (DDG-51)</i></b><br/>Timeline: <b>1991–2029</b></p> <p>DDG-51 production was restarted in FY 2013 to make up for the reduction in DDG-1000 acquisitions. Beginning in FY 2017, all DDG-51s procured will use the Flight III design, which includes the Advanced Missile Defense Radar (AMDR), a more capable missile defense radar.</p>   | 4          | 4            |
|  |           |                  | <p><b>PROCUREMENT</b></p> <p>82    15</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$89,948    \$28,020</p>   |            |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.



# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Small Surface Combatant

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>Littoral Combat Ship (LCS)</b><br/>Inventory: <b>19</b><br/>Fleet age: <b>6.5</b> Date: <b>2008</b></p> <p>The Littoral Combat Ship includes two classes: the <i>Independence</i>-class and the <i>Freedom</i>-class. The modular LCS design depends on mission packages (MP) to provide warfighting capabilities in the SUW, ASW, and MCM mission areas. The ship has an expected service life of 25 years.</p>   | 5         |                  | <p><b>Littoral Combat Ship (LCS)</b><br/>Timeline: <b>2009–2019</b></p> <p>The LCS is intended to fulfill the mine countermeasure, antisubmarine warfare, and surface warfare roles for the Navy. It will be the only small surface combatant in the fleet once the Navy’s MCM ships retire and until the new FFG(X) enter service.</p> | 2          | 2            |
| <p><b>Avenger-Class Mine Counter Measure (MCM-1)</b><br/>Inventory: <b>11</b><br/>Fleet age: <b>28.5</b> Date: <b>1989</b></p> <p><i>Avenger</i>-class ships are designed as mine sweepers/hunter-killers capable of finding, classifying, and destroying moored and bottom mines. The class has an expected 30-year service life. The remaining MCMs are expected to be decommissioned throughout the 2020s. While there is no direct replacement single-mission MCM ship in production, the Navy plans to fill its mine countermeasure role with the LCS and its MCM MP.</p> |           |                  | <p><b>PROCUREMENT</b> <span style="margin-left: 100px;"><b>SPENDING (\$ millions)</b></span></p> <p>33 <span style="margin-left: 100px;">\$16,719</span> <span style="margin-left: 20px;">\$80</span></p>   |            |              |
|  |           | 2                | <p><b>FFG(X)</b></p> <p>A new program called the FFG(X) will augment the LCS program to fill out the remaining 20-ship small surface combatant requirement for a total of 52 Small Surface Combatants.</p>  |            |              |

## SSGN Cruise Missile Submarine

| PLATFORM   | Age Score | Capability Score | MODERNIZATION PROGRAM | Size Score | Health Score |
|--|-----------|------------------|-----------------------|------------|--------------|
| <p><b>Ohio-Class (SSGN-726)</b><br/>Inventory: <b>4</b><br/>Fleet age: <b>37.5</b> Date: <b>1981</b></p> <p>The SSGNs provide the Navy with large stealthy strike and special operations mission capabilities. From 2002 to 2007, the four oldest <i>Ohio</i>-class ballistic missile submarines were converted to guided missile submarines. Each SSGN is capable of carrying up to 154 Tomahawk land-attack cruise missiles and up to 66 special operations forces for clandestine insertion and retrieval. All four SSGNs will retire between FY 2026 and FY 2028. The Navy has tentative plans to replace the SSGNs with a new Large Payload Submarine beginning in FY 2036.</p> | 2         | 4                | None                  |            |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Attack Submarines

| PLATFORM  | Age Score                  | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |             |                        |                      |                            |              |                    |
|---|----------------------------|------------------|---|------------|--------------|-------------|------------------------|----------------------|----------------------------|--------------|--------------------|
| <p><b>Seawolf-Class (SSN-21)</b><br/>Inventory: <b>3</b><br/>Fleet age: <b>19</b> Date: <b>1997</b></p> <p>The <i>Seawolf</i>-class is exceptionally quiet, fast, well-armed, and equipped with advanced sensors. Though lacking a vertical launch system, the <i>Seawolf</i>-class has eight torpedo tubes and can hold up to 50 weapons in its torpedo room. Although the Navy planned to build 29 submarines, the program was cut to three submarines. The <i>Seawolf</i>-class has a 33-year expected service life. They have been succeeded by the <i>Virginia</i>-class attack submarine.</p>   | 3                          | 4                | <p><b>Virginia-Class (SSN-774)</b><br/>Timeline: <b>2004–2019</b></p> <p>The Virginia Payload Module (VPM) will be incorporated into eight of the 11 planned Block V submarines beginning in FY 2019. VPM includes four large-diameter, vertical launch tubes that can carry up to 28 additional Tomahawk missiles or other payloads.</p> | 2          | 3            |             |                        |                      |                            |              |                    |
| <p><b>Los Angeles-Class (SSN-688)</b><br/>Inventory: <b>30</b><br/>Fleet age: <b>34</b> Date: <b>1976</b></p> <p>The <i>Los Angeles</i>-class comprises the largest portion of the Navy's attack submarine fleet. They are multi-mission submarines that can perform covert intelligence collection, surveillance, ASW, ASuW, and land attack strike. The <i>Los Angeles</i>-class has a 33-year expected service life. The last <i>Los Angeles</i>-class submarine is expected to retire in the late 2020s and is being replaced by the <i>Virginia</i>-class.</p>   | 1                          | 3                | <p><b>PROCUREMENT</b>                      <b>SPENDING (\$ millions)</b></p> <table border="1"> <tr> <td>PROCUREMENT</td> <td>SPENDING (\$ millions)</td> </tr> <tr> <td>30 (Through FY 2020)</td> <td>\$79,794 (Through FY 2020)</td> </tr> <tr> <td>28 (Pending)</td> <td>\$68,285 (Pending)</td> </tr> </table>                        |            |              | PROCUREMENT | SPENDING (\$ millions) | 30 (Through FY 2020) | \$79,794 (Through FY 2020) | 28 (Pending) | \$68,285 (Pending) |
| PROCUREMENT   | SPENDING (\$ millions)     |                  |   |            |              |             |                        |                      |                            |              |                    |
| 30 (Through FY 2020)  | \$79,794 (Through FY 2020) |                  |   |            |              |             |                        |                      |                            |              |                    |
| 28 (Pending)  | \$68,285 (Pending)         |                  |   |            |              |             |                        |                      |                            |              |                    |
| <p><b>Virginia-Class (SSN-774)</b><br/>Inventory: <b>19</b><br/>Fleet age: <b>8</b> Date: <b>2004</b></p> <p>The <i>Virginia</i>-class is the U.S. Navy's next-generation attack submarine. The <i>Virginia</i>-class includes several improvements over previous attack submarine classes that provide increased acoustic stealth, improved SOF support, greater strike payload capacity and reduced operating costs. The planned service life of the <i>Virginia</i>-class is 33 years. The <i>Virginia</i>-class is in production and will replace the <i>Los Angeles</i>-class and <i>Seawolf</i>-class attack submarines as they are decommissioned.</p> | 4                          | 4                |   |            |              |             |                        |                      |                            |              |                    |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## SSBN Ballistic Missile Submarine

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score  | Health Score |
|--|-----------|------------------|---|---|--------------|
| <p><b>Ohio-Class (SSBN)</b></p> <p>Inventory: <b>14</b><br/>Fleet age: <b>31</b> Date: <b>1981</b></p> <p>The <i>Ohio</i>-class SSBN is most survivable leg of the U.S. military's strategic nuclear triad. The <i>Ohio</i> SSBN's sole mission is strategic nuclear deterrence, for which it carries long-range submarine-launched ballistic missiles. The <i>Ohio</i>-class's expected service life is 42 years. The <i>Ohio</i>-class fleet will begin retiring in 2027 at an estimated rate of one submarine per year until 2039. The <i>Ohio</i>-class is being replaced by the <i>Columbia</i>-class SSBN.</p> | 2         | 4                | <p><b>Columbia-Class (SSBN-826)</b></p> <p>Timeline: <b>TBD</b></p> <p>The 12-ship <i>Columbia</i>-class will replace the existing <i>Ohio</i>-class nuclear ballistic submarine force, which provides a credible and survivable sea-based strategic deterrent. The Navy's FY 2021 budget estimates total procurement cost for 12 ships to be \$109.8 billion. The first patrol of the lead ship, SSBN 826, is scheduled for FY 2031.</p> |   |              |
|  |           |                  | <p><b>PROCUREMENT</b></p> <p>12</p>   | <p><b>SPENDING (\$ millions)</b></p> <p>\$109,800</p> |              |

## Amphibious Warfare Ship

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score   | Health Score |
|---|-----------|------------------|--|--|--------------|
| <p><b>Wasp-Class Amphibious Assault Ship (LHD-1)</b></p> <p>Inventory: <b>8</b><br/>Fleet age: <b>21</b> Date: <b>1989</b></p> <p>The <i>Wasp</i>-class can support amphibious landing operations with Marine Corps landing craft via its well deck. It can also support Marine Air Combat Element operations with helicopters, tilt-rotor aircraft and Vertical/Short Take-Off and Landing (V/STOL). This ship has a planned 40-year service life.</p> | 3         | 3                | <p><b>America-Class (LHA-6)</b></p> <p>Timeline: <b>2004-TBD</b></p> <p>LHA Flight 0 (LHA-6 and 7) were built without a well deck to provide more space for Marine Corp aviation maintenance and storage as well as increased JP-5 fuel capacity. LHA Flight 1 (LHA-8 and beyond) will reincorporate a well deck for increased mission flexibility. The <i>America</i>-class is in production with three LHA-6s already procured. Advance procurement for LHA-9 will begin in FY 2023.</p> | 3  | 3            |
|   |           |                  | <p><b>PROCUREMENT</b></p> <p>3 1</p>   | <p><b>SPENDING (\$ millions)</b></p> <p>\$10,640 \$3,376</p> |              |
| <p><b>America-Class Amphibious Assault Ship (LHA-6)</b></p> <p>Inventory: <b>1</b><br/>Fleet age: <b>6</b> Date: <b>2014</b></p> <p>This new class of large-deck amphibious assault ships is meant to replace the retiring <i>Wasp</i>-class LHD. LHAs are the largest of all amphibious warfare ships, resembling a small aircraft carrier. The <i>America</i>-class is designed to accommodate the Marine Corps' F-35Bs.</p>                          | 5         | 4                |  |  |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Amphibious Warfare Ship

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>San Antonio-Class Amphibious Transport Dock (LPD-17)</b></p> <p>Inventory: <b>11</b><br/>Fleet age: <b>8.5</b> Date: <b>2006</b></p> <p>The LPDs have well decks that allow the USMC to conduct amphibious operations with its landing craft. The LPD can also carry four CH-46s or two MV-22s. 11 of the planned 13 Flight I LPD-17-class ships are operational with the remaining two under construction. The class has a 40-year planned service life.</p>   | 5         |                  | <p><b>San Antonio-Class Amphibious Transport Dock (LPD-17)</b></p> <p>Timeline: <b>2006-2017</b></p> <p>The 13 LPD-17s are replacements for the <i>San Antonio</i>-class LPDs. Both Flight I and Flight II LPDs are multi-mission ships designed to embark, transport, and land elements of a Marine landing force by helicopters, tilt rotor aircraft, landing craft, and amphibious vehicles.</p> <p><b>PROCUREMENT</b><br/>13</p> <p><b>SPENDING (\$ millions)</b><br/>\$21,309 \$63</p>   | 5          | 4            |
| <p><b>Whidbey Island-Class Dock Landing Ship (LSD-41)</b></p> <p>Inventory: <b>8</b><br/>Fleet age: <b>31.5</b> Date: <b>1985</b></p> <p><i>Whidbey Island</i>-class ships were designed specifically to transport and launch four Marine Corps Landing Craft Air Cushion vehicles. They have an expected service life of 40 years. All eight ships in the class will retire between FY 2026 and FY 2033. The <i>Whidbey Island</i>-class will be replaced by LPD-17 Flight II program, which began procurement in FY 2018.</p> | 2         | 3                | <p><b>LPD-17 Flight II</b></p> <p>Timeline: <b>2025-TBD</b></p> <p>Previously known as LX(R), the LPD-17 Flight II program will procure 13 ships to replace the Navy's LSD-type ships. The Navy originally planned to procure the first Flight II ship in FY 2020, however accelerated procurement funding enabled procurement of the first LPD-17 Flight II in FY 2018. The Navy delayed the second ship planned for FY 2020 until FY 2021.</p> <p><b>PROCUREMENT</b><br/>1 8</p> <p><b>SPENDING (\$ millions)</b><br/>\$2,164 \$3,577</p> | 5          | 4            |
| <p><b>Harpers Ferry-Class Dock Landing Ships (LSD-49)</b></p> <p>Inventory: <b>4</b><br/>Fleet age: <b>24</b> Date: <b>1994</b></p> <p>The <i>Harpers Ferry</i>-class reduced LCAC capacity to two while increasing cargo capacity. They have an expected service life of 40 years, and all ships will be retired by FY 2038. The LSD-49 will be replaced by the LPD-17 Flight II, which began procurement in FY 2018.</p>  |           | 3                |   |            |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Airborne Early Warning

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>E-2C Hawkeye</b><br/>Inventory: <b>50</b><br/>Fleet age: <b>37</b> Date: <b>1973</b></p> <p>The E-2C Hawkeye is a battle management and airborne early warning aircraft. The E-2C fleet received a series of upgrades to mechanical and computer systems around 2000. While still operational, the E-2C is nearing the end of its service life and is being replaced by the E-2D Advanced Hawkeye.</p> | 1         | 3                | <p><b>E-2D Advanced Hawkeye</b><br/>Timeline: <b>2014–2022</b></p> <p>The E-2D Advanced Hawkeye replaces the legacy E-2C and is in production. The Navy received approval for a five-year multi-year procurement plan beginning in FY 2019 for 24 aircraft to complete the program of record.</p> <p><b>PROCUREMENT</b><br/>96 18</p> <p><b>SPENDING (\$ millions)</b><br/>\$14,483 \$3,910</p> | 4          | 4            |
| <p><b>E-2D Advanced Hawkeye</b><br/>Inventory: <b>32</b><br/>Fleet age: <b>4</b> Date: <b>2014</b></p> <p>The E-2D program is the next-generation, carrier-based early-warning, command, and control aircraft that provides improved battle space detection, supports theater air missile defense, and offers improved operational availability.</p>   | 5         | 4                |   |            |              |

## Electronic Attack Aircraft

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>EA-18G Growler</b><br/>Inventory: <b>158</b><br/>Fleet age: <b>7</b> Date: <b>2009</b></p> <p>The EA-18G Growler is the U.S. Navy's electronic attack aircraft, providing tactical jamming and suppression of enemy air defenses. The final EA-18G aircraft was delivered in FY 2018, bringing the total to 160 aircraft and fulfilling the Navy's requirement. It replaced the legacy EA-6B Prowlers.</p> | 5         | 4                | None                |            |              |

**NOTE:** See page 402 for details on fleet ages, dates, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2020 ■ Pending

## Fighter/Attack Aircraft

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|--|-----------|------------------|--|------------|--------------|
| <p><b>F/A-18E/F Super Hornet</b></p> <p>Inventory: <b>584</b><br/>Fleet age: <b>16</b> Date: <b>2001</b></p> <p>The F/A-18 E/F Super Hornet has longer range, greater weapons payload, and increased survivability than the F/A-18A-D Legacy Hornet. The Navy plans to achieve a 50/50 mix of two F-35C squadrons and two F/A-18E/F Block III squadrons per carrier air wing by the mid-2030s. The ongoing service life extension program will extend the life of all Super Hornets to 9,000 flight hours.</p> | 3         | 3                | <p><b>F-35C Joint Strike Fighter</b></p> <p>Timeline: <b>2019-TBD</b></p> <p>The C-variant is the Navy's fifth-generation aircraft, bringing radar-evading technology to the carrier deck for the first time. The F-35C performs a variety of missions to include air-to-air combat, air-to-ground strikes, and ISR missions.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>118 251 \$19,831 \$30,276</p> | 2          | 3            |
| <p><b>F-35C Joint Strike Fighter</b></p> <p>Inventory: <b>28</b><br/>Fleet age: <b>2</b> Date: <b>2019</b></p> <p>The C-variant is the Navy's fifth-generation aircraft, bringing radar-evading technology to the carrier deck for the first time. The F-35C performs a variety of missions to include air-to-air combat, air-to-ground strikes, and ISR missions.</p>   | 5         | 4                | <p><b>F/A-18 Super Hornet</b></p> <p>The Navy plans to buy 108 Block III Super Hornets by 2024 and modernize most of its existing Super Hornets to Block II standards. All of Block III Super Hornets will have a lifespan of 10,000 flight hours, which is 50 percent greater than that of earlier F/A-18E/F aircraft.</p>  |            |              |

**NOTES:** See Methodology for descriptions of scores. Fleet age is the average age of platform since commissioning. The date for ships is the year of commissioning. Inventory for aircraft is estimated based on the number of squadrons. The date for aircraft is the year of initial operational capability. The timeline for ships is from the year of first commissioning to the year of last delivery. The timeline for aircraft is from the year of first year of delivery to the last year of delivery. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E). The total program dollar value reflects the full F-35 joint program, including engine procurement. The Navy is also procuring 67 F-35Cs for the Marine Corps. Age of fleet is calculated from date of commissioning to January 2016.

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9. U.S. Navy, Office of the Chief of Naval Operations, Deputy Chief of Naval Operations (Warfare System Requirements—OPNAV N9), *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2020*, March 2019, p. 5, <https://www.secnav.navy.mil/fmc/fmb/Documents/20pres/PB20%2030-year%20Shipbuilding%20Plan%20Final.pdf> (accessed July 13, 2020). Emphasis in original.
10. On March 2, 2020, the CNO announced work on a forthcoming maritime strategy that will bring together the Navy, Marine Corps, and Coast Guard. This new strategy harkens back to 2007’s “A Cooperative Strategy for 21st Century Seapower” and its 2015 update, and when it is released in late 2020, it will replace the current FRAGO as the Navy’s strategy. While synchronizing the naval services for a more effective economy of force, however, it must not ignore the Navy’s specific challenges as articulated in the FRAGO.
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13. A leading concept is Multi-Domain and Distributed Operations, which seeks to enable U.S. forces to outmaneuver adversaries physically and cognitively, advancing the 20th century concept of combined arms into the 21st century’s requirement to operate across all domains at all times. In 2018, USINDOPACOM successfully demonstrated Multi-Domain and Distributed Operations in a major exercise, progressing the concept from experimentation to validation. For the Navy’s part, new concepts that emphasize a diffuse fleet presence are being developed and field tested. Principally, Distributed Maritime Operations (DMO), which aims to complicate an adversary’s targeting by disaggregating the fleet, is supported in turn by the concept of Distributed Lethality, which masses fires at range from a diverse family of platforms, weapons, and axis of attack. At the same time, new Marine Corps operational concepts such Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advanced Base Operations (EABO) call for smaller and more dispersed Marine units conducting missions ranging from intelligence, surveillance, and reconnaissance (ISR) to coastal defense to forward arming and refueling points (FARPs) for F-35B operations. Such dispersed expeditionary operations imply a larger number of smaller amphibious ships than the current LHA and LPD programs, possibly ranging in size from an Expeditionary Fast Transport Ship (T-EPF) to an Expeditionary Sea Base (ESB).

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26. The Honorable James F. Geurts, Assistant Secretary of the Navy, Research, Development and Acquisition ASN(RD&A); Vice Admiral James W. Kilby, Deputy Chief of Naval Operations, Warfighting Requirements and Capabilities (OPNAV N9); and Lieutenant General Eric Smith, Deputy Commandant, Combat Development and Integration, and Commanding General, Marine Corps Combat Development Command, statement on "The Department of the Navy Fiscal Year 2021 Budget Request for Seapower and Projection Forces" before the Subcommittee on Seapower and Projection Forces, Committee on Armed Services, U.S. House of Representatives, March 4, 2020, p. 3, <https://www.congress.gov/116/meeting/house/110637/witnesses/HHRG-116-AS28-Wstate-GeurtsJ-20200304.pdf> (accessed July 14, 2020).
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