

# U.S. Marine Corps

**T**he U.S. Marine Corps (USMC) is the nation's expeditionary armed force, positioned and ready to respond to crises around the world. Marine units assigned aboard ships ("soldiers of the sea") or at bases abroad stand ready to project U.S. power into crisis areas. Marines also serve in a range of unique missions, from combat defense of U.S. embassies under attack abroad to operating the President's helicopter fleet.

Although Marines have a wide variety of individual assignments, the focus of every Marine is on combat: Every Marine is first a rifleman. The USMC has positioned itself for crisis response and has evolved its concepts to leverage its equipment more effectively to support operations in a heavily contested maritime environment such as the one found in the Western Pacific.

As of February 2018, 35,200 Marines (roughly one-third of Marine Corps operating forces)<sup>1</sup> were deployed around the world "to assure our allies and partners, to deter our adversaries, and to respond when our...citizens and interests are threatened."<sup>2</sup> In 2017, "Marines executed approximately 104 operations, 87 security cooperation events with partners and allies, and participated in 61 major exercises" in addition to providing substantial support to civil authorities in "Texas, Florida, Puerto Rico and the U.S. Virgin Islands after recent Hurricanes Harvey, Irma and Maria wreaked havoc on the homeland."<sup>3</sup>

Pursuant to the Defense Strategic Guidance (DSG), maintaining the Corps' crisis response capability is critical. Thus, given the fiscal constraints imposed, the Marines have

prioritized "near-term readiness" at the expense of other areas such as capacity, capability, modernization, home station readiness, and infrastructure.<sup>4</sup> However, the President's fiscal year (FY) 2019 budget request states that the service will now "prioritize modernization."<sup>5</sup> This is consistent with and central to its readiness-recovery efforts and represents a shift to a longer-term perspective. Recapitalization and repair of legacy systems is no longer sufficient to sustain current operational requirements. According to General Glenn Walters, Assistant Commandant of the Marine Corps:

After years of prioritizing readiness to meet steady-state requirements, our strategy now defines readiness as our ability to compete, deter and win against the rising peer threats we face. We define readiness by whether we possess the required capabilities and capacity we need to face the threats outlined in the NDS.<sup>6</sup>

## Capacity

The measures of Marine Corps capacity in this *Index* are similar to those used to assess the Army's: end strength and units (battalions for the Marines and brigades for the Army). The Marine Corps' basic combat unit is the infantry battalion, which is composed of approximately 900 Marines and includes three rifle companies, a weapons company, and a headquarters and service company.

In 2011, the Marine Corps maintained 27 infantry battalions in its active component at an authorized end strength of 202,100.<sup>7</sup> As budgets declined, the Corps prioritized readiness

through managed reductions in capacity, including a drawdown of forces, and delays or reductions in planned procurement levels. After the Marine Corps fell to a low of 23 active component infantry battalions in FY 2015,<sup>8</sup> Congress began to fund gradual increases in end strength, returning the Marine Corps to 24 infantry battalions.

President Donald Trump's FY 2019 budget request would increase the size of the active component Marine Corps by only 1,500 over the congressionally authorized level of 185,000 in FY 2018.<sup>9</sup> Despite increases in active component end strength, the President's FY 2019 budget provides enough support for only 24 infantry battalions. Additional manpower will backfill existing units and help the Marine Corps to recruit and retain individuals with critical skillsets and specialties.

One impact of reduced capacity is a strain on Marines' dwell time. Cuts in capacity—the number of units and individual Marines—enabled the Marine Corps to disperse the resources it did receive among fewer units, thus maintaining higher readiness levels throughout a smaller force. However, without a corresponding decrease in operational requirements, demand for Marine Corps units and assets has resulted in unsustainable deployment rates.<sup>10</sup> For example, as a result of sustained engagement in the Middle East, diminished capacity, and increased operational tempo (OPTEMPO), Marine Corps tactical aviation units have been operating under a surge condition (in excess of a 1:2 deployment-to-dwell ratio) “for more than fifteen years.”<sup>11</sup> This increased deployment frequency has exacerbated the degradation of readiness as people and equipment are used more frequently with less time to recover between deployments.

The stated ideal deployment-to-dwell (D2D) time ratio is 1:3 (seven months deployed for every 21 months at home).<sup>12</sup> This leaves more time available for training and recovery and provides support for a “ready bench,” without which readiness investments are immediately consumed. Current budget constraints support only “an approximate 1:2 D2D ratio in

the aggregate.”<sup>13</sup> A return to BCA-level budget caps could reduce capacity even further, and the dwell ratio for the Marine Corps could fall to 1:1.<sup>14</sup> The same problems are present across the Marine Corps' aviation units and amphibious assets.

Infantry battalions serve as a surrogate measure for the Corps' total force. As the first to respond to many contingencies, the Marine Corps requires a large degree of flexibility and self-sufficiency, and this drives its approach to organization and deployment of operational formations that, although typically centered on infantry units, are composed of ground, air, and logistics elements. Each of these assets and capabilities is critical to effective deployment of force, and any one of them can be a limiting factor in the conduct of training and operations.

**Aviation.** Marine aviation has been particularly stressed by insufficient funding. Although operational requirements have not decreased, fewer Marine aircraft are available for tasking or training. For example, according to its *2018 Marine Aviation Plan*, the USMC currently fields 18 tactical fighter squadrons,<sup>15</sup> compared to 19 in 2017<sup>16</sup> and around 28 during Desert Storm.<sup>17</sup> This is a decrease from 2017, but the Marine Corps has begun to increase quantities of aircraft in some of its legacy squadrons. In 2016, “shortages in aircraft availability due to increased wear on aging aircraft and modernization delays” led the Corps to reduce the requirement of aircraft per squadron for the F/A-18, CH-53E, and AV-8B temporarily in order to provide additional aircraft for home station training.<sup>18</sup> As availability of legacy aircraft has slowly improved—the result of increased funding for spare parts and implementation of recommendations from independent readiness reviews—the Marine Corps has increased unit “flight line entitlements for F/A-18s and AV-8Bs back to 12 and 16, respectively.”<sup>19</sup>

Although budget increases have yielded incremental improvements, however, the Marine Corps remains “20% short of the required aircraft to meet Congress' [readiness requirements].”<sup>20</sup> The transfer of legacy Hornets from

the Navy will contribute to existing inventory, and increased funding for spare parts will increase availability within the current inventory, but meaningful capacity increases in Marine aviation will depend on procurement of new systems. For example, the Corps' heavy-lift capability is filled by the CH-53E, of which it maintains only 143 airframes, only 37 percent of which are considered flyable.<sup>21</sup> The Corps began a reset of the CH-53E in 2016 to bridge the procurement gap and aims to "reset...the entire 143-aircraft fleet by FY20,"<sup>22</sup> but this will still leave the service 57 aircraft short of the stated heavy-lift requirements of 200 airframes, and the Marine Corps will not have enough helicopters to meet its heavy-lift requirement without the transition to the CH-53K.<sup>23</sup>

According to the *2018 Marine Aviation Plan*, the transition to the Osprey is 80 percent complete, with 15 fully operational squadrons in the active component and the 18th (and final) squadron planned for activation in FY 2019.<sup>24</sup> However, the procurement objective could increase to 380 aircraft pending the results of an ongoing requirements-based analysis.<sup>25</sup> The Osprey has been called "our most in-demand aircraft,"<sup>26</sup> and with only a year of planned procurement remaining, the Marine Corps will have to reconcile high OPTEMPOs with the objective of maintaining the platform in inventory "for at least the next 40 years."<sup>27</sup>

Shallow acquisition ramps for the F-35 pose similar problems for the service's fighter fleet. As the F-35 enters into service and legacy platforms reach the end of their service lives, the Marine Corps expects a near-term inventory challenge due to a combination of reduced Joint Strike Fighter (JSF) procurement, increasing tactical aircraft utilization rates, and shortfalls in F/A-18A-D and AV-8B depot facility production.<sup>28</sup> Any reduction in Marine aviation capability has a direct effect on overall combat capability, as the Corps usually fights with its ground and aviation forces integrated as Marine Air-Ground Task Forces (MAGTFs).

Although amphibious ships are assessed as part of the Navy's fleet capacity, Marines operate and train aboard naval vessels, making

"the shortage of amphibious ships...the quintessential challenge to amphibious training."<sup>29</sup> The Navy currently operates only 32 ships and is projected to continue operating short of the 38-ship requirement until FY 2033, thus limiting what the Marine Corps can do in operational, training, and experimentation settings.<sup>30</sup> Because of this chronic shortfall in amphibious ships, the USMC has relied partially on land-based Special Purpose Marine Air-Ground Task Forces (SPMAGTFs). While SPMAGTFs have enabled the Corps to meet Joint Force requirements, land-based locations "lack the full capability, capacity and strategic and operational agility that results when Marine Air-Ground Task Forces (MAGTFs) are embarked aboard Navy amphibious ships."<sup>31</sup>

The USMC continues to invest in the recapitalization of legacy platforms in order to extend platform service life and keep aircraft and amphibious vehicles in the fleet, but as these platforms age, they also become less relevant to the evolving modern operating environment. Thus, while they do help to maintain capacity, programs to extend service life do not provide the capability enhancements that modernization programs provide. The result is an older, less-capable fleet of equipment that costs more to maintain.

## Capability

The nature of the Marine Corps' crisis response role requires capabilities that span all domains. The USMC ship requirement is managed by the Navy and is covered in the Navy's section of the *Index*. The Marine Corps is focusing on "essential modernization" and emphasizing programs that "underpin our core competencies," making the Amphibious Combat Vehicle (ACV) and F-35 JSF programs its top two priorities.<sup>32</sup> However, modernization spending still accounts for only 14 percent of the Marine Corps' proposed FY 2019 budget,<sup>33</sup> compared to 21 percent for the Army, 47 percent for the Air Force, and 45 percent for the Navy.<sup>34</sup> The Corps' aircraft, tanks, and ground combat vehicles are some of the oldest in the entire U.S. inventory.

Of the Marine Corps' current fleet of vehicles, its amphibious vehicles—specifically, the Assault Amphibious Vehicle (AAV-7A1) and Light Armored Vehicle (LAV)—are the oldest, with the AAV-7A1 averaging over 40 years old and the LAV averaging 26 years old.<sup>35</sup> The AAV-7A1 is undergoing survivability upgrades. Following the successful test and evaluation of 10 initial prototype vehicles in 2016, the DOD awarded Science Applications International Corporation (SAIC) a low-rate initial production contract for the AAV Survivability Upgrade (AAV SU) in August 2017.<sup>36</sup> The AAV SU is slated to reach full-rate production in FY 2019.<sup>37</sup> The Marine Corps has procured 48 vehicles to-date.<sup>38</sup> These upgrades will help to bridge the capability gap until the fielding of the ACV and keep the AAV SU in service until 2035.<sup>39</sup> In the meantime, the Marine Corps will “continue to spend limited fiscal resources to sustain legacy systems as a result of deferred modernization” and “risk steadily losing our capability advantage against potential adversaries.”<sup>40</sup>

Though not yet in development, service testimony notes that the Marine Corps is “beginning to look at a replacement” for the LAV, which will “help accelerate movement to the acquisition phase within the next four to five years.”<sup>41</sup> As noted, the average age of the LAV is 26 years. Comparatively, the Corps' M1A1 Abrams inventory is 28 years old with an estimated 33-year life span,<sup>42</sup> while the newest HMMWV variant has already consumed half of a projected 15-year service life.<sup>43</sup>

All of the Corps' main combat vehicles entered service in the 1970s and 1980s, and while service life extensions, upgrades, and new generations of designs have allowed the platforms to remain in service, these vehicles are quickly becoming poorly suited to the changing threat environment. The President's FY 2019 budget seeks to provide “a balanced level of attainment and maintenance of inventory in order to meet mission requirements”<sup>44</sup> and plans to invest “approximately 29 percent of its modernization resources into GCTV [ground combat tactical vehicle] systems within the FYDP.”<sup>45</sup>

The age profiles of the Corps' aircraft are similar to those of the Navy's. As of 2018, the USMC had 251 F/A-18A-Ds (including one reserve squadron)<sup>46</sup> and six EA-6Bs in its primary mission aircraft inventory,<sup>47</sup> and both aircraft have already surpassed their originally intended life spans. The Marine Corps began to retire its EA-6B squadrons in FY 2016 with the decommissioning of Marine Tactical Electronic Warfare Squadron 1, followed by deactivation of a second squadron in May 2018.<sup>48</sup> The last remaining EA-6B squadron will begin deactivation in October 2018.<sup>49</sup>

Unlike the Navy, the Corps did not acquire the newer F/A-18 E/F Super Hornets; thus, a portion of the older F/A-18 Hornets are going through a service life extension program to extend their life span to 10,000 flight hours from the original 6,000 hours.<sup>50</sup> This was intended to bridge the gap until the F-35Bs and F-35Cs enter service to replace the Harriers and most of the Hornets. However, delays in the service life extension program and “increased wear on aging aircraft” have further limited availability of the F/A-18A-D and AV-8B.<sup>51</sup>

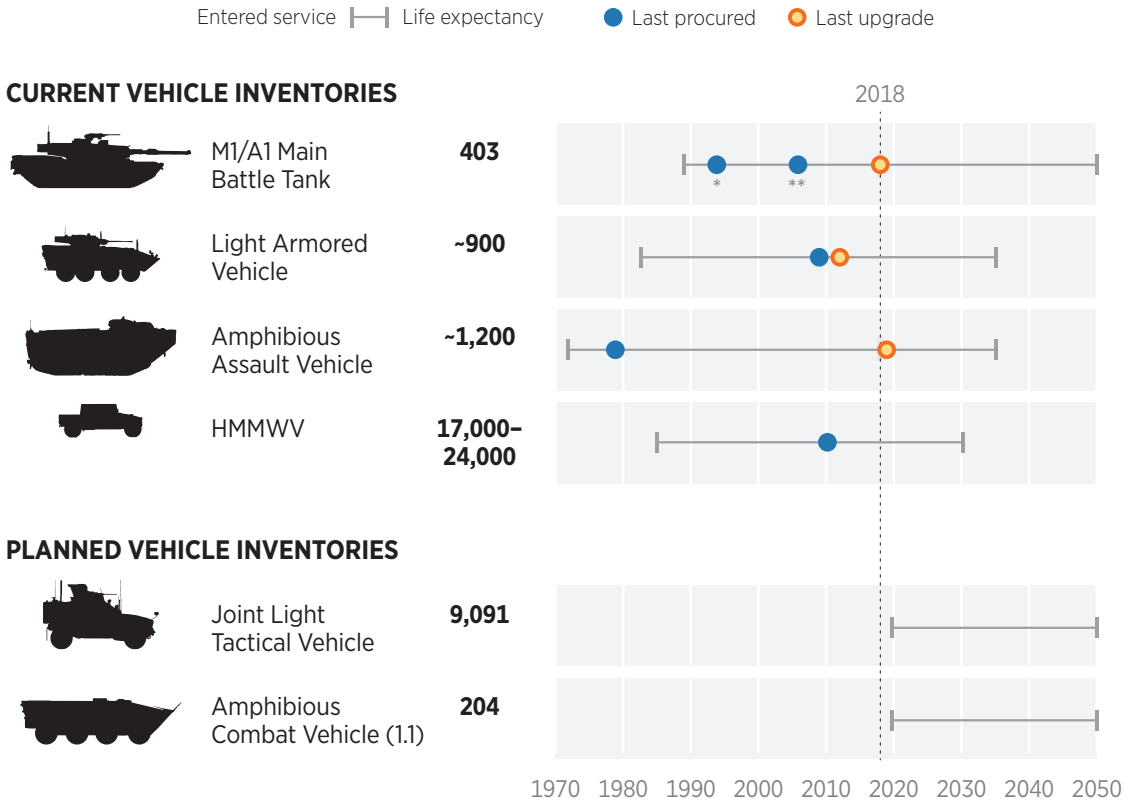
As the Navy accelerates its transition to the Super Hornet, it plans to transfer some of its “best of breed” aircraft from its F/A-18A-D inventory to the Marine Corps and scrap the remaining for parts to help maintain the Corps' legacy fleet through FY 2030.<sup>52</sup> The AV-8B Harrier, designed to take off from the LHA and LHD amphibious assault ships, will be retired from Marine Corps service by 2026.<sup>53</sup> The AV-8B received near-term capability upgrades in 2015, which continued in 2017 in order to maintain its lethality and interoperability<sup>54</sup> until the F-35 transition is completed in FY 2022.<sup>55</sup> The Corps declared its first F-35B squadron operationally capable on July 31, 2015, after it passed an “Operational Readiness Inspection” test.<sup>56</sup> To date, three F-35B squadrons have been delivered to the Marine Corps, including two operational squadrons and one fleet replacement squadron, totaling 57 aircraft.<sup>57</sup>

The Marine Corps has two Major Defense Acquisition (MDAP) vehicle programs: the

FIGURE 5

## Marine Corps Combat Vehicles

All of the Marine Corps' current combat vehicle fleets first entered service before 1990. Upgrades have extended the fleets, and two new vehicles are expected to enter service around 2020.



SOURCE: Heritage Foundation research. \* New \*\* From Army

heritage.org

Joint Light Tactical Vehicle (JLTV) and Amphibious Combat Vehicle.<sup>58</sup> The JLTV is a joint program with the Army to acquire a more survivable light tactical vehicle to replace a percentage of the older HMMWV fleet, originally introduced in 1985. The Army retains overall responsibility for JLTV development through its Joint Program Office.<sup>59</sup>

Following FY 2015 plans for the JLTV, the program awarded a low-rate initial production contract, which includes a future option of producing JLTVs for the Marine Corps, to defense contractor Oshkosh.<sup>60</sup> Congressional testimony indicates that if its budget permits it to do

so, the USMC may be interested in procuring a larger quantity in the long term than originally intended. Despite a delay in the program's full-rate production decision and reduced procurement quantities in FY 2016 and FY 2017, in June 2017, the Corps had still expected to complete its prior acquisition objective of 5,500 by FY 2023.<sup>61</sup> Reductions in annual procurement quantities reflect prioritization of the ACV within the USMC's ground force.<sup>62</sup>

The President's budget request for FY 2018 would fund the final year of low-rate initial production for the JLTV, including 1,642 vehicles for the Marine Corps and limited

procurement quantities for the Air Force.<sup>63</sup> Because the JLTV will not be a one-for-one replacement of the HMMWV, there are concerns that limited procurement will create a battlefield mobility gap for some units.<sup>64</sup> Although the Marine Corps reached a decision to increase its acquisition objective from 7,241 to 9,091,<sup>65</sup> this will still only partially offset the inventory of 17,000 HMMWVs.<sup>66</sup> The service is considering what percent of the fleet should be replaced by the JLTV and what percent of the requirement might be filled by lighter wheeled vehicles.<sup>67</sup> As end strength and combat units return to each of the services, this could further affect JLTV requirements and result in additional procurement demand.

The Corps has procured 844 JLTVs through FY 2018.<sup>68</sup> The lack of operational detail in the Army's Tactical Wheeled Vehicle Strategy could affect future USMC JLTV procurement and modernization plans.<sup>69</sup> The USMC expected the program to reach initial operational capability (IOC) in the fourth quarter of 2018, but this has been delayed to the first quarter of 2020 because of program disruption caused by bid protests and scheduled testing delays.<sup>70</sup> "Marines are expected to start receiving JLTVs for operational use in FY 2019," along with a full-rate production decision.<sup>71</sup> The increased acquisition objective will extend the program's procurement timeline through FY 2023.<sup>72</sup>

The Marine Corps intends to replace the AAV-7A1 with the ACV, planned "to enter the acquisition cycle at Milestone B (Engineering and Manufacturing Development) in FY2016, award prototype contracts leading to a down select to one vendor in FY2018, and [then] enter low-rate initial production."<sup>73</sup> The ACV, which took the place of the Expeditionary Fighting Vehicle (EFV), "has been structured to provide a phased, incremental capability."<sup>74</sup> The AAV-7A1 was to be replaced by the EFV, a follow-on to the cancelled Advanced AAV, but the EFV was also cancelled in 2011 as a result of technical obstacles and cost overruns. Similarly, the Corps planned to replace the LAV inventory with the Marine Personnel Carrier (MPC), which would serve as a Light

Armored Vehicle with modest amphibious capabilities but would be designed primarily to provide enhanced survivability and mobility once ashore.<sup>75</sup> However, budgetary constraints led the Corps to shelve the program, leaving open the possibility that it might be resumed in the future.

After restructuring its ground modernization portfolio, the Marine Corps determined that it would combine its efforts by upgrading 392 of its legacy AAVs and continuing development of the ACV to replace part of the existing fleet and complement the upgraded AAVs.<sup>76</sup> This would help the Corps to meet its requirement of armored lift for 10 battalions of infantry.<sup>77</sup> In June 2018, BAE Systems won the contract award to build the ACV 1.1, and it is expected to deliver the first 30 vehicles by the fall of 2019.<sup>78</sup> The Marine Corps plans to field 204 vehicles in the first increment—enough to support lift requirements for two infantry battalions.<sup>79</sup>

The ACV 1.1 platform is notable because it is an amphibious wheeled vehicle instead of a tracked vehicle, capable of traversing open water only with the assistance of Navy shore connectors such as Landing Craft, Air Cushion Vehicles (LCAC). Development and procurement of the ACV program will be phased so that the new platforms can be fielded incrementally alongside a number of modernized AAVs.<sup>80</sup> Plans call for a program of record of 694 vehicles (a combination of upgraded AAVs and ACVs), with the first battalion to reach IOC in FY 2020, and for modernizing enough of the current AAV fleet to outfit six additional battalions, two in the first increment and four in the second. The AAV survivability upgrade program will modernize the remaining four battalions, allowing the Corps to meet its armored lift requirement for 10 battalions.<sup>81</sup>

Regarding aviation, Lieutenant General Brian Beaudreault, Marine Corps Deputy Commandant for Plans, Policies, and Operations, has testified that "[t]he single most effective way to meet our NDS responsibilities, improve overall readiness, and gain the competitive advantage required for combat against state

threats is through the modernization of our aviation platforms.”<sup>82</sup> The F-35B remains the Marine Corps’ largest investment program in FY 2019. The Corps announced IOC of the F-35B variant in July 2015.<sup>83</sup> Total procurement will consist of 420 F-35s (353 F-35Bs and 67 F-35Cs). AV-8Bs and F/A-18A-Ds continue to receive interoperability and lethality enhancements in order to extend their useful service lives during the transition to the F-35, and the Corps continues to seek opportunities to accelerate procurement.<sup>84</sup>

Today, the USMC MV-22 Osprey program is operating with few problems and nearing completion of the full acquisition objective of 360 aircraft.<sup>85</sup> The Marine Corps added one squadron to its active component over the past year, bringing the total to 15 fully operational squadrons in the active component.<sup>86</sup> Two additional squadrons are expected to stand up in FY 2018, followed by the final active component squadron in FY 2019.<sup>87</sup> The MV-22’s capabilities are in high demand from the Combatant Commanders (COCOMS), and the Corps is adding capabilities such as fuel delivery and use of precision-guided munitions to the MV-22 to enhance its value to the COCOMs.

The Corps continues to struggle with sustainment challenges in the Osprey fleet. Since the first MV-22 was procured in 1999, the fleet has developed more than 70 different configurations.<sup>88</sup> This has resulted in increased logistical requirements, as maintainers must be trained to each configuration and spare parts are not all shared. The Marine Corps has developed a plan to consolidate the inventory to a common configuration at a rate of “2–23 aircraft installs per year” beginning in FY 2018.<sup>89</sup>

The USMC’s heavy-lift replacement program, the CH-53K, conducted its first flight on October 27, 2015.<sup>90</sup> The CH-53K will replace the Corps’ CH-53E, which is now 28 years old. Although “unexpected redesigns to critical components” delayed a low-rate initial production decision,<sup>91</sup> the program achieved Milestone C in April 2017, and the President’s FY 2019 budget requests \$1,601.8 million for the procurement of eight aircraft in its second year

of low-rate initial production.<sup>92</sup> The helicopter is predicted to reach IOC in 2019, almost four years later than initially anticipated.<sup>93</sup> This is of increasing concern as the Marine Corps maintains only 139 CH-53Es<sup>94</sup> and will not have enough helicopters to meet its heavy-lift requirement of 200 aircraft without the transition to the CH-53K.<sup>95</sup>

The Corps began a reset of the CH-53E in 2016 to bridge the procurement gap, but as of November 2017, it had completed the reset of only 13 CH-53Es.<sup>96</sup> The DOD plans to complete fielding of the CH-53K by FY28, but continuing resolutions “have resulted in shallow acquisition ramps” and could further delay this transition.<sup>97</sup> The FY 2019 request would continue to fund procurement totals of 194 CH-53K aircraft.<sup>98</sup>

## Readiness

The Marine Corps’ first priority is to be the crisis response force for the military, which is why investment in immediate readiness has been prioritized over capacity and capability. Although this is sustainable for a short time, future concerns when the Budget Control Act was passed are rapidly becoming impediments in the present. Modernization is now a primary inhibitor of readiness as keeping aging platforms in working order becomes increasingly challenging and aircraft are retired before they can be replaced, leaving a smaller force available to meet operational requirements and further increasing the use of remaining platforms.

With respect to training, the Marine Corps continues to prioritize training for deploying and next-to-deploy units. Marine operating forces as a whole continue to average a two-to-one deployment-to-dwell ratio.<sup>99</sup> At this pace, readiness is consumed as quickly as it is built, leaving minimal flexibility to respond to contingencies. As a result, the USMC has maintained support for current operations but “may not have the required capacity—the ‘ready bench’—to respond to larger crises at the readiness levels and timeliness required” or to support sustained conflict.<sup>100</sup>

Marine Corps guidance identifies multiple levels of readiness that can affect the ability to conduct operations:

Readiness is the synthesis of two distinct but interrelated levels. a. unit readiness—The ability to provide capabilities required by the combatant commanders to execute their assigned missions. This is derived from the ability of each unit to deliver the outputs for which it was designed. b. joint readiness—The combatant commander’s ability to integrate and synchronize ready combat and support forces to execute his or her assigned missions.<sup>101</sup>

The availability of amphibious ships, although funded through the Navy budget, has a direct impact on the Marine Corps’ joint readiness. For example, while shore-based MAGTFs can maintain unit-level readiness and conduct training for local contingencies, a shortfall in amphibious lift capabilities leaves these units without “the strategic flexibility and responsiveness of afloat forces and...constrained by host nation permissions.”<sup>102</sup>

In December 2017, a U.S. Government Accountability Office (GAO) official testified that while deploying units completed all necessary pre-deployment training for amphibious operations, the Marine Corps was “unable to fully accomplish...home-station unit training to support contingency requirements, service-level exercises, and experimentation and concept development for amphibious operations.”<sup>103</sup> A shortage of available amphibious ships was identified as the primary factor in training limitations. Of the 32 amphibious ships currently in the U.S. fleet, only 16 are considered “available to support current or contingency operations.”<sup>104</sup> While infantry battalions can maintain unit-level readiness requirements, their utility depends equally on their ability to deploy in defense of U.S. interests.

Marine aviation in particular is experiencing significant readiness shortfalls. The 2018

*Marine Aviation Plan* found that “[a]cross all of Marine aviation, readiness is below steady state requirements.”<sup>105</sup> With a smaller force structure and fewer aircraft available for training, aviation units are having difficulty keeping up with demanding operational requirements. According to Lieutenant General Stephen Rudder, Marine Corps Deputy Commandant for Aviation, most Marine aviation squadrons “still lack the required number of ready aircraft required to ‘fight tonight.’”<sup>106</sup>

As of November 2017, approximately half of the Marine Corps’ tactical aircraft were considered flyable.<sup>107</sup> This is a slight increase over FY 2018 readiness figures and has helped to improve the D2D ratio from 1:2 to 1:2.6 across the TACAIR fleet. Through investments in modernization and adequate funding for spare parts, the Marine Corps has managed to increase readiness by roughly 15 percent in the modern fleet and 10 percent in the legacy fleet.<sup>108</sup>

However, readiness gains have begun to plateau.<sup>109</sup> The Marine Corps received funding for spare parts at the “maximum executable levels” in FY 2017 and even higher levels in FY 2018.<sup>110</sup> In FY 2017, the Corps added only six ready basic aircraft to the fleet, compared to 44 in FY 2016,<sup>111</sup> yielding only modest increases in flight hours of two per crew per month in 2017. Although the Marine Corps is working to maximize their utilization, as long as it continues to rely on legacy systems, the amount of time committed to maintenance and access to spare parts will constrain aircraft availability.

Readiness rates remain particularly stressed within certain high-demand communities (including the MV-22, F/A-18, and F-35) that lack necessary numbers of available aircraft, pilots, and maintainers.<sup>112</sup> Although the MV-22 is a relatively new platform and is operating with few problems, high demand has held its readiness rates at 48 percent and forced the Marine Corps to put these aircraft “into operation as fast as they were coming off the line.”<sup>113</sup> As is the case with the Corps’ infantry battalions, this leaves little capacity available to support a “ready bench,” and immediate demand

challenges efforts to reduce the platform to a common configuration.

Availability of spare parts remains “the primary degrader of Marine aviation readiness.”<sup>114</sup> Although adequate funding for spare parts and maintenance will help to maintain current numbers of ready basic aircraft, the Marine Corps recognizes that “modernization of [its] legacy fleet is the true key to regaining readiness.”<sup>115</sup> The transition to modern systems will increase capacity, dispersing some of the strain from high utilization rates and offsetting costs from legacy platforms, which require more time and money to maintain.

For FY 2018, the Department of the Navy chose to prioritize immediate readiness by accepting “risk in facilities [and] weapons capacity,” “delay[ing] certain modernization programs,”<sup>116</sup> and “protect[ing] near-term operational readiness of its deployed and next-to-deploy units” while struggling to maintain a “ready bench.”<sup>117</sup> According to former Marine Corps Assistant Commandant General John M. Paxton, “[b]y degrading the

readiness of these bench forces to support those forward deployed, we are forced to accept increased risk in our ability to respond to further contingencies, our ability to assure we are the most ready when the nation is least ready.”<sup>118</sup> In looking beyond immediate readiness, the USMC FY 2019 budget request aims to support a “comprehensive aviation recovery plan that, *if sufficiently resourced and supported by our industrial base*, recovers the force to an acceptable readiness level by FY20 with a ready bench by FY22.”<sup>119</sup>

The Marines Corps’ Ground Equipment Reset Strategy, developed to recover from the strain of years of sustained operations in Iraq and Afghanistan, is nearing completion after being delayed from the end of FY 2017 to FY 2019. As of March 2018, the Marine Corps had reset approximately 99 percent of its ground equipment, compared to 90 percent in the prior year.<sup>120</sup> Reconstituting equipment and ensuring that the Corps’ inventory can meet operational requirements are critical aspects of readiness.

## Scoring the U.S. Marine Corps

### Capacity Score: Weak

Based on the deployment of Marines across major engagements since the Korean War, the Corps requires roughly 15 battalions for one MRC.<sup>121</sup> This translates to a force of approximately 30 battalions to fight two MRCs simultaneously. The government force-sizing documents that discuss Marine Corps composition support this. Though the documents that make such a recommendation count the Marines by divisions, not battalions, they are consistent in arguing for three Active Marine Corps divisions, which in turn requires roughly 30 battalions. With a 20 percent strategic reserve, the ideal USMC capacity for a two-MRC force-sizing construct is 36 battalions.

More than 33,000 Marines were deployed in Korea, and more than 44,000 were deployed in Vietnam. In the Persian Gulf, one of the largest Marine Corps missions in U.S.

history, some 90,000 Marines were deployed, and approximately 66,000 were deployed for Operation Iraqi Freedom. As the Persian Gulf War is the most pertinent example for this construct, an operating force of 180,000 Marines is a reasonable benchmark for a two-MRC force, not counting Marines that would be unavailable for deployment (assigned to institutional portions of the Corps) or that are deployed elsewhere. This is supported by government documents that have advocated a force as low as 174,000 (1993 Bottom-Up Review) and as high as 202,000 (2010 Quadrennial Defense Review), with an average end strength of 185,000 being recommended. However, as recent increases in end strength have not corresponded with deployable combat power, these government recommendations may have to be reassessed.

- **Two-MRC Level:** 36 battalions.
- **Actual 2018 Level:** 24 battalions.

Despite an increase in manpower, the Corps continues to operate with less than 67 percent of the number of battalions relative to the two-MRC benchmark. Marine Corps capacity is therefore scored as “weak” again in 2018.

**Capability Score: Marginal**

The Corps receives scores of “weak” for “Capability of Equipment,” “marginal” for “Age of Equipment” and “Health of Modernization Programs,” but “strong” for “Size of Modernization Program.” Therefore, the aggregate score for Marine Corps capability is “marginal.” Excluded from the scoring are various ground vehicle programs that have been cancelled and are now being reprogrammed.

**Readiness Score: Weak**

In FY 2018, the Marine Corps again prioritized next-to-deploy units. As the nation’s crisis response force, the Corps requires that all units, whether deployed or non-deployed, be ready. However, since most Marine Corps ground units are meeting readiness requirements only immediately before deployment and the Corps’ “ready bench” would “not be

as capable as necessary” if deployed on short notice, USMC readiness is sufficient to meet ongoing commitments only at reported deployment-to-dwell ratios of 1:2. This means that only a third of the force—the deployed force—could be considered fully ready. Furthermore, as of November 2017, the USMC reported that only half of its tactical aircraft were considered flyable.

Marine Corps officials have not been clear as to the status of ground component readiness during FY 2018, but in testimony to Congress during the year, as noted, they have highlighted concerns about shortfalls in service readiness to mobilize for larger-scale operational commitments. Due to the lack of a “ready bench” and a further decline in readiness levels among the USMC aircraft fleet, the *2019 Index* assesses Marine Corps readiness levels as “weak.”

**Overall U.S. Marine Corps Score: Weak**

Although 2018 congressional testimony strikes an optimistic note and increased funding for readiness and an emphasis on modernization give strong support to the Corps’ readiness-recovery efforts, the effects will take time to materialize. As a result, the Marine Corps maintains an overall score of “weak” in the *2019 Index*.

**U.S. Military Power: Marine Corps**

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

# MARINE CORPS SCORES



**Procurement and Spending** ■ Through FY 2018 ■ Pending

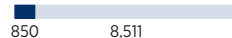
## Main Battle Tank

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>M1A1 Abrams</b> Inventory: <b>447</b> Fleet age: <b>28</b> Date: <b>1989</b>  The M1A1 Abrams Main Battle Tank provides the Marine Corps with heavy-armor direct fire capabilities. It is expected to remain in service beyond 2028.	2	1	None		

## Light Wheeled Vehicle

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>HMMWV</b> Inventory: <b>17,000</b> Fleet age: <b>10</b> Date: <b>1985</b>  The HMMWV is a light wheeled vehicle used to transport troops with some measure of protection against light arms, blast, and fragmentation. The expected life span of the HMMWV is 15 years. Some HMMWVs will be replaced by the Joint Light Tactical Vehicle (JLTV).	2	1	<b>Joint Light Tactical Vehicle (JLTV)</b>  Timeline: <b>2015–2023</b>  Currently in development, the JLTV is a vehicle program meant to replace some of the HMMWVs and improve reliability, survivability, and strategic and operational transportability. So far the program has experienced a one-year delay due to changes in vehicle requirements. This is a joint program with Army. The Marine Corps has increased its acquisition objective by 1,850 vehicles, bringing the total planned procurement to 9,091 and extending the timeline procurement through 2023.	2	5

### PROCUREMENT



### SPENDING (\$ millions)



**NOTE:** JLTV spending figures reflect the full joint program spending.

See Methodology for descriptions of scores.    Fleet age—Average age of fleet    Date—Year fleet first entered service

# MARINE CORPS SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2018 ■ Pending

## Amphibious Assault Vehicle

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>AAV</b> Inventory: ~1,200 Fleet age: 40 Date: 1972  The Amphibious Assault Vehicle transports troops and cargo from ship to shore. The AAV is undergoing a survivability upgrade to extend its life through 2035. The Marine Corps has procured 48 upgraded vehicles to-date. It will upgrade 392 in total.	1	1	<b>Amphibious Combat Vehicle (ACV) 1.1</b>  Timeline: 2014–2021  The Amphibious Combat Vehicle is now a major defense acquisition program. The ACV is intended to replace the aging AAV. ACV 1.1 will procure 204 vehicles. Delivery of the first 30 vehicles are anticipated for 2019.  <div> <div>PROCUREMENT</div> <div> <div></div> <div>26178</div> </div> </div> <div> <div>SPENDING (\$ millions)</div> <div> <div></div> <div>\$619\$1,271</div> </div> </div>	3	5
<b>LAV-25</b> Inventory: ~900 Fleet age: 26 Date: 1983  The LAV is a wheeled light armor vehicle with modest amphibious capability used for armored reconnaissance and highly mobile fire support. It has undergone several service life extensions (most recently in 2012) and will be in service until 2035.	2	1			

## Attack Helicopters

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>AH-1W Cobra</b> Inventory: 77 Fleet age: 26 Date: 1986  The Super Cobra is an attack helicopter that provides the Marines with close air support and armed reconnaissance. The Super Cobra will remain in service until 2021, when it will be replaced with the AH-1Z.	1		<b>AH-1Z</b>  Timeline: 2004–2020  The new AH-1Z Viper program is part of a larger modification program to the H-1 platform. The new H-1 rotorcraft will have upgraded avionics, rotor blades, transmissions, landing gear, and structural modifications to enhance speed, maneuverability, and payload. The AH-1Z started out as a remanufacture program, but that was later changed to a New Build program because of concerns over existing airframes. While costs have increased, the program has not met the APB breach threshold.  <div> <div>PROCUREMENT</div> <div> <div></div> <div>14841</div> </div> </div> <div> <div>SPENDING (\$ millions)</div> <div> <div></div> <div>\$11,554\$731</div> </div> </div>	5	3
<b>AH-1Z Viper</b> Inventory: 76 Fleet age: 4 Date: 2010  The AH-1Z Viper is the follow on to the AH-1W Cobra attack helicopter. The Viper will have greater speed, payload, and range, as well as a more advanced cockpit. It is expected that the AH-1Z will fully replace the AH-1W Cobra in 2021. The expected operational life span of the Viper is 30 years.		2			

See Methodology for descriptions of scores. Fleet age—Average age of fleet Date—Year fleet first entered service

# MARINE CORPS SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2018  
■ Pending

## Airborne Electronic Attack Aircraft/ Ground Attack Aircraft

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>EA-6B</b> Inventory: <b>6</b> Fleet age: <b>29</b> Date: <b>1971</b>  The Prowler provides the USMC with an electronic warfare capability. The last squadron will be retired in October 2018.	<b>1</b>	<b>1</b>	<b>F-35B/C</b>  Timeline: <b>2008–2033</b>  The Corps is purchasing 353 F-35Bs and 67 F-35Cs. The F-35B is the USMC version of the Joint Strike Fighter program. It is meant to replace the AV-8B Harrier, completing transition by 2030. The Joint Strike Fighter has had many development issues, including a Nunn–McCurdy cost breach and major development issues. The F-35B in particular has had software development problems and engine problems that led to grounding. The Marine Corps announced IOC of its second F-35B squadron in June 2016. The F-35C is not anticipated to achieve IOC until 2019.	<b>3</b>	<b>1</b>
<b>AV-8B</b> Inventory: <b>130</b> Fleet age: <b>21</b> Date: <b>1985</b>  The Harrier is a vertical/short takeoff and landing aircraft designed to fly from LHA/LHDs. It provides strike and reconnaissance capabilities. The aircraft will be retired around 2024.	<b>5</b>		<div><b>PROCUREMENT</b></div> <div><div></div><div>131289</div></div> <div><b>SPENDING (\$ millions)</b></div> <div><div></div><div>\$127,534\$278,597</div></div>		
<b>F-35B</b> Inventory: <b>50</b> Fleet age: <b>3</b> Date: <b>2015</b>  The F-35B is the Marine Corps’s short takeoff and vertical landing variant meant to replace the AV-8B Harrier. Despite some development problems, the F-35B achieved IOC in July 2015.	<b>5</b>				
<b>F/A-18 A-D</b> Inventory: <b>251</b> Fleet age: <b>26</b> Date: <b>1978</b>  Many aircraft in the F/A-18 fleet have logged about 8,000 hours compared with the originally intended 6,000. The fleet life has been extended until 2030. This is necessary to bridge the gap to when the F-35Bs and F-35Cs are available.	<b>3</b>				

See Methodology for descriptions of scores.    Fleet age—Average age of fleet    Date—Year fleet first entered service

# MARINE CORPS SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2018  
■ Pending

## Medium Lift

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>MV-22</b> Inventory: <b>277</b> Fleet age: <b>6</b> Date: <b>2007</b> <p>The Osprey is a vertical takeoff and landing tilt-rotor platform designed to support expeditionary assault, cargo lift, and raid operations. The program is still in production. The life expectancy of the MV-22 is 23 years.</p>	4	5	<b>MV-22B</b> Timeline: <b>1997–2031</b> <p>The Osprey is in production, and the platform is meeting performance requirements. The modernization program is not facing any serious issues. Procurement figures include 48 Navy MV-22s and 50 of the carrier variant CV-22s.</p> <p><b>PROCUREMENT</b></p> <p>403 59</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$47,898 \$8,341</p>	4	5

## Heavy Lift

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>CH-53E Super Stallion</b> Inventory: <b>139</b> Fleet age: <b>29</b> Date: <b>1981</b> <p>The CH-53E is a heavy-lift rotorcraft. The aircraft will be replaced by the CH-53K, which will have a greater lift capacity. The program life of the CH-53E is 41 years.</p>	2	1	<b>CH-53K</b> Timeline: <b>2017–2028</b> <p>The program is in development. It is meant to replace the CH-53E and provide increased range, survivability, and payload. The program still has not fully developed the critical technology necessary. The program has experienced delays and cost growth.</p> <p><b>PROCUREMENT</b></p> <p>6 194</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$6,969 \$24,196</p>	5	3

## Tanker

PLATFORM	Age Score	Capability Score	MODERNIZATION PROGRAM	Size Score	Health Score
<b>KC-130J</b> Inventory: <b>45</b> Fleet age: <b>10</b> Date: <b>2004</b> <p>The KC-130J is both a tanker and transport aircraft. It can transport troops, provide imagery reconnaissance, and perform tactical aerial refueling. This platform is currently in production. The airframe is expected to last 38 years.</p>	4	5	<b>KC-130J</b> Timeline: <b>1997–2028</b> <p>The KC-130J is both a tanker and transport aircraft. The procurement program for the KC-130J is not facing acquisition problems.</p> <p><b>PROCUREMENT</b></p> <p>63 41</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$4,992 \$4,904</p>	4	4

**NOTES:** The total program dollar value reflects the full F-35 joint program, including engine procurement. As part of the F-35 program, the Navy is purchasing 67 F-35Cs for the U.S. Marine Corps, which are included here. The MV-22B program also includes some costs from the U.S. Air Force procurement. The AH-1Z costs include costs of UH-1 procurement.

**SOURCE:** Heritage Foundation research using data from government documents and websites. See also Dakota L. Wood, ed., *2018 Index of U.S. Military Strength* (Washington, DC: The Heritage Foundation, 2018), <http://index.heritage.org/militarystrength/>.

See Methodology for descriptions of scores. Fleet age—Average age of fleet Date—Year fleet first entered service

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