



2024 INDEX OF  
**U.S. MILITARY  
STRENGTH**

*edited by*  
Dakota L. Wood



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# Contributors

## Heritage Experts

**Dakota L. Wood** is Senior Research Fellow for Defense Programs in the Douglas and Sarah Allison Center for National Security at The Heritage Foundation. He served for two decades as an officer in the U.S. Marine Corps, including service as a strategic analyst for the Commandant of the Marine Corps and the Secretary of Defense's Director of Net Assessment.

**Thomas W. Spoehr**, Lieutenant General, U.S. Army (Ret.), is former Director of the Center for National Defense at The Heritage Foundation. Before joining The Heritage Foundation, he served America for more than 36 years in the U.S. Army.

**Wilson Beaver** is a Policy Analyst for Defense Budgeting in the Center for National Defense.

**Ted R. Bromund, PhD**, is a Senior Research Fellow in The Heritage Foundation's Margaret Thatcher Center for Freedom.

**Bryan Burack** is a Senior Policy Advisor, China and the Indo-Pacific, in the Davis Institute's Asian Studies Center. Before joining Heritage, he was a member of the professional staff of the House Foreign Affairs Committee.

**Maiya Clark** is former Senior Research Associate in the Center for National Defense where she focused on the military industrial base.

**Michael Cunningham** is a Research Fellow in the Asian Studies Center where he focuses on Chinese politics.

**James Di Pane** is a former Policy Analyst in the Allison Center where he focused on military cyber and the U.S. Coast Guard and each year managed production of the *Index of U.S. Military Strength*.

**Jordan Embree** is a Program Coordinator and Research Assistant in the Davis Institute.

**Andrew Harding** is a Research Assistant in the Asian Studies Center where he focuses on China and the Pacific Islands.

**Bruce Klingner** is Senior Research Fellow for Northeast Asia in the Asian Studies Center. He served for two decades at the Central Intelligence Agency and the Defense Intelligence Agency.

**Daniel Kochis** is Research Fellow in European Affairs in the Davis Institute's Margaret Thatcher Center for Freedom where he specializes in trans-Atlantic security issues including NATO, U.S.-Russia relations, and the Arctic.

**Robert Peters** is Research Fellow for Nuclear Deterrence and Missile Defense in the Allison Center.

**James Phillips** is Visiting Fellow for Middle Eastern Affairs in the Davis Institute's Allison Center. He has also served at the Congressional Research Service and at the East-West Center.

**Nicole Robinson** is a Senior Research Associate in the Allison Center where she specializes in Middle East matters.

**Brent D. Sadler** is Senior Research Fellow for Naval Warfare and Advanced Technology in the Allison Center. He retired from the U.S. Navy as a captain and served for 26 years as a submarine officer aboard multiple nuclear submarines and in various senior posts including Naval Attaché, Malaysia, and Senior Advisor to the Chief of Naval Operations.

**Jeff Smith** is Director of the Asian Studies Center. He specializes in South Asia, has authored and contributed to several books on Asian security matters, and formerly served as Director of Asian Security Programs at the American Foreign Policy Council.

**John Venable** is Senior Research Fellow for Defense Policy in the Allison Center. A 25-year veteran of the U.S. Air Force and F-16 pilot, he served in three combat operations, was commander of the Thunderbirds, and earned the rank of colonel before retiring.

## External Reviewers and Expert Contributors

**Frederico Bartels** is a consultant at Pantheon Integrated Solutions.

**Michaela Dodge, PhD**, is a Research Scholar at the National Institute for Public Policy.

**Robert Soofer, PhD**, is Senior Fellow in the Atlantic Council's Scowcroft Center for Strategy and Security.

**Anna Simons, PhD**, is a Professor Emerita in the Naval Postgraduate School's Department of Defense Analysis.

Any views presented in or reflecting the results of any prepublication review of this document by an officer or employee of the United States government are rendered in his or her individual capacity and do not necessarily represent the views of the United States government or any agency thereof.

# Acknowledgments

Though it can seem a perfunctory statement, the *Index of U.S. Military Strength* truly is a team effort. This edition includes the work of 19 authors, an amazing research editor, two extraordinarily talented graphics specialists, designers and marketing specialists and web-design/digital content experts, and a very talented group of interns—Wyatt Eichholz, Jonathan Harman, Jenna Swiney, and Isaac Tang—who assisted with the research and tabulation of budget and acquisition data that make the service capability tables possible. But among the members of this team, there are a few special contributors who consistently go the extra mile to make the *Index* a very special undertaking.

With the 2024 edition, James Di Pane, Policy Analyst in the Center for National Defense, has been responsible for shepherding the production of this *Index* for five years, working with the great many people involved in making this publication a reality, both in print and on the web. The effort begins mid-spring each year and doesn't end until the approved master file is sent to the printer in November. Even then there is the work involved in ensuring that the online version is ready for posting, print copies are distributed, and rollout events are coordinated and effectively executed. The production manager—in this case James Di Pane—is the go-to person charged with keeping track of all of this. It is quite a job.

Speaking of production management, the tenth edition of anything is quite a milestone, so it is very appropriate to note the substantial contributions of Brian Slattery and Rachel Zissimos who preceded James Di Pane in managing the *Index*. Brian perhaps had the more interesting experience as he was pivotal in figuring out the people, processes, timelines, and relationships needed to take our first edition from idea to book. Brian managed the 2015–2018 editions. Rachel picked up the final portions of

the 2018 edition and continued her excellent work through the 2019 *Index*. James has handled the editions from 2020.

Senior Editor William T. Poole continues to turn prose into poetry, ensuring that what the authors want to say is conveyed to the reader in clear, accurate, coherent form. Each year, he ensures consistent tone, impeccable accuracy, and a fresh approach to conveying essential information throughout this multi-author document. In a similar way, Data Graphics Services Manager John Fleming, ably assisted by Data Graphics Designer Luke Karnick, continued his always-impressive work in giving visual life to text and statistics to convey a message with maximum impact, working with the authors to explore more creative ways to convey important information. Research Editor and Paper Production Specialist Kathleen Scaturro again used her proofreading skills to ensure a high-quality final product. Senior Graphic Designer Lydia Emrich created the cover image for this year's *Index*. Manager, Web Development and Print Production, Jay Simon and Senior Digital Strategist Augusta Cassada Irvine ensured that the presentation of *Index* materials was tuned to account for changes in content delivery as our world becomes increasingly digital, portable, and driven by social media. As with every previous edition, all of the professional editing, proofreading, and material integration into a final product occurred under the extraordinarily watchful eye of Director of Research Editors Therese Pennefather.

We believe that this *Index* helps to provide a better-informed understanding and wider appreciation of America's ability to “provide for the common defence”—an ability that undergirds The Heritage Foundation's vision of “an America where freedom, opportunity, prosperity, and civil society flourish.” The *Index* continues to be cited

and referenced across government—by Congress, the executive branch, and officials within the Department of Defense and supporting government agencies—as well as the media, academia, and policy institutes and among the public. There is no other source where one can find information about the status of U.S. allies and partners, competitors and enemies, and America’s ability to defend itself and its interests compiled in one volume and in such an easily readable, concise, and fully documented format. We remain encouraged that so many Americans are concerned about the state of affairs in and the multitude of factors affecting our country and that they turn to Heritage’s *Index of U.S. Military Strength* to know more about these things.

The Heritage Foundation seeks a better life for Americans, and this requires a strong economy, a strong society, and a strong defense. To help measure the state of the economy, Heritage publishes the annual *Index of Economic Freedom*; to help guide Congress in its constitutional exercise of the

power of the purse, Heritage scholars analyze federal spending across all sectors of the economy and put forward recommendations throughout the year that, if implemented, would make Members of Congress better stewards of the taxes paid by all Americans; and to help Americans everywhere more fully understand the state of our defenses, our Kathryn and Shelby Cullom Davis Institute for National Security and Foreign Policy is publishing this tenth annual edition of the *Index of U.S. Military Strength*.

In addition to acknowledging all of those who helped to prepare this edition, very special recognition is due to the Heritage members and donors whose support continues to make the *Index of U.S. Military Strength* possible.

Finally, as we do each year, The Heritage Foundation expresses its enduring appreciation to the members of the U.S. armed forces who continue to protect the liberty of the American people in an ever more challenging world.

# Preface

**A Decade of Decline.** Ten years ago, The Heritage Foundation published the first edition of the *Index of U.S. Military Strength* to provide policymakers and the American people with a one-of-a-kind report card on how the U.S. military stacks up against a growing array of threats to America’s national security. Unfortunately, each successive edition has highlighted how increasing shortfalls in size and capability have left our military weaker.

The American people rely on the federal government to keep them safe in a dangerous world, but a decade of distraction and complacency has left U.S. armed forces in a diminished state. Article One, Section Eight of the Constitution lists 17 separate powers that are granted to the Congress. Six of those powers deal exclusively with the national defense—far more than any other area of governance—and grant the full range of authorities necessary for the nation’s defense. That awesome responsibility must be applied to the restoration of the military that protects our citizens, safeguards our liberty, and preserves our way of life.

U.S. political leaders cashed in on the “peace dividend” after the Cold War and then used President Reagan’s military buildup to fight never-ending wars in the Middle East that contributed to the breakdown of the American people’s trust in our military leaders. This combination, along with Defense budget cuts in the 1990s, exhausted our armed forces and left them weakened as equipment aged and force structure was reduced. Today, the military is a shadow of the force that stood guard against the Soviets, not just in size, but more importantly in capabilities and readiness. We are experiencing the third recruiting crisis in the history of the all-volunteer force, which threatens to leave significant shortfalls in our formations and further degrade readiness. Given the threats we face from Europe to the Middle East to the Pacific, if America intends to remain a global force in the 21st

century, Congress and the Pentagon need to take our security more seriously.

Our number one adversary, the People’s Republic of China (PRC), certainly takes security seriously. Each year, the Chinese Communist Party (CCP) continues to expand its military capabilities to back evil ideology with steel. As The Heritage Foundation determined earlier this year, we have entered a “New Cold War” with China across the full spectrum of competition that includes the economic, diplomatic, and military spheres. The Chinese seek hegemony in the Indo-Pacific. If they succeed, they will control U.S. access to Asia’s vital markets with dire implications for Americans’ security, prosperity, and freedom. No other country poses a threat to U.S. interests of this magnitude.

Denying China’s imperial ambitions is only growing more difficult. The Chinese are driven and dedicated. Over the past 20 years, they have poured resources into building a military that is increasingly capable of challenging our own. Every year, China builds and commissions more ships to counter the U.S. Navy, especially in the South China Sea. Its navy is now the largest in the world. Meanwhile, China’s air and space forces are improving steadily as are its nuclear forces, which are in the midst of an unprecedented expansion. Gone are the days when the U.S. assumed supremacy over the Chinese military—and time is not on our side. CCP General Secretary Xi Jinping has openly directed the People’s Liberation Army to prepare to seize Taiwan by 2027. We must move quickly if we are to deter Chinese aggression in the dangerous years ahead having learned the lesson that the failure to preserve deterrence in Europe resulted in the disastrous Russian invasion of Ukraine—not to mention the failure to preserve deterrence against the Islamic Republic of Iran in the Middle East, which resulted in the spectacularly horrific Hamas terrorist attack on Israel.

Unfortunately, some of the politically motivated leaders of the United States military do not seem to share this sense of urgency. Instead, they seem more focused on promoting progressive domestic priorities than on preparing to deter or, if necessary, prevail against China or other threats to U.S. vital interests. Under the Biden Administration, Department of Defense (DOD) officials who pursue a woke agenda or approve abortion on demand for service-women are the ones who receive promotions. With drag queen recruiting ads and a focus on shaping the military culture to mirror woke utopian visions or seeking to use the DOD to counter the allegedly primary “national security threat” of global warming, one must wonder whether our leaders are seeing the same threats from the outside world that The Heritage Foundation sees.

The Biden Administration has abandoned its responsibility to preserve our borders, and the resultant crisis threatens our sovereignty. Worse, we are diverting critical resources to house and sustain illegal immigrants, spending twice what we commit to our servicemembers and their families’ housing. Russia’s invasion of Ukraine and Hamas’s attack on Israel, as well as the ever-present threat of a Chinese invasion of Taiwan, should be wakeup calls. Armed conflict among the great powers is not a thing of the past. Great-power competition is here to stay, and we must be ready—not just so we can win a war but, God willing, to deter armed conflict from ever happening.

Our political leaders must ensure that the military focuses on countering these threats while also

recognizing the dire state of our financial situation here at home. U.S. fiscal resources are not unlimited. America is torn between the need to defend itself and the need to remain fiscally viable. Failure in either category is not acceptable. Congress and our leaders in the Pentagon must work together to cancel wasteful programs, cut unnecessary infrastructure, and ensure that available resources fund the highest-priority national security issues. Even then, however, we cannot expect to spend our way out of the problems facing our nation’s military today—so we must prioritize. This is the essence of strategy, and doing so will no doubt require tough decisions and leadership. But true patriots do not shy away from hard problems. They attack them head on.

America needs a strong military so the American people can live peacefully in a dangerous world. If we want our children and grandchildren to grow up free, safe, and prosperous, U.S. political leaders must step up to the plate and deliver. From the dawn of our Republic, we have depended on the service and sacrifice of our fellow citizens committed to bearing arms in defense of our families, homes, ideals, and this nation. That call has never gone unanswered. Our commitment to those that have given that last full measure of devotion must ensure that we never fail to honor their devotion and ensure a strong national defense.

Kevin Roberts, PhD, President  
The Heritage Foundation  
November 2023

# Introduction

For much of the preceding century, American power has preserved our liberty and served as the principal deterrent to aggression. Our historic economic power has financed a military that has served as the shield under which the tools of diplomacy, trade, and engagement have produced unprecedented progress and peace. After decades of neglect, however, the shield is cracking. America's global influence is being surrendered and reversed, threatening global peace and stability, and our homeland is no longer immune from external threat.

The United States maintains a military force primarily to protect the homeland from attack and to protect its interests abroad. Other uses—assisting civil authorities in times of emergency, for example, and maintaining the perception of combat effectiveness to deter enemies—amplify other elements of national power such as diplomacy or economic initiatives, but America's armed forces exist above all else so that the U.S. can physically impose its will on enemies and change the conditions of a threatening situation by force or the threat of force.

The Heritage Foundation's *Index of U.S. Military Strength* gauges the ability of America's military to perform its missions in 2023 and assesses how the military's condition has changed during the preceding year. The *Index* is not meant either to predict what the U.S. military might be able to do in the future or to accord it efficacy today based on the promise of new technologies that are in development rather than fielded and proven in use. It is a report to American citizens on the status of the military that they join, that they support, and on which they depend.

The United States prefers to lead through “soft” elements of national power—diplomacy, economic incentives, and cultural exchanges—but soft power cannot ultimately substitute for raw military power. When soft approaches such as diplomacy work,

their success often owes much to the knowledge of all involved that U.S. “hard power” stands ready, however silently, in the background. In similar fashion, countries seek an economic relationship with the United States because of the strength of the U.S. economy and the country's perceived long-term viability and stability. All are predicated on America's ability to protect itself, safeguard its interests, and render assistance to its allies—all of which depends on a competent, effective, and commensurately sized military. As Frederick the Great (1712–1786) observed, “Diplomacy without arms is like music without instruments.”

Soft approaches cost less in manpower and treasure than military action costs and do not carry the same risk of damage and loss of life, but when the United States is confronted by physical threats to its national security interests, it is the hard power of its military that carries the day. In fact, the absence of military power or the perception that hard power is insufficient to protect critical interests will frequently—and predictably—invite challenges that soft power simply cannot address. Thus, hard power and soft power are complementary and mutually reinforcing. An insufficiency of either damages the other and ultimately jeopardizes the country's future.

The decline of America's military hard power, historically shown to be critical to defending against major military powers and to sustaining operations over time against lesser powers or in multiple instances simultaneously, is thoroughly documented and quantified in this *Index*. It is harder to quantify the growing threats to the U.S. and its allies that are engendered by the perception of American weakness abroad and doubts about America's resolve to act when its interests are threatened.

The anecdotal evidence is consistent with direct engagements between Heritage scholars and

high-level diplomatic and military officials from countries around the world: The aging and shrinking of America's military forces, their reduced presence in key regions since the end of the Cold War, and various distractions created by America's domestic debates have created a perception of American weakness that contributes to destabilization in many parts of the world, prompts old friends to question their reliance on America's assurances, and spurs them to expand their own portfolio of military capabilities or to seek other alliances with stronger partners.

While strong allies with close ties to America are a boon for U.S. security and prosperity, partners that are less well integrated into the U.S. security umbrella reflect the decline of U.S. influence in regional affairs. Policy decisions made by Saudi Arabia and Turkey over the past year or two, for example, to strengthen economic, military, and diplomatic ties with China and Russia, respectively, serve to illustrate this reality. Countries will take steps to secure their interests, regardless of U.S. desires, if they perceive that relations with powers other than the U.S. best serve those interests. For decades, the perception of American strength and resolve has helped to deter adventurous bad actors and tyrannical dictators and has supported a global network of U.S. allies and partners. Regrettably, both that perception and, as a consequence, its deterrent and reassuring effects are eroding.

Recognition of this problem is growing in the U.S. and was forcefully addressed in the 2018 National Defense Strategy (NDS),<sup>1</sup> which called for a renewal of America's military power. However, spending on defense must be commensurate with the interests that the military is called upon to protect, and there continues to be a significant—even growing—gap between the two.

The current NDS, released in March 2022,<sup>2</sup> did little to allay concerns about this gap or to provide any meaningful detail on how the Department of Defense (DOD) would focus its energies to close the gap by setting goals, establishing and implementing strategies, or modifying its forces so that defense budget requests included a compelling rationale. Further, a bipartisan compromise<sup>3</sup> to eliminate the national debt ceiling through January 1, 2025, provided for a 3.3 percent increase in defense spending for fiscal year (FY) 2024 and a mere 1 percent increase for FY 2025 while inflation hovers around

6 percent, effectively reducing the military's ability to make any progress in modernization, capacity, or readiness. Meanwhile, America's allies, with a few notable exceptions, continue to underinvest in their military forces, and the United States' chief competitors are hard at work improving their own.

### **An Increasingly Dangerous World**

The result is an increasingly dangerous world threatening a weaker America. This might seem odd to many observers because U.S. forces have dominated the battlefield in tactical engagements with enemy forces over the past 30 years. Not surprisingly, the forces built to battle those of the Soviet Union have handily defeated the forces of Third World dictators and terrorist organizations. These military successes, however, are quite different from lasting political successes and have masked the deteriorating condition of America's military, which has been able to undertake such operations only by "cashing in" on investments made in the 1980s and 1990s.

Unseen by the American public, the consumption of our military readiness has not been matched by corresponding investments in replacements for the equipment, resources, and capacity used up since September 11, 2001, in places such as Iraq, Afghanistan, and Syria. As of late July 2023, U.S. support for Ukraine had consumed an additional \$44 billion of military equipment and ammunition<sup>4</sup> taken directly from existing stores, reducing the resources that would be available to U.S. forces in the event of another conflict and making it necessary to replenish them in the future.

It is therefore critical that we understand the condition of the United States military with respect to America's vital national security interests, the threats to those interests, and the context within which the U.S. might have to use hard power. It is likewise critically important to grasp how these three areas—operating environments, threats, and the posture of the U.S. military—change over time, given that such changes can have substantial implications for defense policies and investments.

The U.S. Constitution opens with a beautiful passage in which "We the People" state that among their handful of purposes in establishing that Constitution was to "provide for the common defence." The Constitution's enumeration of limited powers for the federal government includes both the powers of Congress "To declare War," "To raise



and support Armies,” “To provide and maintain a Navy,” “To provide for calling forth the Militia,” and “To provide for organizing, arming, and disciplining, the Militia” and the power of the President as “Commander in Chief of the Army and Navy of the United States, and of the Militia of the several States, when called into the actual Service of the United States.”

With such constitutional priority given to defense of the nation and its vital interests, one might expect the federal government to produce a standardized, consistent reference work on the state of the nation’s security. Yet no such single volume exists, especially in the public domain, to allow comparisons from year to year. In the past half-dozen years, the DOD has moved to restrict reporting of force readiness even further. Thus, the American people and even the government itself are prevented from understanding whether investments in defense are achieving their desired results.

What America needs is a publicly accessible reference document that uses a consistent, methodical, and repeatable approach to assessing defense requirements and capabilities. The Heritage Foundation’s *Index of U.S. Military Strength*, an annual assessment of the state of America’s hard power, fills this void, addressing both the geographical and functional environments that are relevant to our vital national interests and the threats that rise to a level that puts or has the strong potential to put those interests at risk.

Any assessment of the adequacy of military power requires two primary reference points: a clear statement of U.S. vital security interests and an objective requirement for the military’s capacity for operations that serves as a benchmark against which to measure current capacity. Top-level national security documents issued by a long string of presidential Administrations have consistently made clear that three interests are central to any assessment of national military power:

- Defense of the homeland;
- Successful conclusion of a major war that has the potential to destabilize a region of critical interest to the U.S.; and
- Preservation of freedom of movement within the global commons: the sea, air, outer space,

and cyberspace domains through which Americans conduct their business.

Every President has recognized that protecting America from attack is one of the U.S. military’s fundamental reasons for being. Going to war has always been controversial, but the decision to do so has been based consistently on the conclusion that not going to war would leave the country more vulnerable to attack.

This *Index* embraces the requirement that the U.S. military should be able to handle two major wars or two major regional contingencies (MRCs) successfully at the same time or in closely overlapping time frames as the most compelling rationale for sizing U.S. military forces. The new cold war with China<sup>5</sup> in which we find ourselves requires a force construct preserved until the close of the last one. The basic argument is this: The nation should have the ability to engage and defeat one opponent and still have the ability to prevent another opponent from exploiting the perceived opportunity to move against U.S. interests while America is engaged elsewhere. It is also vital to retain flexibility, because no attribute is applied in war more universally than uncertainty is.

The *Index* is descriptive, not prescriptive: It reviews the current condition of its subjects within the assessed year and describes how conditions have changed from the previous year, informed by the baseline condition established by the inaugural *2015 Index*.<sup>6</sup> In short, the *Index* answers the question, “Have conditions improved or worsened during the assessed year?”

This study also assesses the U.S. military against the two-war benchmark and various metrics that are explained further in the military capabilities section. Importantly, the *Index* measures the hard power needed to win conventional wars rather than the general utility of the military relative to the breadth of tasks it might be (and usually is) assigned to perform in order to advance U.S. interests short of war.

The authors recognize that advances in technology can translate into new military capabilities, but technology should not be seen as a panacea for all that ails the U.S. military. New tools, platforms, and weapons prompt some observers to assume that older capabilities can be replaced easily by new ones, often in reduced numbers, or that the current force

will inevitably be transformed in ways that make it decisively better than that of an opponent. Typically missing in these optimistic assessments of what the future military might then be able to do is a corresponding recognition that competitors quickly adopt similar technological advances in their own militaries or that the new capability might not be as effective as we believed it would be during its development.

The current war in Ukraine offers compelling evidence of this. Although new technologies—unmanned aerial vehicles, anti-armor guided munitions, cyberwarfare—are on display in abundance, “old school” weaponry such as artillery, rockets, and automatic weapons has proven to be devastatingly effective. The war also serves as a reminder that capacity in people, equipment, munitions, and various supplies is essential to sustained operations, as is the ability to rapidly reconstitute losses. And the savage Iranian-sponsored October 7, 2023, Hamas terrorist attack on Israel demonstrates that even one of the world’s most high-tech countries can be vulnerable to low-tech methods such as paragliders, tunnels, and written communications that evade electronic surveillance.

The historical record of war shows repeatedly that new technologies convey temporary advantages: The force that wins is usually the one that is best able to sustain operations over time, replace combat losses with fresh forces and equipment, and use its capabilities in novel ways that account for the enemy, terrain, time, and achievable objectives. This reality has led the authors to return consistently to an appreciation of the force’s capacity, the modernity of its capabilities, and its readiness for close combat with an equally capable and competent enemy. Consequently, this *Index* continues to emphasize the importance of the two-war force sizing benchmark and the need to ensure that the current force is ready for war and materially capable of winning in hard combat in real rather than imagined worlds.

### **Assessing the World and the Need for Hard Power**

The assessment portion of the *Index* is composed of three major sections that address the aforementioned areas of primary interest: the operating environments within or through which America’s military must be employed, threats to U.S. vital national interests, and the U.S. military services themselves.

For each of these areas, the *Index* provides context by explaining why a given topic is addressed and how it relates to understanding the nature of America’s hard-power requirements.

The authors of this study used a five-category scoring system that ranges from “very poor” to “excellent” or “very weak” to “very strong” as appropriate to each topic. This approach is the best way to capture meaningful gradations while avoiding the appearance that a high level of precision is possible given the nature of the issues and the information that is publicly available.

Some factors are quantitative and lend themselves to discrete measurement. Others are inherently qualitative in nature and can be assessed only through an informed understanding of the material that leads to an informed judgment.

By themselves, purely quantitative measures tell only part of the story when it comes to hard power’s relevance, utility, and effectiveness. Using only quantitative metrics to assess military power or the nature of an operating environment can lead to misinformed conclusions. For example, the mere existence of a large fleet of very modern tanks has little to do with the effectiveness of the armored force in actual battle if the employment concept is irrelevant to modern armored warfare. (Imagine, for example, a battle in rugged mountains.) Also, experience and demonstrated proficiency are often so decisive in war that numerically smaller or qualitatively inferior but well-trained and experienced forces can defeat a larger or qualitatively superior adversary that is inept or poorly led. Again, the differing performance of Russian and Ukrainian troops is illuminating, and countries like China are taking note.

The world is still very much a qualitative place, however digital and quantitative it might appear to have become thanks to the explosion of advanced technologies, and judgments have to be made in the absence of certainty. We strive to be as objective and evenhanded as possible in our approach and as transparent as possible in our methodology and sources of information so that readers can understand why we reach the conclusions we reach—and perhaps reach their own as well. The result will be a more informed debate about what the United States needs in terms of military capabilities to deal with the world *as it is*. A detailed discussion of scoring is provided in each assessment section.

In our assessment, we begin with the operating environment because it provides the geostrategic stage upon which the U.S. attends to its interests:

- The various states that would play significant roles in any regional contingency;
- The terrain that enables or restricts military operations;
- The infrastructure—ports, airfields, roads, and rail networks (or lack thereof)—on which U.S. forces would depend; and
- The types of its linkages and relationships with a region and major actors within it that cause the U.S. to have interests in the area or that facilitate effective operations.

Major actors within each region are identified, described, and assessed in terms of alliances, political stability, the presence of U.S. military forces and relationships, and the maturity of critical infrastructure.

Our assessment focuses on three key regions—Europe, the Middle East, and Asia—because of their importance relative to U.S. vital security, economic, and diplomatic interests. This does *not* mean that we view Latin America and Africa as unimportant. It means only that currently, the security challenges within these regions do not directly threaten America’s vital interests as we have defined them. We addressed their condition in the *2015 Index*<sup>7</sup> and will provide updated assessments when circumstances make such reassessments necessary.

Next comes a discussion of threats to U.S. vital interests. Here we identify the countries and non-state actors that are the greatest current or potential threats to U.S. vital interests based on two overarching factors: behavior and capability. We accept the classic definition of “threat” as a combination of intent and capability, but while capability has attributes that can be quantified, intent is difficult to measure. We concluded that “observed behavior” serves as a reasonable surrogate for intent because it is the clearest manifestation of intent.

We based our selection of threat countries and non-state actors on their historical behavior and explicit policies or formal statements vis-à-vis U.S. interests, scoring them in two areas: the degree of

provocative behavior that they exhibited during the year and their ability to pose a credible threat to U.S. interests regardless of intent. For example, a state full of bluster but with only a moderate ability to act accordingly poses a lesser threat, and a state with great capabilities and a record of bellicose behavior that is opposed to U.S. interests warrants attention even if it is relatively quiet in a given year. The combination of behavior and ability to pose a credible threat eliminates most smaller terrorist, insurgent, and criminal groups and many problematic states because they do not have the ability to challenge America’s vital national interests successfully.

Finally, we address the status of U.S. military power in three areas: capability (or modernity), capacity, and readiness. To do this, we must answer three questions:

- Do U.S. forces possess operational capabilities that are relevant to modern warfare?
- Do they have a sufficient quantity of such capabilities?
- Is the force sufficiently trained to win in combat, and is its equipment materially ready?

Presumably, if the answer to all three questions is “yes,” the U.S. military would be able to defeat the military force of an opposing country.

All of these are fundamental to success even if they are not de facto determinants of success. Turning again to the Russia–Ukraine War for an illustrative example, Russia’s advantages in capacity, modernity, and assumed readiness (as was likely reported by Russian commanders to their national leadership) have not translated into the victory expected by Moscow, but it is likely safe to assume that Russian President Vladimir Putin would not have embarked on the war without such advantages. Ukraine would certainly not have withstood the assault as well as it has without support from other countries that made up for deficiencies in these same areas.

We also address the condition of the U.S. nuclear weapons capability, assessing it in areas that are unique to this military component and critical to understanding its real-world viability and effectiveness as a strategic deterrent, and provide a descriptive overview of current U.S. missile defense capabilities and challenges.

However, the *Index* does not assess (score) U.S. cyber and missile defense capabilities. There are as yet no viable metrics by which to measure the capacity, capability, or readiness of these elements of national defense, their constituent service components, and elements of the government that contribute to activities in these domains, and it is not yet clear how one would assess their roles in measuring “hard combat power,” which is the focus of this publication. A thorough assessment will have to be part of a future *Index*. However, we do provide overviews of each functional capability, explaining to the reader the capability as it is currently constituted and aspects of its function and contribution.

### Topical Essays

Each edition of the *Index* provides the opportunity to share with readers authoritative insights into issues that affect U.S. military power. Past editions have included essays on logistics, alliances, experimentation, the spectrum of conflict and the domains in which forces operate, and special operations forces, among many other subjects. There is a lot of shaft that makes the pointed end of a spear effective, and we endeavor to explain what this means with these essays.

In this edition, we are pleased to share the work of authors who address various trends related to the ability of the United States to defend itself and its interests.

- The Heritage Foundation has been producing the *Index of U.S. Military Strength* for a decade, this edition being the tenth. What insights do 10 years of assessments generate regarding the status of U.S. military power, the ability of allies to contribute to mutually beneficial security matters, and the evolution of threats as they relate to such interests? The originator and editor of the *Index*, Dakota Wood, takes a stab at drawing such insights from the work of a great number of contributors in his essay, “*The Index of U.S. Military Strength: Ten Years in Review*.”
- Dr. James Carafano reminds us of the U.S. military’s history in rallying to the cause of national defense and how its composition and contributions to America as well as its actions serve much more than purely physical security interests. His essay, “*The Role of the Military in U.S. History: Past, Present, and Future*,” is a must-read reminder of just how intertwined America’s military is with the strength of the country not just in military power, but also in stability and the health of its economy, political system, and cultural life.
- Dr. Anna Simons contributes a compelling story from the other side of the civil–military relationship. In “*The Military and Society: A Refresher*,” she addresses societal, cultural, and popular attitudinal matters from a very personal point of view. As a long-practicing social anthropologist who has worked with the military community for decades, especially the special operations community, Dr. Simons shares her considerable insights into societal factors that affect and are affected by the U.S. military.
- The ongoing war in Ukraine serves as a painful reminder of war’s ravenous appetite for equipment and ammunition (in addition to the terrible toll it takes in human lives) as defenders and aggressors churn through their inventories of each in often-desperate attempts to achieve their objectives. Maiya Clark, in “*The U.S. Defense Industrial Base: Past Strength, Current Challenges, and Needed Change*” provides a brief history of America’s defense industrial base and then examines vulnerabilities, risks, and attendant matters of procurement and acquisition as they relate to America’s ability to produce the material needed for defense.
- Intimately related to defense production are the willingness, ability, and need to invest in military power, a topic Frederico Bartels embraces in “*Understanding the Defense Budget*.” There has always been an ebb and flow in funding for defense; it increases when dangers clearly threaten and falls off when peace reigns, especially the farther one gets from a time of conflict. When debates over defense spending occur, they often take place without any real understanding of what the defense budget is. Bartels provides an excellent primer.

## Scoring U.S. Military Strength Relative to Vital National Interests

The purpose of this *Index* is to make the national debate about defense capabilities better informed by assessing the U.S. military's ability to defend against current threats to U.S. vital national interests within the context of the world as it is. Each of the elements considered—the stability of regions and access to them by America's military forces; the various threats as they improve or lose capabilities and change their behavior; and America's armed forces themselves as they adjust to evolving fiscal realities and attempt to balance readiness, capacity (size and quantity), and capability (how modern they are) in ways that enable them to carry out their assigned missions successfully—can change from year to year.

Each region of the world has its own set of characteristics that include terrain; man-made infrastructure (roads, rail lines, ports, airfields, power grids, etc.); and states with which the United States has relationships. In each case, these factors combine to create an environment that is either favorable or problematic when it comes to the ability of U.S. forces to operate against threats in the region.

Various states and non-state actors within these regions possess the ability to threaten—and have behaved consistently in ways that do threaten—America's interests. Fortunately for the U.S., these major threat actors are few in number and continue to be confined to three regions—Europe, the Middle East, and Asia—thus enabling the U.S. (if it will do so) to focus its resources and efforts accordingly. Unfortunately, however, when one of these major threat actors does something outrageous as Russia did by invading Ukraine or Iran did by sponsoring the Hamas attack on Israel, the damage is not confined to the immediate region.

In our globally interconnected world, local wars can have global consequences that lead to severe economic, diplomatic, and security problems for the U.S., its allies, and its trading partners. Russia's assault on Ukraine has sent shocks throughout energy and food markets, causing severe shortages and spikes in costs for nearly every country. One can only imagine the catastrophe that would result if China decided to seize Taiwan or use force to take control of disputed islands or if Iran's acquisition of a nuclear weapons capability prompted Israel to confront Tehran directly. The question that looms

large in any of these scenarios is both simple and fundamental: Is the U.S. military up to the task of defending America's interests?

America's military services are beset by aging equipment, shrinking numbers, rising costs, and problematic funding. These four elements interact in ways that are difficult to measure in concrete terms and impossible to forecast with any certainty. Nevertheless, the exercise of describing them and characterizing their general condition is worthwhile because it informs debates about defense policies and the allocation of resources that are necessary if the U.S. military is to carry out its assigned duties. Further, as seen in this *2024 Index*, noting how conditions have changed during the preceding year helps to shed light on the effects of policies, decisions, and actions on security affairs that involve the interests of the United States, its allies and friends, and its enemies.

It should be borne in mind that each annual *Index* assesses conditions as they are for the year in question. This *2024 Index of U.S. Military Strength* describes changes that occurred during the preceding year with updates that are current as of October 2023.

Assessments for global operating environment, threats to vital U.S. interests, and U.S. military power are included in the Executive Summary. Factors that would push things toward “bad” (the left side of the scale) tend to move more quickly than those that improve one's situation, especially when it comes to the material condition of the U.S. military. Munitions can be expended in seconds, and an airplane or a tank can be lost in an instant. Replacing either takes months or years. Similarly, wars unfold at a breakneck pace and can last weeks, months, or years, but their aftermath can extend decades into the future, changing the geopolitical and global economic landscapes in ways that cannot be undone.

Of the three areas measured—global operating environment, threats to vital U.S. interests, and U.S. military power—the U.S. can directly control only one: its own military. The condition of the U.S. military can influence the other two because a weakened America arguably emboldens challenges to its interests and loses potential allies, but a militarily strong America deters opportunism and draws partners to its side from across the globe.

## Conclusion

During the decades since the end of the Second World War, the United States has underwritten and taken the lead in maintaining an unprecedented period of peace that has benefited more people in more ways than at any other period in history. Now, however, that American-led order is arguably under the greatest stress since its founding, and some wonder whether it will break apart entirely as fiscal and economic burdens (exacerbated by disruptions like the COVID-19 pandemic, the Russia–Ukraine War, and the attack on Israel) plague nations, violent extremist ideologies threaten the stability of entire regions, competition for scarce resources increases, state and non-state opportunists seek to exploit upheavals, technological innovations in telecommunications and artificial intelligence present opportunity and risk in equal measure, and major states compete to establish dominant positions in their respective regions.

America’s leadership role is very much in question, and its security interests are under substantial pressure. Challenges continue to grow, long-standing allies are not what they once were, and the U.S. is increasingly bedeviled by once-unimaginable debt and domestic discord that constrain its ability to sustain its forces at a level that is commensurate with its interests.

The deterioration of our national defense can still be arrested and reversed, but this will require concerted effort to fulfill our obligations, regain our confidence, restore our armed forces, and preserve the economic strength responsible for sustaining it. If not, the developments that we are observing in

the Korean peninsula, Iran, Russia, China, the Middle East, Afghanistan, Africa, and Central Europe will constitute the “first foretaste of [the] bitter cup which will be proffered to us year by year” to which Churchill referred after Munich in 1938 “unless by a supreme recovery of moral health and martial vigor, we arise again and take our stand for freedom as in the olden time.”

The crisis we confront is not unprecedented. Following the conclusion of the Vietnam conflict and American withdrawal, the Defense Department launched an effort led by Andrew Marshall and the Office of Net Assessment under the direction of then-Secretary of Defense Donald Rumsfeld<sup>8</sup> to assess the Soviet Union’s growing military forces and compare their force structure and capabilities to ours. The Congressional Research Service<sup>9</sup> conducted a parallel effort to contrast the growing divergence and provide a range of urgent recommendations to Congress. Both projects concluded that we were unprepared to meet current and projected Soviet military threats and that, absent the development of new and improved capabilities, deterrence would likely collapse, security would be threatened, and our national interests would be compromised. The Reagan Administration worked with Congress to address the challenges, and our military advantage was restored, contributing decisively to the successful conclusion of the Cold War.

Informed deliberations on the status of America’s military power are therefore desperately needed. It is our hope, as always, that this *Index of U.S. Military Strength* will help to facilitate those deliberations.

## Endnotes

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# Executive Summary

*As currently postured, the U.S. military is at significant risk of not being able to defend America's vital national interests. This is the inevitable result of years of prolonged deployments, underfunding, poorly defined priorities, wildly shifting security policies, exceedingly poor discipline in program execution, and a profound lack of seriousness across the national security establishment even as threats to U.S. interests have surged. In 2023, this has been compounded by the cost of U.S. support for Ukraine's defense against Russia's assault, which is further exacerbated by the limited willingness of allies in Europe to shoulder a greater share of the burden. The war has laid bare the limited inventories of equipment, munitions, and supplies of all supporting countries as well as the limitations of the industrial base that will be required to replenish them.*

The United States maintains a military force to protect the homeland from attack and to safeguard its interests abroad. There obviously are other uses—for example, to assist civil authorities in times of emergency or to deter enemies—but this force's primary purpose historically has been to make it possible for the U.S. to physically impose its will on an enemy in defense of our nation and its vital interests.

It is therefore critical that the American people understand the condition of the United States military with respect to America's vital national security interests, threats to those interests, and the context within which the U.S. might have to use “hard power” to protect them. Because changes can have substantial implications for defense policies and investment, knowing how these three areas change over time is likewise important. Of the three, however, the condition of the military is the one that we most need to understand because it is *the only one*

over which the U.S. has complete control, and it underwrites the ability of all other aspects of national power to flourish or fail.

Each year, The Heritage Foundation's *Index of U.S. Military Strength* employs a standardized, consistent set of criteria, accessible both to government officials and to the American public, to gauge the U.S. military's ability to perform its missions in today's world. The inaugural 2015 edition established a baseline assessment on which each annual edition builds and that both assesses the state of affairs for its respective year and measures how key factors have changed during the preceding year. The current year can be compared to the initial year (2015) quite easily to see whether trends with respect to the U.S. military's ability to defend America's interests have been positive or negative.

The *Index* is not an assessment of what *might* be, although the trends that it captures may well imply both concerns and opportunities that can guide decisions that are germane to America's security. Rather, the *Index* should be seen as a report card for how well or poorly conditions, countries, and the U.S. military have evolved during the assessed year. The past cannot be changed, but it can inform the present, just as the future cannot be predicted but can be shaped.

## What the *Index* Assesses

The *Index of U.S. Military Strength* assesses the ease or difficulty of operating in key regions based on existing alliances, regional political stability, the presence of U.S. military forces, and the condition of key infrastructure. Assessments of threats are based on the behavior and physical capabilities of actors that pose challenges to vital U.S. national interests. The condition of America's military power is measured in terms of its capability or modernity, capacity for operations, and readiness to handle

assigned missions. This framework provides a single-source reference for policymakers and other Americans who seek to know whether our military is up to the task of defending our national interests.

Any discussion of the aggregate capacity and breadth of the military power needed to protect U.S. security interests requires a clear understanding of precisely what interests must be defended. Three vital interests have been specified consistently (albeit in varying language) by a string of Administrations over the past few decades:

- **Defense** of the homeland;
- **Successful conclusion** of a major war that has the potential to destabilize a region of critical interest to the U.S.; and
- **Preservation** of freedom of movement within the global commons (the sea, air, outer space, and cyberspace domains) through which the world conducts its business.

To defend these interests effectively on a global scale, the United States needs a military force of sufficient size: what is known in the Pentagon as capacity. The many factors involved make determining how big the military should be a complex exercise, but successive Administrations, Congresses, Department of Defense staffs, and independent commissions have managed to arrive at a surprisingly consistent force-sizing rationale: an ability to handle two major conflicts simultaneously or in closely overlapping time frames. The validity of this rationale is amply demonstrated by the experience gained from the actual use of America's military. As we find ourselves in a new cold war with China, it stands to reason that we need to restore the force structure that enabled the U.S. to prevail during the previous one with the Soviet Union.

At its root, the current National Defense Strategy (NDS) implies the same force requirement.<sup>1</sup> Its emphasis on a return to long-term competition with major powers, explicitly naming Russia and China as primary competitors, reemphasizes the need for the United States to have:

- Sufficient military capacity to deter or win against large conventional powers in geographically distant regions,

- The ability to conduct sustained operations against lesser threats, and
- The ability to work with allies and to maintain a U.S. presence in regions of key importance that is sufficient to deter behavior that threatens U.S. interests.

No matter how much America might wish that the world were a simpler, less threatening place, more inclined to beneficial economic interactions than to violence-laden friction, the patterns of history show that competing powers inevitably emerge and that the U.S. must be able to defend its interests in more than one region at a time. Russia's invasion of Ukraine, China's dramatic expansion of its military and its provocative behavior far beyond the Indo-Pacific region, North Korea's intransigence with respect even to discussing its nuclear capabilities, and Iran's dogged pursuit of a nuclear weapon capability and sustained support for terrorist groups illustrate this point. On October 7, 2023, Iranian-sponsored Hamas conducted a coordinated terrorist attack on Israel, claiming the lives of more than 1,400 Israelis and 33 Americans. This horrific attack marked the deadliest day in Israel's history and the deadliest terrorist attack on Americans since September 11, 2001. Two Carrier Strike Groups, an Amphibious Readiness Group, a number of U.S. Air Force squadrons, and theater missile defense systems have been deployed in an attempt to restore deterrence and prevent regional escalation.

Given this range of potential and actual threats to U.S. interests in multiple regions, and given the inability to predict when any one threat or multiple threats may materialize, this *Index* therefore embraces the two-war or two-contingency requirement so that America will have the ability to respond to an emergent threat while retaining the capacity to respond to a second.

Since its founding, the U.S. has been involved in a major "hot" war every 15–20 years.<sup>2</sup> Since World War II, the U.S. has also maintained substantial combat forces in Europe and other regions while simultaneously fighting major wars as circumstances demanded. The size of the total force roughly approximated the two-contingency model, which has the inherent ability to meet multiple security obligations to which the U.S. has committed itself while also modernizing, training, educating, and

maintaining the force. Accordingly, our assessment of the adequacy of today's U.S. military is based on the ability of America's armed forces to engage and defeat two major competitors at roughly the same time.<sup>3</sup>

We recognize that extended periods of peace and prosperity can lead to complacency and that without a dramatic change in circumstances such as the onset of a major conflict, a multitude of competing interests that evolve during such periods will cause Administrations and Congresses to spend more on domestic programs and less on defense. The results, unfortunately, are predictable: a weakened military, emboldened competitors, and a nation at risk. Winning the support needed to increase defense spending to the level that a force with a two-war capacity requires is admittedly difficult politically, but this does not change the patterns of history, the behavior of competitors, or the reality of what it takes to defend America's interests in an actual war.

This *Index's* benchmark for a two-war force is derived from a review of the forces used for each major war that the U.S. has undertaken since World War II, major defense studies completed by the federal government over the past 30 years, and the toll that extended use of military forces can exact even when the enemy is not a peer competitor. We conclude that a standing (Active Component) two-war-capable force would consist of:

- **Army:** 50 brigade combat teams (BCTs);
- **Navy:** 400 battle force ships and 624 strike aircraft;
- **Air Force:** 1,200 fighter/ground-attack aircraft;
- **Marine Corps:** 30 battalions; and
- **Space Force:** metric not yet established.

This recommended force does not account for homeland defense missions that would accompany a period of major conflict and are generally handled by Reserve and National Guard forces. Nor does it constitute the totality of the Joint Force, which includes the array of supporting and combat-enabling functions that are essential to the conduct of any military operation: logistics; transportation (land,

sea, and air); health services; communications and data handling; and force generation (recruiting, training, and education) to name only a few. Rather, these are combat forces that are the most recognizable elements of America's hard power but that also can be viewed as surrogate measures for the size and capability of the larger Joint Force.

## The Global Operating Environment

The United States is a global power, which means that it also has global security interests and requires a military that is able to protect those interests anywhere they are threatened. While this may occur in any region, three regions—Europe, the Middle East, and Asia—stand apart because of the scale and scope of U.S. interests associated with them and the significance of competitors that are able to pose commensurately large threats. Aggregating the three regional scores provides a global operating environment score of “favorable” in the *2024 Index*.

**Europe.** The duration of Russia's war on Ukraine, its mounting cost and savagery, and the questions it poses for the future of Europe, NATO, and individual countries have forced European governments and Europeans generally to reexamine their political dynamics, economic dependence on other countries, and ability to provide for their own domestic security interests.

In the *2023 Index*, we noted a strengthening in alliance relationships as NATO member countries conducted reviews of their respective military establishments and the ability of NATO, as a whole, to coordinate actions. NATO placed renewed emphasis on logistical matters and the extent to which it could respond to emergent crises.

During the past year, we have seen a galvanizing effect within political establishments that, while still dynamic within the domestic context of each country, appear generally to be more stable as countries take serious account of national matters that they have neglected since the end of the Cold War. Within specific countries, there are ongoing shifts between liberal and conservative governments, but the net result has been generally positive with respect to U.S. security interests, especially as countries commit to improving their defense capabilities, readiness, and postures. This has led us to increase Europe's score for political stability from “favorable” to “excellent.”

However, although America's relationships with European partners are generally sound and the

## Global Operating Environment: Summary

|           |             |          |           |           |
|-----------|-------------|----------|-----------|-----------|
| VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------|-------------|----------|-----------|-----------|

### Operating Environment: Europe

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             |          |           | ✓         |
| Political Stability   |           |             |          |           | ✓         |
| U.S. Military Posture |           |             |          | ✓         |           |
| Infrastructure        |           |             |          | ✓         |           |
| <b>OVERALL</b>        |           |             |          | ✓         |           |

### Operating Environment: Middle East

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             | ✓        |           |           |
| Political Stability   |           | ✓           |          |           |           |
| U.S. Military Posture |           |             | ✓        |           |           |
| Infrastructure        |           |             | ✓        |           |           |
| <b>OVERALL</b>        |           |             | ✓        |           |           |

### Operating Environment: Asia

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             |          | ✓         |           |
| Political Stability   |           |             | ✓        |           |           |
| U.S. Military Posture |           |             |          | ✓         |           |
| Infrastructure        |           |             |          | ✓         |           |
| <b>OVERALL</b>        |           |             |          | ✓         |           |

### Global Operating Environment

|                | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|----------------|-----------|-------------|----------|-----------|-----------|
| Europe         |           |             |          | ✓         |           |
| Middle East    |           |             | ✓        |           |           |
| Asia           |           |             |          | ✓         |           |
| <b>OVERALL</b> |           |             |          | ✓         |           |

political environment in many countries is healthy, the factors that quickly determine the ability of U.S. forces to operate are their positioning or presence on the continent and the physical infrastructure necessary to support military action. With these in mind, we score Europe as “favorable” for U.S. military activities should they be needed.

**The Middle East.** Efforts to integrate Iran into the region threaten regional stability, Israel’s security, and global markets. The convergence of threats encompasses an Iranian nuclear threshold state controlling a constellation of terrorist groups, resurgent non-state terrorist groups, and Russian and Chinese exploitation of a declining American presence. The United States risks the irrevocable loss of a favorable balance of both trade and forces and a resultant instability that threatens our vital national interests and the global economy. The October 7 attack on Israel and subsequent Iranian-sponsored attacks on U.S. forces in the region significantly enhance the risk of escalation. This risk represents an unprecedented range of challenges beyond our capacity and the capacity of our partners and allies to address threats to global energy and trade.

The Middle East is a vital component of the global economy. It accounts for 31 percent of global oil production, 18 percent of gas production, 48 percent of proven oil reserves, and 40 percent of proven gas reserves. Approximately 12 percent of global trade and 30 percent of global container traffic traverses the Suez Canal, transporting over \$1 trillion worth of goods each year. In 2018, the Middle East’s daily oil flow constituted approximately 21 percent of global petroleum consumption. But the region’s significance is not limited to energy. Sixteen of the submarine cables that connect Asia and Europe pass through the Red Sea.

While the United States may no longer be dependent on the region’s petroleum, the global economy is.<sup>4</sup> Beijing knows the Middle East is a vital source of the energy that fuels its economic growth and military; we cannot afford to ignore this critical vulnerability. China’s economy and military are exogenic, and this dependence resulted in the development of its Belt and Road Initiative (BRI) to obtain the resources it requires and sustain the routes that connect China to these resources.

Many of the borders in the region that were created after World War I are under significant stress.

In countries like Iraq, Lebanon, Libya, Syria, and Yemen, the supremacy of the nation-state is being challenged by non-state actors that wield influence, power, and resources comparable to those of small states. The region’s principal security and political challenges are linked to the unrealized aspirations of the Arab Spring, surging transnational terrorism, and meddling by Iran, which seeks to extend its influence in the Islamic world, to which must be added the Arab–Israeli conflict, Sunni–Shia sectarian divides, the rise of Iran’s Islamist revolutionary nationalism, and the proliferation of Sunni Islamist revolutionary groups. In addition, the China-brokered rapprochement between Iran and Saudi Arabia and Beijing’s regionwide infrastructure investments are a warning to U.S. policymakers that neglect of long-standing allies leaves behind power vacuums that America’s enemies are only too capable of exploiting to their own advantage.

We have relied on our incomparable ability to project power in response to crises, and many of our operations and contingency plans depend on the time-phased force deployment from the continental U.S. to operations theaters. This requires secure air and sea lanes of communication as well as secure air and sea bases of debarkation. Neither is assured in a theater conflict as Iran now possesses the ability to threaten three of the region’s strategic choke points (the Strait of Hormuz, Bab al-Mandeb, and the Suez Canal) as well as our bases and ports along the Arabian Sea within range of a growing and increasingly accurate Iranian ballistic missile inventory. Amir Ali Hajizadeh, commander of the Iran’s Islamic Revolutionary Guard Corps (IRGC) Aerospace Force, stated as recently as 2019 that “[e]verybody should know that all American bases and their vessels in a distance of up to two thousand kilometers are within the range of our missiles.”<sup>5</sup> As the U.S. largely located its bases to support operations before or after the 1991 conflict with Iraq, it would be helpful to consider establishing new infrastructure that is less vulnerable to Iranian missiles and drones and provides for a more efficient, layered defense. Our regional partners would welcome the initiative and could significantly defray costs.

The U.S. has acquired substantial operational experience in combatting regional threats. At the same time, however, many of America’s allies are constrained by political instability, economic

## Threats to U.S. Vital Interests: Summary



### Behavior of Threats

|                  | HOSTILE | AGGRESSIVE | TESTING | ASSERTIVE | BENIGN |
|------------------|---------|------------|---------|-----------|--------|
| China            |         | ✓          |         |           |        |
| Russia           | ✓       |            |         |           |        |
| Iran             |         | ✓          |         |           |        |
| North Korea      |         |            | ✓       |           |        |
| Non-State Actors |         | ✓          |         |           |        |
| <b>OVERALL</b>   |         | ✓          |         |           |        |

### Capability of Threats

|                  | FORMIDABLE | GATHERING | CAPABLE | ASPIRATIONAL | MARGINAL |
|------------------|------------|-----------|---------|--------------|----------|
| China            | ✓          |           |         |              |          |
| Russia           | ✓          |           |         |              |          |
| Iran             |            | ✓         |         |              |          |
| North Korea      |            | ✓         |         |              |          |
| Non-State Actors |            |           | ✓       |              |          |
| <b>OVERALL</b>   | ✓          |           |         |              |          |

### Threats to U.S. Vital Interests

|                  | SEVERE | HIGH | ELEVATED | GUARDED | LOW |
|------------------|--------|------|----------|---------|-----|
| China            |        | ✓    |          |         |     |
| Russia           |        | ✓    |          |         |     |
| Iran             |        | ✓    |          |         |     |
| North Korea      |        | ✓    |          |         |     |
| Non-State Actors |        | ✓    |          |         |     |
| <b>OVERALL</b>   |        | ✓    |          |         |     |

problems, internal security threats, and mushrooming transnational threats. Although the region’s overall score remains “moderate” as it was last year, it is in danger of falling to “poor” because of political instability and growing bilateral tensions with

allies over the security implications of the proposed nuclear agreement with Iran and how best to fight the Islamic State.

With this in mind, we score the Middle East region as “moderate” relative to the ability of U.S.

forces to operate in defense of America's national interests.

**Asia.** The Asian strategic environment is extremely expansive. It includes half the globe and is characterized by a variety of political relationships among states that possess widely varying capabilities. The region includes American allies with relationships dating back to the beginning of the Cold War as well as recently established states and some long-standing adversaries such as the People's Republic of China and North Korea.

American conceptions of the region must therefore recognize the physical limitations imposed by the tyranny of distance. Moving forces within the region (to say nothing of moving them to it) will take time and require extensive strategic lift assets as well as sufficient infrastructure (such as sea and aerial ports of debarkation that can handle American strategic lift assets) and political support. At the same time, the complicated nature of intra-Asian relations, especially unresolved historical and territorial issues, means that the United States, unlike Europe, cannot necessarily count on support from all of its regional allies in responding to any given contingency.

The militaries of Japan and the Republic of Korea are larger and more capable than European militaries, and both countries have a sustained interest in developing missile defense capabilities that will be essential in combatting the regional threat posed by North Korea. In Japan, the public continues to express awareness of and more interest in the need to adopt a more "normal" posture militarily in response to China's increasingly aggressive actions; this indicates a break with the pacifist tradition that has characterized the Japanese since the end of World War II.

We continue to assess the Asia region as "favorable" to U.S. interests in terms of alliances, overall political stability, militarily relevant infrastructure, and the presence of U.S. military forces.

Summarizing the condition of each region enables us to get a sense of how they compare in terms of the difficulty that would be involved in projecting U.S. military power and sustaining combat operations in each one. As a whole, the global operating environment maintains a score of "favorable," which means that the United States should be able to project military power anywhere in the world to defend its interests without substantial opposition

or high levels of risk other than those imposed by a capable enemy.

### Threats to U.S. Interests

America faces challenges to its security at home and interests abroad from countries and organizations that have:

- Interests that conflict with those of the United States;
- Hostile intentions toward the U.S.; and
- In some cases, growing military capabilities that are leveraged to impose an adversary's will by coercion or intimidation of neighboring countries, thereby creating regional instabilities.

The government of the United States constantly faces the challenge of employing the right mix of diplomatic, economic, public information, intelligence, and military capabilities to protect and advance its interests. Because this *Index* focuses on the military component of national power, its assessment of threats is correspondingly an assessment of the military or physical threat posed by each entity addressed in this section. Admittedly, military power undergirds or backstops other elements of national power, but economic or diplomatic efforts cannot defeat an armored division or a missile barrage: When other instruments fail, military power is the only means by which to defeat physical attacks that threaten core U.S. interests.

**China** presents the United States with its most comprehensive and daunting national security challenge across all three areas of vital American national interests: the homeland; regional war (including potential attacks on overseas U.S. bases as well as against allies and partners); and international common spaces. China is challenging the U.S. and its allies at sea, in the air, and in cyberspace. It has sparked deadly confrontations on its border with India and poses a standing and escalating threat to Taiwan.

The Chinese military can no longer be viewed as a distant competitor. China has begun to field indigenous aircraft carriers and advanced missile technology. It is rapidly expanding its nuclear arsenal and conducting live-fire exercises and mock

blockades around Taiwan. If current trends persist, the gap between the Chinese and U.S. militaries will likely narrow further, and the idea that China might surpass U.S. capabilities in some fields will seem far less implausible.<sup>6</sup>

This *Index* assesses the overall threat from China, considering the range of contingencies, as “aggressive” for level of provocative behavior and “formidable” for level of capability.

Although **Russia** has the military capability to harm and (in the case of its nuclear arsenal) to pose an existential threat to the U.S., it has not yet conclusively demonstrated the intent to do so. Nevertheless, especially in view of its war against Ukraine, Russia remains a significant threat to America’s interests and allies in the European region.

Russia may not be the threat to U.S. global interests that the Soviet Union was during the Cold War, but it does pose challenges to a range of America’s interests and those of its allies. It continues its efforts to undermine the NATO alliance and presents an existential threat to U.S. allies in Eastern Europe. It also still maintains the world’s largest nuclear arsenal, and although a strike on the U.S. is highly unlikely, the latent potential for such a strike still gives these weapons enough strategic value vis-à-vis America’s NATO allies and interests in Europe to ensure their continued relevance.

In addition, although Russia has expended much of its arsenal of munitions and has suffered significant losses in its war against Ukraine, the decision by several countries to continue trading with Russia despite sanctions placed on the country has provided a steady flow of funds into Russia’s accounts that Putin can use to support his aggression. Russia therefore remains a significant security concern for the U.S., its NATO partners, and other allies.

For these reasons, the *Index* continues to assess the threat from Russia as “hostile” for level of provocative behavior and “formidable” for level of capability.

**Iran** represents by far the most significant security challenge to the United States, its allies, and its interests in the greater Middle East. Its open hostility to the United States and Israel, sponsorship of terrorist groups, and history of threatening the commons underscore the problem. Today, Iran’s provocations are mostly a concern for the region and America’s allies, friends, and assets there. Iran relies heavily on irregular (to include political)

warfare against others in the region, and the number of ballistic missiles fielded by Iran is greater than the number fielded by any of its neighboring countries. The development of its ballistic missiles and threshold nuclear capability also make Iran a significant long-term threat to the security of the U.S. homeland.<sup>7</sup>

This *Index* therefore assesses the overall threat from Iran, considering the range of contingencies, as “aggressive” for level of provocative behavior. Iran’s capability score holds at “gathering.”

**North Korea’s** nuclear and missile forces represent its greatest military threat to the United States. Its naval and air forces would not be expected to last long in a conflict with South Korea and the U.S., but they would have to be accounted for in any defense by South Korea. Pyongyang’s ground forces are largely equipped with older weapons, but they also are extensive and forward-deployed. Thousands of artillery systems deployed near the demilitarized zone could inflict devastating damage on South Korea, especially Seoul, before allied forces could attrite them.

Greater North Korean nuclear capabilities could undermine the effectiveness of existing allied military plans and exacerbate growing allied concerns about Washington’s willingness to risk nuclear attack to defend its allies. A more survivable nuclear force could lead North Korea to conclude that it has immunity from any international response and therefore act even more belligerently and use nuclear threats to coerce Seoul into accepting regime demands. The regime could use threats of nuclear attack to force Tokyo to deny U.S. forces access to Japanese bases, ports, and airfields during a Korean conflict. Pyongyang might also assume that conditions for military action had become favorable if it believed that the U.S. extended deterrence guarantee had been undermined.

The increasing rate and diversity of North Korea’s missile launches shows that Pyongyang is making significant progress toward implementing a more capable and flexible nuclear strategy, including preemptive strikes with strategic, tactical, and battlefield nuclear weapons. During a crisis, the threshold for the use of nuclear weapons could therefore be breached more easily.

This *Index* assesses the overall threat from North Korea, considering the range of contingencies, as “testing” for level of provocative behavior and “gathering” for level of capability.



**A broad array of terrorist groups** remain the most explicitly hostile in their rhetoric and intent (even though much less capable of causing serious harm to the U.S., directly, than major powers like China or Russia) of any of the threats to America examined in the *Index*. The primary terrorist groups of concern to the U.S. homeland and to Americans abroad are the Islamic State of Iraq and al-Sham (ISIS) and al-Qaeda.

ISIS has lost its so-called caliphate, but it remains a highly dangerous adversary that is capable of planning and executing attacks regionally and—at the very least—inspiring them in the West. It has transitioned from a quasi-state to an insurgency, relying on its affiliates to project strength far beyond its former Syrian and Iraqi strongholds. Meanwhile, despite sustained losses in leadership, al-Qaeda remains resilient. It has curried favor with other Sunnis in areas of strategic importance to it, has focused its resources on local conflicts, has occasionally controlled territory, and has deemphasized (but not eschewed) focus on the global jihad. This approach has been particularly noticeable since the Arab Spring.

Regardless of any short-term tactical considerations, both groups ultimately aspire to attack the U.S. homeland and U.S. interests abroad. The terrorist threat to the U.S. homeland from Afghanistan and Pakistan remains real and uncertain in a rapidly shifting landscape that is home to a wide variety of extremist and terrorist groups. On one hand, the capabilities of al-Qaeda, the terrorist group that is most directly focused on attacking the U.S. homeland, have been degraded in South Asia. On the other hand, the U.S. withdrawal from Afghanistan and the Taliban/Haqqani Network takeover of the country have generated significant uncertainty about Afghanistan's future and the panoply of terrorist and extremist groups operating in that space, including the local branch of the Islamic State.

In its interim peace agreement with the U.S., the Taliban ostensibly committed to preventing Afghan soil from being used to launch attacks against the U.S. homeland, but experts remain skeptical of these commitments. For its part, Pakistan continues to harbor and support a vibrant ecosystem of terrorist groups within its borders.

This *Index* assesses the threat from ISIS, al-Qaeda, and their affiliated organizations as “aggressive” for level of provocative behavior and “capable” for level of capability.

Just as there are American interests that are not covered by this *Index*, there may be additional threats to American interests that are not identified here. This *Index* focuses on the more apparent sources of risk and those that appear to pose the greatest threat.

Compiling the assessments of these threat sources, the *2024 Index* rates the overall global threat environment as “aggressive” for threat actor behavior and “formidable” for material ability to harm U.S. security interests. We have raised our rating of the aggregated material ability (capability) of adversaries to harm U.S. interests from the *2023 Index*'s “gathering” for several reasons:

- Mounting concern over China's dramatic expansion of its power projection abilities (especially its investment in nuclear weapons);
- Russia's potentially desperate desire for victory in its war against Ukraine, especially if this drives Moscow to be more aggressive in other areas of military competition with the U.S. and Western allies;
- Iran's unabated investments in its nuclear program, ballistic missile capabilities, and terrorist groups in the Middle East; and
- Further decline in America's military condition. We do not attempt a net comparison of U.S. military capabilities with those of competitors, either singly or in combination, but we also cannot view changes in the threat environment without taking into consideration America's ability to deal with rising threats. Were the U.S. military stronger, improvements in a competitor's military might not be so worrisome, but it appears that changes in adversary portfolios are not being offset by commensurate changes in the U.S. military or the militaries of key allies.

This leads us to sustain our score for the aggregated global threat environment as “high” in the *2024 Index*.

### **The Status of U.S. Military Power**

Finally, we assessed the military power of the United States in three areas: capability, capacity,

## U.S. Military Power: Army

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

## U.S. Military Power: Navy

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

## U.S. Military Power: Air Force

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

## U.S. Military Power: Marine Corps

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

## U.S. Military Power: Space

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

## U.S. Military Power: Nuclear

|                                | VERY WEAK | WEAK | MARGINAL | STRONG | VERY STRONG |
|--------------------------------|-----------|------|----------|--------|-------------|
| Nuclear Stockpile              |           |      |          | ✓      |             |
| Delivery Platform Reliability  |           |      | ✓        |        |             |
| Warhead Modernization          |           |      | ✓        |        |             |
| Delivery Systems Modernization |           |      |          | ✓      |             |
| Nuclear Weapons Complex        |           |      | ✓        |        |             |
| National Labs Talent           |           |      | ✓        |        |             |
| Allied Assurance               |           |      |          | ✓      |             |
| <b>OVERALL</b>                 |           |      | ✓        |        |             |

## U.S. Military Power

|                | VERY WEAK | WEAK | MARGINAL | STRONG | VERY STRONG |
|----------------|-----------|------|----------|--------|-------------|
| Army           |           |      | ✓        |        |             |
| Navy           |           | ✓    |          |        |             |
| Air Force      | ✓         |      |          |        |             |
| Marine Corps   |           |      |          | ✓      |             |
| Space          |           |      | ✓        |        |             |
| Nuclear        |           |      | ✓        |        |             |
| <b>OVERALL</b> |           | ✓    |          |        |             |

and readiness. We approached this assessment service by service as the clearest way to link military force size; modernization programs; unit readiness; and (in general terms) the functional combat power (land, sea, air, and space) that each service represents.

We treated America's nuclear capability as a separate entity because of its unique characteristics and constituent elements, from the weapons themselves to the supporting infrastructure that is fundamentally different from the infrastructure that supports conventional capabilities. We address the status of missile defense and the context within which it operates in a similar manner. We do not offer metrics by which to measure the effectiveness or sufficiency of current missile defense capabilities, but in describing the challenges involved in defending against an enemy missile barrage capable of damaging the U.S., we trust the reader will come to obvious conclusions about the sufficiency and shortfalls of current capabilities. Finally, while not

fully assessing cyber as we do the Army, Navy, Air Force, Marine Corps, and Space Force, we acknowledge the importance of new tools and organizations that have become essential to deterring hostile behavior and winning wars.

These three areas of assessment (capability, capacity, and readiness) are central to the overarching questions of whether the U.S. has a sufficient quantity of appropriately modern military power and whether military units are able to conduct military operations on demand and effectively.

As reported in all previous editions of the *Index*, the common theme across the services, the U.S. nuclear enterprise, and ballistic missile defense capabilities is one of force degradation or stunting caused by many years of underinvestment, poor execution of modernization programs, and the negative effects of budget sequestration (cuts in funding) on readiness and capacity in spite of repeated efforts by Congress to provide relief from low budget ceilings imposed by the Budget Control Act of 2011

(BCA). The services have undertaken efforts to reorient from irregular warfare to large-scale combat against a peer adversary, but such shifts take time and even more resources.

Because of the rising costs of fuel, munitions, and repair parts, the lack of qualified maintainers and maintenance facilities, and the aggregate effects of the sustained use of forces and provision of munitions to Ukraine, as well as our limited industrial capacity, much of the progress in regaining readiness that had been made in 2020 and 2021 has been lost. The forecast for 2024 is likewise gloomy given a proposed FY 2024 defense budget that will not be sufficient to keep pace with ongoing and dramatic increases in inflation and an agreement to limit federal spending (to include defense accounts) that was arranged in FY 2023 to forestall defaulting on the national debt until January 2025.

Experience in warfare is ephemeral and context-sensitive. Valuable combat experience is lost as servicemembers who individually gained experience leave the force, and it retains direct relevance only for future operations of a similar type: Counterinsurgency and adviser support operations in Iraq, for example, are fundamentally different from major conventional operations against a state like Iran or China.

Although portions of the current Joint Force are experienced in some types of operations, the force as a whole lacks experience with high-end, major combat operations of the sort being seen in Ukraine and toward which the U.S. military services have only recently begun to redirect their training and planning. Additionally, the force is still aged and shrinking in its capacity for operations even if limited quantities of new equipment like the F-35 Lightning II fighter are being introduced.

We characterized the services and the nuclear enterprise on a five-category scale ranging from “very weak” to “very strong,” benchmarked against criteria elaborated in the full report. These characterizations should not be construed as reflecting either the competence of individual servicemembers or the professionalism of the services or Joint Force as a whole; nor do they speak to the U.S. military’s strength relative to the strength of other militaries around the world in direct comparison. Rather, they are assessments of the institutional, programmatic, and material health or viability of America’s hard military power, benchmarked against historical

instances of use in large-scale, conventional operations and current assessments of force levels that would likely be needed to defend U.S. interests against major enemies in contemporary or near-future combat operations.

Our analysis concluded with these assessments:

- **Army as “Marginal.”** Based on the historical use of its ground forces in combat, the Army has less than two-thirds the forces it would need in its Active Component to handle more than one major regional conflict. This shortfall in capacity might be offset if the modernity or technological capability of its forces were very high, but this is not the case. Much of the Army’s primary equipment is old, and despite modest progress in modernization, nearly all new Army equipment programs remain in the development phase and in most cases are at least a year from being fielded. FY 2024 requested funding levels for procurement and research and development (R&D) are down 8 percent from the preceding year, which further slows the pace of Army equipping and reduces the speed of procurement to below industry’s minimum sustainment rates in some cases. With regard to readiness, the Army’s internal requirement is for “66 percent...of the active component BCTs [to be] at the highest readiness levels,” and it has exceeded this level in FY 2024.

In short, although the Army has made progress in its readiness for action, it is still aging faster than it is modernizing and continues to shrink in size as it struggles to recruit young Americans to join the service—a situation that is proving extraordinarily hard to remedy. Consequently, the Army is scored as “marginal” overall.

- **Navy as “Weak.”** The Navy needs a battle force consisting of 400 manned ships to do what is expected of it today. Its current battle force fleet of 297 ships reflects a service that is much too small relative to its tasks. Given current and projected shortfalls in funding for shipbuilding, the Navy is unable to arrest and reverse the decline of its fleet as adversary forces grow in both number and capability.

Compounding the shortfall in capacity, the Navy's technological edge is narrowing relative to peer competitors China and Russia. Ships are aging faster than they are being replaced, with older ships placing a greater burden on the maintenance capabilities of our relatively few shipyards. In addition, the Navy's inadequate maintenance infrastructure prevents ships in repair from returning to the fleet in a timely manner, and the loss of steaming days needed to train crews to levels of proficiency diminishes readiness. In combination, this leads to an overall score of "weak" for the U.S. Navy.

- **Air Force as "Very Weak."** The Air Force has deployed an average of 28 fighter squadrons to major theaters of war since the end of World War II. This equates to 500 Active Component fighter aircraft to execute one major regional conflict (MRC). Adding a planning factor of 20 percent for spares and attrition reserves brings the number to 600 aircraft. An Air Force able to manage more than a single major conflict would necessarily require 1,200 active-duty, combat-coded fighter aircraft. Currently, the service has 897—three-quarters of the requirement as assessed by this *Index*. The service's inventory of bombers is worse, standing at 64 percent.

Accounting for better inventories in aerial refuelers and strategic lift aircraft, the USAF currently is at 83 percent of the capacity required to meet a two-MRC benchmark. However, the geographic disposition of these aircraft limits the ability of the service to deploy them rapidly to a crisis region, and its ability to replace combat losses is highly questionable because of low mission capability rates (a function of maintenance and trained crews). The result is an Air Force that probably is able to handle only a single major conflict, and that only by resorting to global sourcing, leaving it unable to do much else.

New F-35 and KC-46 aircraft continue to roll off their respective production lines but in small numbers that are more than offset by aircraft retirements. Incredibly low sortie rates and flying hours across every pilot

community will prevent any Air Force combat-coded fighter squadron from being able to execute all or even most of its wartime mission. At best, half of the cadre of pilots within the most capable units will be able to execute just "some" of the unit's wartime missions. There is not a fighter squadron in the Air Force that holds the readiness levels, competence, and confidence levels required to square off against a peer competitor, and readiness continues to spiral downward.

As with a three-legged stool, success or failure is determined by the weakest leg. The shortage of pilots and flying time for those pilots degrades the ability of the Air Force to generate the quality of combat air power that would be needed to meet wartime requirements even if aircraft production was higher and newer aircraft comprised a larger percentage of the Air Force. The overall score for the U.S. Air Force is therefore "very weak."

- **Marine Corps as "Strong."** The score for the Marine Corps was raised to "strong" from "marginal" in the *2022 Index* and remains "strong" in the *2024 Index* for two reasons: because the Corps' capacity is measured against a one-war requirement rather than two (to which the other services are held) and because of the Corps' extraordinary, sustained efforts to modernize (which improves capability) and enhance its readiness during the assessed year. Of the five services, the Marine Corps is the only one that has a compelling story for change, has a credible and practical plan for change, and is effectively implementing its plan to change. However, in the absence of additional funding in FY 2024, if the Corps retains its intention to reduce the number of its battalions from 22 to 21, this reduction will limit the extent to which it can conduct distributed operations as it envisions and replace combat losses (thus limiting its ability to sustain operations). The Corps is already at 73 percent of the battalions (and related air and logistical capabilities) it should have. It needs to grow.

Though the service remains hampered by old equipment in some areas, it has nearly

completed modernization of its entire aviation component, is making good progress in fielding a new amphibious combat vehicle, is fast-tracking the acquisition of new anti-ship and anti-air weapons, and is aggressively leveraging developments in unmanned systems and advanced computing and communication technologies. Full realization of its redesign plan will require the acquisition of a new class of amphibious ships, for which the Corps needs support from the Navy.

The Corps is still too small and has no stated desire to grow, but it possesses fairly modern equipment, especially its air arm, and is wholly committed to adapting as rapidly as possible to meet the challenges of an evolving threat environment, thus prompting this *Index* to score it as “strong” overall.

- **Space Force as “Marginal.”** The number and type of Backbone and ISR assets are sufficient to support global PNT requirements and the majority of strategic-level communications, imagery, and collection requirements of the National Command Authorities and the Department of Defense. While that capacity is growing, the Space Force is not capable of meeting current—much less future—on-demand, operational, and tactical-level warfighter requirements. The service doubled its counterspace weapons systems with capabilities with the Ascent and Tetra-1 satellites, adding the first two known offensive systems to the Space Force Portfolio. Other counterspace systems are probably being developed or, like cyber, already in play without public announcement. Nevertheless, the USSF’s current visible capacity is not sufficient to support, fight, or weather a war with a peer competitor.

The services’ asset modernization plan has significantly accelerated the delivery of systems to the force over the past year, significantly elevating USSF capabilities. However, a majority of Backbone and intelligence, surveillance, and reconnaissance (ISR) assets have exceeded their designed life spans, and a willingness to delay and/or defer the acquisition of replacement systems remains a Department of the Air

Force legacy. The capability of these satellites is marginal, but the service has narrowed gaps in space situational awareness and in defensive and offensive capabilities.

The mission sets, space assets, and personnel that transitioned to the Space Force and those that have been assigned to support the USSF from the other services have not missed an operational beat since the Space Force stood up in 2019. However, there is little evidence that the USSF has improved its readiness to provide nearly real-time support to operational and tactical levels of force operations or that it is ready to execute defensive and offensive counterspace operations to the degree envisioned by Congress when it authorized creation of the Space Force.

Overall, the Space Force rates a grade of “marginal,” which is an improvement over its grade in the *2023 Index*.

- **Nuclear Capabilities as “Marginal.”** The scoring for U.S. nuclear weapons must be considered in the context of a threat environment that is significantly more dangerous than it was in previous years. Until recently, U.S. nuclear forces needed to address one nuclear peer rather than two. Given a U.S. failure to adapt rapidly enough to these developments and the Biden Administration’s decision to cancel or delay various programs that affect the nuclear portfolio, this year’s *Index* changes the grade for overall U.S. nuclear weapons capability to “marginal.”

U.S. nuclear forces face many risks that without the continued bipartisan commitment to a strong deterrent could warrant an eventual decline to an overall score of “weak” or “very weak.” The reliability of current U.S. delivery systems and warheads is at risk as they continue to age and threats continue to advance. The fragility of “just in time” replacement programs only exacerbates this risk. In fact, nearly all components of the nuclear enterprise are at a tipping point with respect to replacement or modernization and have no margin left for delays in schedule—delays that appear to be occurring despite the best efforts of the

enterprise. Since every other military operation—and therefore overall national defense—relies on a strong nuclear deterrent, the United States cannot afford to fall short in fulfilling this imperative mission.

Future assessments will need to consider plans to adjust America’s nuclear forces to account for the doubling of peer nuclear threats. It is clear that the change in threat warrants a

reexamination of U.S. force posture and the adequacy of our current modernization plans.

Therefore, the score for this portfolio has changed from “strong” to “marginal.” Failure to keep modernization programs on track while planning for a three-party nuclear peer dynamic could lead to a further decline in the strength of U.S. nuclear deterrence in future years.

**In the aggregate, the United States’ military posture must be rated as “weak.”** The Air Force is rated “very weak,” the Navy and Space Force are “weak,” and the U.S. Army and nuclear portfolio are “marginal.” The Marine Corps is “strong,” but the Corps is a one-war force, and its overall strength is therefore not sufficient to compensate for the shortfalls of its larger fellow services. With respect to nuclear capabilities, if the United States should need to deploy nuclear weapons, the escalation into nuclear conflict would seem to imply that handling such a crisis would challenge even a fully ready Joint Force at its current size and equipped with modern weapons. Additionally, the war in Ukraine, which threatens to destabilize not just Europe but the economic and political stability of other regions, shows that some actors (in this case Russia) will not necessarily be deterred from conventional action even though the U.S. maintains a strong nuclear capability,<sup>8</sup> which is how this critical military capability was assessed in the *2023 Index*; the decline of America’s nuclear portfolio to “marginal” makes this even more worrisome. Thus, strong conventional forces of necessary size are essential to America’s ability to respond to emergent crises in areas of special interest.

**The 2024 Index concludes that the current U.S. military force is at significant risk of not being able to meet the demands of a single major regional conflict while also attending to various presence and engagement activities.** The force would probably not be able to do more and is certainly ill-equipped to handle two nearly simultaneous MRCs—a situation that is made more difficult by the generally weak condition of key military allies.

In general, the military services continue to prioritize readiness and have seen some improvement over the past few years, but modernization programs, especially in shipbuilding and the production of fifth-generation combat aircraft, continue to suffer as resources are committed to preparing for the future, recovering from 20 years of operations, and offsetting the effects of inflation. In the case of the Air Force, some of its limited acquisition funds are being spent on aircraft of questionable utility in high-threat scenarios while R&D receives a larger share of funding than efforts meant to replace quite aged aircraft are receiving. As observed in the 2021 through 2023 editions of the *Index*, the services have normalized reductions in the size and number of military units, the forces remain well below the level needed to meet the two-MRC benchmark, and substantial difficulties in recruiting young Americans to join the military services are frustrating even modest proposals just to maintain service end strength.

Congress and the Administration took positive steps to stabilize funding in the latter years of the Budget Control Act of 2011 (BCA). This mitigated the worst effects of BCA-restricted funding, but sustained investment in rebuilding the force to ensure that America’s armed services are properly sized, equipped,

trained, and ready to meet the missions they are called upon to fulfill will be critical. This is amplified by the extent to which the United States has drawn from its inventories of munitions and equipment to support Ukraine's defense and the extent to which the defense industry has been limited in its ability to replenish depleted stocks, much less support the expansion and deepening of U.S. capabilities in preparation for any other conflict. At present, the Administration's proposed FY 2024 defense budget falls far short of what the services need to regain readiness and replace aged equipment, and Congress's intention to increase the proposed budget by approximately 3.5 percent over the FY 2023 budget<sup>9</sup> accounts for barely half of the current rate of inflation, which averaged 8 percent in calendar year 2022 and 4.6 percent from January–July 2023.<sup>10</sup>

**As currently postured, the U.S. military is at significant risk of not being able to defend America's vital national interests with assurance. It is rated as "weak" relative to the force needed to defend national interests on a global stage against actual challenges in the world as *it is* rather than as we wish it were. This is the inevitable result of years of sustained use, underfunding, poorly defined priorities, wildly shifting security policies, exceedingly poor discipline in program execution, and a profound lack of seriousness across the national security establishment even as threats to U.S. interests have surged. In 2023, this has been compounded by the cost of U.S. support for Ukraine's defense against Russia's assault, which is further exacerbated by the limited willingness of allies in Europe to shoulder a greater share of the support burden. This was made worse by Hamas's barbaric attack on Israel, which prompted the U.S. to provide equipment, munitions, and missile defense resources to Israel to aid in its defense, further pressuring America's defense posture. These wars have laid bare the limited inventories of equipment, munitions, and supplies of all supporting countries as well as the limitations of the industrial base that will be required to replenish them, especially in the U.S., which must always look to its core national security interests.**

Once again, future security threats cannot be predicted in their time, place, and severity, but they are nevertheless knowable with certainty because history has demonstrated repeatedly that threats arise with regularity in spite of efforts to deter and thwart them; that they often appear in complex arrangements of enemies, timing, and location; and that the time available to build capacity and readiness to deal with them is always in short supply. It is therefore incumbent on national leaders and the American people to approach investing in the nation's security with the utmost seriousness and consistency. Otherwise, everything the United States is and represents is at substantial risk.



## Endnotes

1. See U.S. Department of Defense, *2022 National Defense Strategy of the United States of America Including the 2022 Nuclear Posture Review and the 2022 Missile Defense Review*, pp. 4–6, <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF> (accessed September 6, 2023). Though the Biden Administration's defense budget requests have neither enabled the growth of U.S. military capabilities nor even arrested their decline, the text of the National Defense Strategy implies the need for a large military force capable of action in at least two distinct theaters against two very different opponents possessing substantial conventional and nuclear capabilities. For example, "The PRC seeks to undermine U.S. alliances and security partnerships in the Indo-Pacific region, and leverage its growing capabilities, including its economic influence and the People's Liberation Army's (PLA) growing strength and military footprint, to coerce its neighbors and threaten their interests...." In addition to expanding its conventional forces, the PLA is rapidly advancing and integrating its space, counterspace, cyber, electronic, and informational warfare capabilities to support its holistic approach to joint warfare. The PLA seeks to target the ability of the Joint Force to project power to defend vital U.S. interests and aid our Allies in a crisis or conflict. The PRC is also expanding the PLA's global footprint and working to establish a more robust overseas and basing infrastructure to allow it to project military power at greater distances. In parallel, the PRC is accelerating the modernization and expansion of its nuclear capabilities. The United States and its Allies and partners will increasingly face the challenge of deterring two major powers with modern and diverse nuclear capabilities—the PRC and Russia—creating new stresses on strategic stability." Ibid., p. 4. Additionally, Russia is described as an "acute threat." Ibid., pp. 2 and 5. "Even as the PRC poses the Department's pacing challenge, recent events underscore the acute threat posed by Russia. Contemptuous of its neighbors' independence, Russia's government seeks to use force to impose border changes and to reimpose an imperial sphere of influence. Its extensive track record of territorial aggression includes the escalation of its brutal, unprovoked war against Ukraine. Although its leaders' political and military actions intended to fracture NATO have backfired dramatically, the goal remains. Russia presents serious, continuing risks in key areas. These include nuclear threats to the homeland and U.S. Allies and partners; long-range cruise missile threats; cyber and information operations; counterspace threats; chemical and biological weapons (CBW); undersea warfare; and extensive gray zone campaigns targeted against democracies in particular. Russia has incorporated these capabilities and methods into an overall strategy that, like the PRC's, seeks to exploit advantages in geography and time backed by a mix of threats to the U.S. homeland and to our Allies and partners." Ibid., p. 5. When the threats posed by Iran, North Korea, and violent extremist organizations as outlined in the NDS are added, one can only conclude that the U.S. military must be able to handle more than one major problem at a time—a necessity that successive Administrations have faced for several decades.
2. According to some accounts, the U.S. has been involved in 106 wars or conflicts since its founding, but many analysts would dispute the idea that an intervention that is small in scale, scope, or duration or a set of drone strikes against an enemy is the same as a war that calls for large-scale mobilization and the use of substantial military power over a significant period of time. Even "large-scale" is a relative term: a function of the U.S. population and the resources available at that time. America's war with Mexico in the 1840s pales in comparison to World War II, but for its time, it was a significant commitment of military forces. In the latter sense, the U.S. has been at war or involved in meaningful armed conflict approximately 15 times, not including its iterative clashes with North American Indian tribes from the late 1700s to the early 1920s. Accounting for the 12–13 larger wars, the average time between them is 16 years, skewed by the short periods of five years between World War II and Korea, seven years between Korea and Vietnam (at its earliest stage), and how one accounts for America's invasion of Iraq in 2003 relative to operations in Afghanistan or its earlier war against Iraqi forces in 1991. Conflicts that fit into the category of "war" include the American Revolution, 1775–1783; Quasi-War with France, 1798–1800; War of 1812 (against Great Britain), 1812–1815; Mexican–American War, 1846–1848; U.S. Civil War, 1861–1865; War with Spain, 1898; Philippine–American War, 1899–1902; Mexican Border War, 1910–1919; World War I, 1917–1918; World War II, 1941–1945; Korean War, 1950–1953; Vietnam Conflict, 1960–1973; Gulf War (Operations Desert Shield and Desert Storm), 1990–1991; Operation Enduring Freedom (most directly associated with operations in Afghanistan), 2001–2021; and Operation Iraqi Freedom, 2003–2011.
3. Various national security pundits have offered alternative approaches to dealing with a world that is increasingly at odds with U.S. interests, but whether the prescription is deterrence by denial, deterrence by punishment, integrated deterrence, or some other use of power to deter a competitor from acting against U.S. interests, the U.S. must possess the ability to deal with an imminent threat of substantial capabilities while also preserving the ability to handle a different threat of potentially similar magnitude. This requires capacity, capability, relevant proximity to potential use, and the ability to sustain military action over time in more than one area.
4. Robert Greenway, "Strength in Unity: A Sustainable US-Led Regional Security Construct in the Middle East," Hudson Institute, August 2023, p. 9, <https://s3.amazonaws.com/media.hudson.org/Robert+Greenway+-+Strength+in+Unity+-+A+Sustainable+US-Led+Regional+Security+Construct+in+the+Middle+East.pdf> (accessed October 26, 2023).
5. Reuters, "Iran Says U.S. Bases and Aircraft Carriers Within Range of Its Missiles: Tasnim," September 15, 2019, <https://www.reuters.com/article/us-iran-usa-missiles-idUSKBN1W004A> (accessed October 26, 2023).
6. Peter Robertson and Wilson Beaver, "China's Defense Budget Is Much Bigger Than It Looks," Heritage Foundation *Commentary*, September 26, 2023, <https://www.heritage.org/asia/commentary/chinas-defense-budget-much-bigger-it-looks>.
7. Greenway, "Strength in Unity: A Sustainable US-Led Regional Security Construct in the Middle East," p. 10.
8. In the formal sense, Ukraine is not covered by the United States' "nuclear umbrella" per treaty or other legal obligation. Nevertheless, Russia is very aware of U.S. nuclear capabilities and of its interests in Europe's stability and security, most clearly seen in U.S. obligations as a member of NATO but also in the trade, diplomatic, security, and cultural relations it has with European countries in general. That Russia chose to invade Ukraine in spite of the objections the U.S. was sure to raise and the deep concerns the U.S. and its European partners would surely have as a result of Russia's naked aggression, can only mean that America's nuclear posture was not, itself, a deterrent. Thus, the presence, capacity, and capability of U.S. conventional forces on the European continent must be considered on their own merit.

9. At \$842 billion, the defense budget for FY 2024 proposed by the White House is 3.2 percent higher than the \$816 billion proposed for FY 2023. The \$832 billion proposed by the Senate represents an increase of 2 percent (or 3.5 percent depending on one's reference point for what constitutes defense spending). The proposal voted out of the House Appropriations Committee generally aligns with the Senate's, but as this book was being prepared, it had not been subject to a vote of the full House. All of these numbers fall well below the current rate of inflation. See Chart, "DoD Topline Growth FY22–FY23–FY24 Budgets," in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller/Chief Financial Officer), *United States Department of Defense Fiscal Year 2024 Budget Request*, PowerPoint Presentation, March 2023, p. 3, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024\\_Budget\\_Request.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024_Budget_Request.pdf) (accessed August 22, 2023); news release, "Bill Summary: Defense Fiscal Year 2024 Appropriations Bill," Committee on Appropriations, U.S. Senate, July 27, 2023, <https://www.appropriations.senate.gov/news/majority/bill-summary-defense-fiscal-year-2024-appropriations-bill> (accessed August 22, 2023); and press release, "Committee Approves FY24 Defense Bill," Committee on Appropriations, U.S. House of Representatives, June 22, 2023, <https://appropriations.house.gov/news/press-releases/committee-approves-fy24-defense-bill> (accessed August 22, 2023).
10. CoinNews Media Group LLC, U.S. Inflation Calculator, "Current US Inflation Rates: 2000–2023," <https://www.usinflationcalculator.com/inflation/current-inflation-rates/> (accessed August 22, 2023). Based on "U.S. Labor Department data published on Aug. 10, 2023."

# The *Index of U.S. Military Strength*: Ten Years in Review

Dakota L. Wood

The future cannot be predicted, but it is knowable. Trends are not linear or unchangeable as they stretch into the future, but they do illuminate truths and stubborn consistencies in behavior, interests, and the realities of war and what is needed to prepare for it so as to deter it or win it when forced to engage in it. That is the focus of this essay.

A decade of reporting on anything is enough time to get a feel for trends: whether something is headed in the right direction or you have something about which you should be worried. When it comes to the U.S. military and the ability of the United States to defend its interests in the world that *is* rather than the world we *wish* we had, the trends irrefutably show that the U.S. has something about which to be worried.

The ability of a military force to win in battle is only partly a function of its training, morale, and modernity of equipment. Success in war is also a function of how much capability a force has (its capacity) relative to its enemy and the setting within which the battle occurs. If the battle is close to home, it is much easier for the force to be resupplied, reinforced, or supported with long-range weapons. Usually, a fight close to home or near allies gives the force access to bases, ports, and airfields. Conversely, the farther the fight is from home and from allies and supporting infrastructure, the harder it is for the military to continue fighting or even operating as combat exacts its toll. Supplies of munitions, fuel, food, and repair parts begin to dwindle. It gets harder to replace destroyed equipment and combat platforms. The morale of the force becomes more difficult to buoy as the men and women involved suffer the ravages

of battle while knowing that relief is distant, contested, and limited by time and space.

If allies are net contributors, U.S. shortfalls can be mitigated. This presumes, of course, that allies can sustain their own efforts in the first place. Unfortunately, recent history says they cannot. Every ally that has supported coalition efforts in Afghanistan, Iraq, and elsewhere has needed help getting people, equipment, and supplies to the theater and to sustain the flow of logistical resupply over time. The U.S. is one of a very few countries equipped with long-distance cargo aircraft and the aerial refueling planes needed to establish an air bridge to and within an operational theater.<sup>1</sup>

## Allies and Adversaries

Since almost all major military actions since the end of the Cold War have taken place far from Europe—the 1990s crises in the Balkans and the current war in Ukraine being the exceptions—U.S. and allied forces have not had the benefit of ports, airfields, and support bases that were close at hand; they have had to build their own or gain permission from a nearby country that was willing to allow its infrastructure to be used for such operations. In other words, the U.S. has had to support not only itself, but the allies it has called upon to contribute to such efforts.

The value of allies fighting alongside U.S. forces is more than the raw combat power they provide; the political validation of military actions is often essential, and allies typically bring national and operational intelligence capabilities and regional connections that make the overall force more capable. But in military terms, allies tend to be a logistical

burden on combined military action rather than a relief to U.S. capabilities. Thus, knowing whether U.S. allies are increasing their ability to contribute to combined efforts or are falling further behind is quite important.

Knowing the trends among likely adversaries is similarly important: Are they improving their capabilities through investments in various forms of military power, or is their condition eroding over time? It is nearly impossible to predict whether an expansion in capability or the modernization of weapons translates into battle competence and military advantage. These are revealed only in actual combat. But one can be fairly certain that the more equipment a competitor fields, the longer he will likely be able to sustain operations because a large inventory of materiel enables him to replace combat losses, a large inventory of munitions enables him to apply volume-of-fire against his enemy, and large investments to improve the capacity, capability, and (presumably) readiness of his force imply seriousness about military power.

Russia's war against Ukraine is instructive. Though Russia's extremely poor performance has surprised most analysts and observers, the sheer size of its inventory of vehicles, aircraft, people, and especially munitions has enabled it to sustain its assault on Ukraine since late February 2022 in spite of strategic and operational incompetence. Western support has enabled Ukraine both *not to lose* and to impose substantial losses on Russia, but Russia has leveraged its vast quantities of materiel to remain in the fight, even pulling 1950s vintage tanks from storage.<sup>2</sup> One can scoff at such relics being committed to modern combat, but a T-54 tank on the battlefield is still better than a modern British Challenger II sitting in a vehicle lot in England.

The point here is that investments in military forces that expand capacity can offset shortfalls in quality (to an extent) and competence. Russia's military leaders have badly mismanaged both the invasion and many of the operations that have taken place since then, yet the Russian military still occupies one-fifth of Ukraine, has destroyed much of the country, and has imposed several hundred thousand casualties, both military and civilian, on Ukraine and itself.

Capacity of force covers a multitude of sins in competence and capability. Referring again to the Russia-Ukraine war, Russian forces have often

averaged 60,000 rounds a day of artillery fire<sup>3</sup> to the Ukrainians' 6,000 rounds,<sup>4</sup> a 10-to-one advantage in volume even though Ukraine has often shown itself to be more innovative in action and has been supported by more advanced Western munitions and artillery (rocket and cannon) systems. Quantity can have a quality of its own.<sup>5</sup> It is somewhat unfortunate, then, that the West—including the United States—places so much emphasis on quality that the increased cost results in the fielding of few platforms and weapons. The resulting force may be very modern but still have difficulty sustaining operations when attrition becomes a major factor.

Ten years of *Index* reporting<sup>6</sup> clearly shows two things:

- America's likely nation-state adversaries—China, Russia, Iran, and North Korea—have consistently invested in large quantities of military capability while also attempting to pace or surpass U.S. quality, and
- They are succeeding in some areas.

This is especially true with respect to munitions and for a compelling reason: Advances in relevant technologies (sensors, guidance systems, propulsion, and explosives) have made anti-platform weapons and munitions more effective at dramatically less cost than the platforms they are meant to destroy. This leads to the problem of salvo density (can one defend against a large quantity of incoming munitions?) and cost-imposition strategies (how good does a platform need to be, and at what cost, to survive against a barrage of comparatively inexpensive, precision-guided munitions?) that can place “better” militaries at a significant disadvantage. In fact, it is quite possible for advanced military forces to price themselves out of competition if the country is not willing to sustain a defense budget large enough to support *capacity* of capability.

Again, the Russia-Ukraine war, though not predictive of future war, is illustrative: Weaponized, remotely piloted drones costing several hundred to perhaps a few thousand dollars have been used consistently to destroy multimillion-dollar armored vehicles, including main battle tanks. Does this mean armored vehicles are obsolete? No, but it does suggest that any modern force will have to account for equipment inventories that include

enough armor to absorb such losses while also being equipped with updated defensive capabilities that mitigate such an attack vector.

The expense of war seems always to increase, not decrease, and expense increases even more with distance. This reality has implications for force capacity as well as for the geographical positioning of forces and the ability of countries' industrial bases to equip, repair, and replace assets in a timely manner.

It is certainly the case that America's competitors have been hard at work building capacity (larger forces and the industrial base that makes them possible) while also modernizing their forces over the past decade. The evidence is indisputable.

Ten years ago, the *Index* reported growing concerns within the West, and particularly within the U.S., about modernization efforts in China and Russia. Both countries had witnessed what the U.S. was able to do in Operations Desert Shield and Desert Storm (1990–1991), the first a six-month buildup of U.S.-led coalition forces in Saudi Arabia that enabled the second, a two-pronged offensive into Kuwait to drive out Iraqi forces sent there by Saddam Hussein to claim the country as a province of Iraq.

Initiated with a 42-day air campaign of more than 100,000 attack sorties, followed by a massive ground campaign that lasted a mere 100 hours,<sup>7</sup> the war saw the first widespread use of precision-guided munitions (PGMs) and stealth aircraft. The rapidity, devastating effectiveness, and scale of Operation Desert Storm were a grand testament to the force built in the 1980s to defeat Soviet and Warsaw Pact forces in Europe. It was followed in the mid-1990s by NATO operations in Bosnia and Herzegovina in which PGMs were again used with astonishing accuracy.

After the terrorist attacks of September 11, 2001, the U.S., assisted by a broad coalition of partner countries, launched operations into Afghanistan, nearly seven thousand miles from New York City; Shanksville, Pennsylvania; and Washington, D.C., the sites where a total of 2,977 Americans were killed by al-Qaeda terrorists. That the U.S. was able to launch combat operations so far from home—initially, special operations forces supported by precision air strikes and, later, a large-scale deployment of conventional forces—and sustain operations for several years spoke to the capability of the U.S. military, something that no other military was able to

contemplate much less execute. That America was also able to launch a second major operation from Kuwait into Iraq in 2003 doubly emphasized the importance of quantity.

Taking notice, China and Russia committed to modernizing their military power and professionalizing their forces, shifting from conscript militaries possessing aged, early Cold War equipment to forces loosely modeled on Western designs and reorganized to facilitate the type of joint, combined arms operations the U.S. preferred and with which it had arguably been successful in achieving initial war aims.

### **China: Power Projection and Provocation**

Since 2015, China has significantly reorganized its military and reoriented it from an inward-looking force concerned primarily with internal security, with priority given to the army, to an outward looking, power projection-capable force that emphasizes air, naval, and strategic rocket forces. To solidify its claims over contested maritime features and waters, it undertook construction of artificial islands in the South China Sea and around the Spratlys (begun in 2014).<sup>8</sup>

In 2017, Beijing struck an agreement with Djibouti, a small country on the horn of North Africa, to construct China's first foreign base,<sup>9</sup> a naval base that gives it a perch on the strategically important Bab al-Mandab Strait that connects the Red Sea with the Gulf of Aden and the Arabian Sea and through which flows approximately five million barrels of oil and petroleum products each day.<sup>10</sup>

By 2020, China had enjoyed many years of sustained double-digit growth in its investments in defense capabilities, modernizing nearly all capabilities across all of its services. It also increased its military activities around Taiwan in response to that island's 2020 election results that brought an independence-minded president into office, rammed and sank a Vietnamese fishing boat with one of its coast guard vessels, placed a sophisticated communications relay satellite into orbit, and landed a second probe on the moon.

Since 2022, China has grown its navy to a fleet of more than 360 ships; fielded fifth-generation stealth fighters (the J-20 and J-31, copies of the U.S. F-22 and F-35, respectively)<sup>11</sup>; developed a stealth bomber similar to the B-2; deployed four new Jin-class nuclear powered ballistic missile submarines;

initiated construction of three fields of intercontinental ballistic missiles that will triple China's inventory of nuclear-tipped ICBMs to 300; increased its stockpile of nuclear warheads to 400 or more; and developed a hypervelocity glide vehicle designed to evade U.S. missile defense capabilities.

With respect to Taiwan, China has increased its provocative, testing probes of and incursions into Taiwanese airspace and sea space in each of the past four years, penetrating Taiwan's airspace 380 times in 2020, 960 times in 2021, and 1,727 times in 2022.

In 2022, China's air force numbered 1,700 combat aircraft, 700 of which are considered fourth generation (equivalent to a U.S. F-16, F/A-18, or F-15). In 2022, it expanded its amphibious assault ship capabilities and quantities of long-range strike aircraft, cruise missiles, and bombers, all of which would be essential to any operation to take Taiwan by force or to cow it into submission. As if to prove the point, China operated 14 ships around the island in August 2022, and 12 ships and 91 aircraft rehearsed a blockade in April 2023. Chinese fishing and coast guard vessels constantly encroach within Taiwan's 12 nautical mile limit. China is obviously serious about improving the capability and capacity of its military, driven by clarity of purpose and national objectives.

### **Russia: Expansion and Aggression**

Russia—China's neighbor, sometimes friend, but more often historical competitor—has been equally aggressive and intent on improving its military posture over the past decade. In 2014, Russia infamously seized Ukraine's Crimean peninsula, absorbing the bulk of Ukraine's navy, the major port of Sevastopol, and the Sea of Azov.<sup>12</sup> In 2014 and 2015, Russia increased its support for rebels in Ukraine's Donbas region, restive Serbs in the Balkans, and disruptive activities in the Caucasus.

Russia also increased its investments in the Arctic, conducting large exercises in northern Arctic waters and orienting two-thirds of its navy toward that region. By 2024, Russia had reactivated, built, or improved six bases, 14 airfields, and 16 deepwater ports and fielded 14 arctic-capable icebreakers (10 times the number possessed by the U.S.<sup>13</sup>) along its northern coast.

From 2018 to the present, Russia has made substantial investments in missiles of all types as well as underwater weapons (for example, the Poseidon

nuclear-tipped and nuclear-powered torpedo<sup>14</sup>); air and missile defense systems; anti-satellite capabilities; and a new RS-28 Satan 2 ICBM. During this period, Russian officials were accused of poisoning political enemies, and the government expelled diplomats and ordered the closure of the U.S. consulate in Saint Petersburg; strengthened relations with Egypt, Syria, Venezuela, and Iran; and committed to a creeping occupation of Montenegro.

As of February 2023, some 13,000 Russians had settled in Montenegro (a NATO member since 2017) since the start of the war against Ukraine one year earlier, arriving overland through Serbia. As was the case in Crimea and Donbas, Russia can be expected to push out or forcibly remove locals who are not to its liking and emigrate its own people to establish a population that is favorable to Moscow. Such actions occur below the level of war, do not draw a response from the West, and ultimately establish effective Russian control of an area.

Russia's efforts to improve its military capabilities and the readiness of its forces were also reflected in very large military exercises. Snap (no-notice) exercises became common, augmenting announced mobilizations like the Zapad series in which Russia would deploy forces close to Ukraine for weeks of high-intensity training.

A major exercise in 2021 was especially worrisome because it was accompanied by intense rhetoric aimed at Ukraine. The exercise included combat enablers like expanded medical care and large quantities of blood supplies that have not normally been part of such an exercise; lasted much longer than usual; and included as many as 300,000 personnel (depending on how people are associated with the event) and 35,000 combat vehicles, 900 aircraft, and 190 ships. When it ended, Russia left a large amount of equipment and various support capabilities in place. When it invaded Ukraine in February 2022, Russia was able to leverage the materiel it had left close to the Russia-Ukraine border.<sup>15</sup>

### **Iran and North Korea: Growing Nuclear and Missile Capabilities**

Iran and North Korea were similarly investing in capabilities and provocations to achieve their various objectives.

Iran was doggedly consistent in its behavior over the past decade. It was reliably supportive of terrorist organizations in the Middle East, notably

Hezbollah and Hamas, emphasizing actions against Israel (mostly rocket attacks) and combat activity in Syria in support of Bashar al-Assad's efforts against rebel challengers nominally supported by the West. As if to culminate a decade of *Index* reporting on the threat that Iran and its terrorist proxies present to the region, Hamas viciously attacked Israel on October 7, 2023, specifically targeting civilians, killing approximately 1,400 and injuring many more. Israel responded by declaring war on Hamas and undertook a military campaign of its own to eliminate Hamas as a threat to the country and its people.<sup>16</sup> Encouraged by Iran, the escalation of attacks from Hamas and Hezbollah on Israel, in addition to provoking Israel's military response, threatens to broaden the war to involve more combatants and escalate the war's intensity—a perfect illustration of the very concern this *Index* has with the destabilizing effect that terrorist groups can have on regions of critical importance to the U.S.

Iran was certainly consistent in its harassment, interdiction, and occasional seizures of commercial ships moving cargo and petroleum products from the Persian Gulf through the Strait of Hormuz into the Gulf of Oman and larger Arabian Sea. In 2020, Iran allegedly damaged four tankers near the United Arab Emirates (UAE) and attacked two tankers in the Gulf of Oman. It escalated such activities over the next two years, harassing, attacking, or interfering with at least 18 ships transiting the area.

In 2020, in reprisal for the U.S. killing of General Qasem Soleimani, the leader of the Iranian Quds Force and interlocutor with Hezbollah, Hamas, and other terrorist organizations, Iran launched a missile attack against an Iraqi base that was hosting U.S. forces. It mounted another such an attack (this time by proxy) in 2022, equipping Houthi forces with two missiles with which they attacked the Al-Dhafra air base in Saudi Arabia, home to 2,000 U.S. service personnel.

Militarily, Iran was relentless in expanding its inventory of missiles—for many years the largest in the Middle East—and making qualitative improvements, especially in areas linked to its nuclear program. In 2020, it launched a military satellite into orbit using a vehicle (rocket) with features needed for a long-range military missile rather than a lift body for commercial payloads. A year later, the government revealed a new launch vehicle that could be launched from a mobile pad

and was suitable for military rather than commercial or scientific use.

Iran also continued to obstruct international monitoring of its nuclear program, refusing to reinstall International Atomic Energy Agency (IAEA) monitoring devices it had unilaterally disabled in 2022. In February 2020, Iran was assessed to have 1,500 kilograms of low enriched uranium; in 2023, its stock of uranium had been enriched to 60 percent, the quantity (122 kg) sufficient to produce three nuclear warheads if enriched further to 90 percent.<sup>17</sup>

North Korea was also busy over the decade of *Index* reporting. As early as 2015, it was assessed as being able to miniaturize a nuclear warhead, which would give it the ability to place a usable nuclear weapon atop a long-range missile, thus presenting a profound threat to any country within the missile's range. In that same year, some analysts concluded that the regime's KN-08 missile had the range to reach the United States: In other words, North Korea had the potential to attack the U.S. directly with a nuclear weapon. Since then, the government ruled by Kim Jong-un has made every effort to improve its portfolio of nuclear weapons and the means to deliver them.

In 2017, North Korea had two successful tests of a road-mobile ICBM that could reach America. By 2022, the country was testing the Hwasong-17, the world's largest road-mobile ICBM and likely able to carry three to four nuclear warheads. In January 2023, Kim Jong-un vowed to “exponentially increase” the production of nuclear weapons. In the preceding year, the North Korean military conducted at least 69 ballistic missile tests, eight cruise missile tests, and at least one hypersonic missile test. In addition, from 2014 to 2023, the regime launched numerous missiles with a variety of ranges into the seas around South Korea and Japan and engaged in the most inflammatory diplomatic rhetoric against all powers that it perceived as threatening its viability.

Intermixed, of course, were relentless efforts to attack Western governments and institutions with malware either in the hope of disrupting the normal operations of governments, industry, and private citizens or for more mundane reasons like cyber-theft of intellectual property or to infect computer systems with ransomware so as to extract payment.

Though the actions of these adversaries have differed in their specifics across the years, they generate a common insight: Countries do what they want to do to achieve their objectives regardless of U.S. desires. Each of these threats to U.S. interests has methodically and consistently invested in its military power, expanding capacity, deepening inventories, and improving the modernity of its forces. Each is more capable today than it was 10 years ago.

Russia might be the exception given the losses it has sustained in its 18-month war against Ukraine, but even in this case, there is serious cause for concern. War generates experience and demands adaptation. Those who are not engaged in war adapt from an academic understanding informed by observation, experimentation, simulation, and exercises. Such adaptation lacks urgency and can lead to presumed solutions that fail under the stress of real-world application. In Russia's case, its losses have been absorbed by its land forces, but they have adapted along the way, even if that has meant reverting to old but proven Soviet practices that emphasize volume of fire, obstacles, and entrenchment over maneuver. Untouched are its submarine force, long-range bombers, and nuclear weapons—the tools that are of greatest concern to the U.S. homeland.

### **The Operating Environment: Europe**

As we have seen, the countries posing the most substantial threats to U.S. interests have improved their position over the past decade. What of U.S. allies and the environment within which America's military forces would undertake combat operations? The answer is sobering: Unfortunately, our allies have not been as focused and committed as our adversaries have been.

In 2014, only four of NATO's member countries met the benchmark objective of investing 2 percent of GDP in their national defense and spending 20 percent of that 2 percent on equipment. Germany invested only 1.3 percent, and most of that went to personnel. France and the United Kingdom were reducing their spending on defense: In the U.K., the government proposed to cut defense by 7.5 percent. All member countries were struggling with debt and high unemployment. NATO, as an organization, was struggling to define itself in terms of mission, its purpose for being. The Cold War was long over, and the war on terrorism, initiated by the terrorist

attacks of September 11, 2001, had lost its unifying imperative. In 2014, the U.S. had no armored brigades in Europe.

The following years were shaped by high unemployment, national debt crises, nationalism, unchecked migration across Europe from North Africa and the Middle East, and the occasional terrorist attack in a major European city. NATO was plagued by poor readiness within the forces contributed to it by member countries. Perhaps the worst offender was Germany, long the industrial heart of Europe and locked into competition with France to see which country would be most influential within the European Union (EU).

In 2017, Germany could field only two battalions that were deemed combat ready. In 2018, Germany had no working submarines, there were 21,000 vacant positions within its military, and only 95 of its 224 Leopard II main battle tanks were in service. By 2020, the military condition of Germany and the U.K. had worsened, and Turkey had been bounced from the F-35 program because of its purchase of the S-400 air defense system from Russia: The U.S. could not accept having its premier fighter regularly surveilled by a Russian-made air defense radar system.

In 2018, Great Britain left the EU—the much-reported Brexit divorce within Europe. Though Britain retained its status as a NATO member, it was at odds with its European neighbors, leaving Germany and France to “call the shots” in continental affairs. This made Germany's status as a military power all the more critical.

In 2020, Europe saw a 50 percent increase in Russian activity probing NATO member air and sea spaces, and the COVID lockdown had wreaked havoc on military readiness. Germany's readiness continued to plummet, especially across its aviation community; France was almost wholly distracted by internal security problems; and the U.S. had stated its intention to withdraw almost all of its forces from Germany, sending some to Poland but bringing most back home.

In 2021, Germany had only 13 tanks available for deployment, half of its military pilots were not NATO-certified, and it was revealed that German warships relied on Russian navigation systems. Great Britain enacted additional defense cuts, and NATO had largely withdrawn from operations in Afghanistan, depriving it of even that combat experience



in a war that pitted modern Western forces against poorly equipped Taliban insurgents.

By 2022, NATO acknowledged that Russia posed the most significant challenge to European security—dramatically shown by Russia’s invasion of Ukraine that February, although China was a rising threat given its penetration into Europe’s markets, tech sector, and physical infrastructure like ports. With the war raging in Ukraine, NATO organized itself to coordinate support to the embattled country.

While the U.S. reinvested in its presence on the continent, Germany continued to struggle with its modernization plans, and the U.K. was barely able to field a single army division composed of just one armor brigade and one maneuver brigade. The once magnificent British Royal Navy had shrunk to a mere 20 surface combatants: two aircraft carriers, six destroyers, and 12 frigates. In 2023, the entire British military—army, navy, air force, and marine corps—numbered 150,350 personnel,<sup>18</sup> smaller than the U.S. Marine Corps alone (currently 174,550). Its army of 79,350 soldiers<sup>19</sup> is the smallest Great Britain has fielded since the 1700s.<sup>20</sup>

In contrast, Poland surged ahead with substantial investments in its military forces, defense industrial base, and purchase of foreign-manufactured military equipment. It also extended an open invitation to the United States to station permanently based forces in the country.

As Poland’s investment in its military rose to 4 percent of GDP and Latvia reintroduced military conscription, Germany was having second thoughts about its 2022 pledge to invest an additional €100 billion in its military.

Finland became the 31st member of NATO in 2023, bringing with it a highly capable defense force but adding its 830-mile border with Russia to NATO’s list of responsibilities. Sweden will also join NATO, although Turkey is slow-rolling the accession process.

Meanwhile, Russia was using more artillery ammunition in two days than existed in the entirety of the U.K.’s stocks<sup>21</sup>—certainly an alarming reality for most NATO members who had allowed their defense production capabilities to wither since the end of the Cold War.

### **The Operating Environment: The Middle East**

Over the past decade, the Middle East remained what it almost always has been: characterized by

religious and political rivalries, terrorism, instability, and competition for influence by the world’s major powers (the U.S., Russia, and China) driven by the global importance of the energy that flows from the region. When the first edition of the *Index* was published in early 2015, the Syrian civil war had already resulted in nearly 200,000 deaths and the displacement of 9 million refugees, and the Islamic State in Iraq and Syria (ISIS) was on the rise. Since that time, ISIS has been defeated in practical terms, but not before laying waste a good portion of Western Iraq and Eastern Syria and generating affiliate terrorist groups in Africa and Central Asia.

The Obama Administration engineered an agreement with Iran in which it was to pause its nuclear program in exchange for the release of \$100 billion in frozen assets and relief from some sanctions. (Importantly, the agreement did not require the dismantlement of Iran’s nuclear enrichment capabilities nor any corresponding reduction in its development of ballistic missile capabilities, the means by which it would most likely deliver a nuclear weapon. It was later proven that Iran secretly continued its nuclear program in deeply buried facilities and barred international inspection of known facilities that were meant to ensure compliance.) Upon taking office, the Trump Administration withdrew from this flawed agreement just a few years later. The COVID-19 pandemic played havoc with the economies of countries in the Middle East, just as it did globally, and governments were increasingly feeling the pressure of the explosive growth of their youth cohorts. In 2022, two-thirds of the region’s population was under 30 years old and faced few employment options, educational opportunities, or various government-subsidized services—the makings of domestic problems unless carefully managed in the years ahead.

Nevertheless, from a defense/security point of view, the U.S. enjoyed relatively good relations with the assortment of countries hosting or working with the U.S. military, including Saudi Arabia, Kuwait, the UAE, Qatar, and Oman, thereby ensuring good productive access to this key region and enabling various U.S. operations in Iraq, Syria, and the Persian Gulf area.

### **The Operating Environment: The Asia-Pacific**

The Asia-Pacific region was much the same: restive (but without the level of terrorism and rampant

instability found in the Middle East) while affording the U.S. excellent access to basing and strong working relationships with key allies (in this case, Japan and South Korea) but under the overhang of growing security challenges (in this case, China and North Korea). Unlike the Middle East or even Europe, the vast distances of the Indo-Pacific region and the distances between basing and support options and likely scenes of action emphasize the additional challenges accompanying any military action of meaningful size and duration.

The U.S. has enduring interests in the broad expanse of the Indo-Pacific. In 2018, 40 percent of global trade goods moved through the Asia market. Sitting astride shipping routes is the Philippines, with which the U.S. has had strained relations, although things improved in 2018, enabling 261 planned activities involving U.S. and Philippine forces. To the south, the U.S. and Australia worked to enhance bilateral relations, and Australia supported an increase in the U.S. military presence to 1,500 personnel on a rotational training/exercise basis. By 2023, U.S. Marines were training to the full agreed upon force size of 2,500 personnel.

Sadly, in 2021, the U.S. suffered a self-inflicted wound in the precipitous and chaotic withdrawal from Afghanistan where U.S. forces had been operating for 20 years, first to exact revenge for the September 11, 2001, terrorist attacks, deposing the Taliban regime that had been harboring al-Qaeda and its leader Osama bin Laden, and later to support the stand-up of the Afghan military with the responsibility both to protect Afghanistan's interests and to support America's by denying use of Afghanistan as a sanctuary by terrorist groups like al-Qaeda.

Whether the U.S. should have fully withdrawn its forces, which had been reduced to just 2,500 by January 2021, is a decision that will be debated for many years. The U.S. contingent had suffered no casualties in the preceding 18 months, and the U.S. presence did enable it to shape Afghan policies and gather intelligence on Iran, Pakistan, and a variety of terrorist groups operating in the region. What is indisputable is that the withdrawal was ordered and executed in a way that resulted in the emergency evacuation of 120,000 people, the deaths of 13 U.S. servicemembers from a suicide bomber, the rout of Afghan security forces by the Taliban, the fall of Afghanistan's government, and the seizure

of power by Taliban leaders. All of this combined to damage U.S. credibility and the perception of U.S. competence.

Whether the Afghan debacle incentivized Russia to invade Ukraine or China to become more aggressive toward Taiwan is hard to know, but perceptions of weakness can prompt people who are inclined to action to take advantage of perceived opportunities. This is at the heart of deterrence: the belief that a competitor can thwart one's ambitions. This extends to perceptions of military power. The U.S. may say it has the world's most capable military, but friends and foes also review U.S. acquisition programs, budgets, flight hour programs, ship availability, personnel shortfalls, and munitions inventories. To the extent that America's allies are militarily weak, it falls to the U.S. military to ensure that the country's interests are defended.

All of which brings us to the status of the U.S. military and how it has changed over the past decade.

### **U.S. Military Strength: Evolution or Devolution?**

The inaugural *2015 Index* addressed the status of the U.S. military in FY 2014 with this summary:

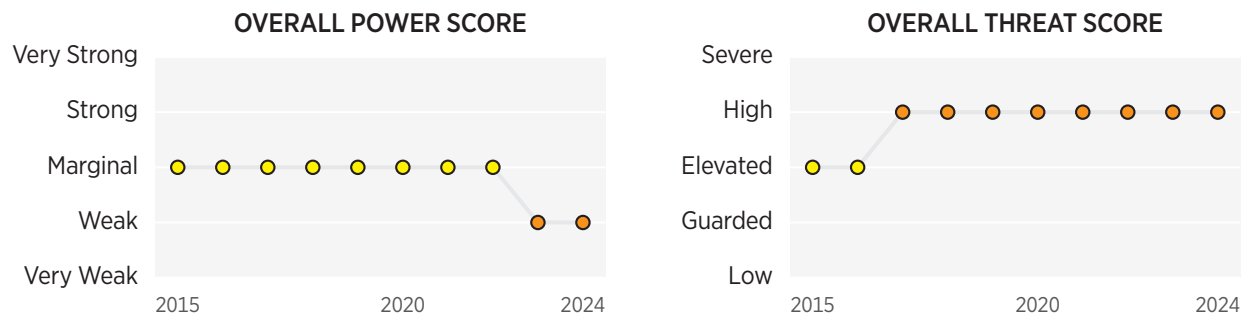
Overall, the *Index* concludes that the current U.S. military force is adequate to meeting the demands of a single major regional conflict while also attending to various presence and engagement activities...but it would be very hard-pressed to do more and certainly would be ill-equipped to handle two, near-simultaneous major regional contingencies.

The cumulative effect of such factors [as problems with funding, maintenance, and aged equipment] has resulted in a U.S. military that is marginally able to meet the demands of defending America's vital national interests.<sup>22</sup>

In general, the services were hobbled with forces that were too small relative to the task of defending U.S. interests in more than one place at a time, and most of the force's equipment was old: Aircraft averaged nearly 30 years old, more than half of the Navy's ships were more than 20 years old, and the primary equipment used by the Army and Marine Corps had been purchased in the 1980s or earlier. Service efforts to correct such deficiencies were

CHART 1

## U.S. Military Strength Dwindles While Threats Continue to Rise



**SOURCE:** Dakota L. Wood, ed., *2024 Index of U.S. Military Strength* (Washington: The Heritage Foundation, 2024), <https://www.heritage.org/military>.

heritage.org

constrained by the Budget Control Act of 2011 (BCA), which arbitrarily capped annual spending on defense and reduced military spending by approximately \$1 trillion over a 10-year period.<sup>23</sup>

The leaders of the services have been consistent over the past 10 years in explaining why new programs were needed and the challenges they faced in recruiting, modernizing, and managing the workload of forces required to deploy repeatedly. But when asked what the impact might be if a requested level of funding wasn't provided or a procurement program was canceled, they usually answered with something like "Well, Senator, we would have to operate at increased risk" without ever clearly explaining what "risk" meant or what national security interest might be harmed in a specific way.

Within the *Index*, risk is placed in the context of enduring national security interests and the historical use of military forces to defend those interests in a major conflict. Within this framework, it is easier to see how shortfalls in capacity or forces assessed as not ready for combat can increase the risk to the nation. As already noted, if America's friends were strong or its enemies were weak, America's need for a robust military might not be as great, but the 10-year record of reporting shows that both factors are troubling: America's adversaries continue to gain strength even as its key allies remain troublingly weak militarily. Hence the importance of understanding the status of America's own military services.

**U.S. Army.** In 2011, the Army enjoyed an end strength of 566,000 soldiers; in 2013, it fielded 45 Brigade Combat Teams (BCTs). By 2014, its end strength had dropped to 510,000, and the number of BCTs had fallen to 38—a loss of 56,000 soldiers (10 percent of the force and equivalent to two divisions of combat power). Of those 38 BCTs, only two were reported as ready for combat. A year later, end strength had fallen by an additional 20,000 soldiers and a BCT, leaving the Army with only 31, which is where it stands today. In 2017, the Army reported only three BCTs as "ready to fight tonight."

Over the following years, the service clawed back some readiness. In FY 2023, it reported that 83 percent of the Army was "ready," although it also reported that BCTs were funded to only 73 percent of training and flying hours for Combat Aviation Brigades were down 13 percent. It seems odd that readiness rates were at their highest in the decade when resources for training and readiness were down, but that's what the Army has reported.

To address its problem with aging equipment—the M1A2 Abrams main battle tank and M2/M3 Bradley Fighting Vehicle, among others—it has several programs in development, but these will not mature for several years. Meanwhile, its artillery (cannon and rocket) is outranged by every major competitor and most allies. Army procurement accounts were cut by 7 percent in FY 2022, R&D accounts were cut by six percent, and military construction funds fell to a historically low level.

Compounding the allocated funding problem was inflation, which resulted in a loss of \$74 billion in purchasing power from FY 2019 to the Army's current budget request for FY 2024.

Perhaps the hardest problem facing the Army is recruiting. American youth have shown little interest in joining the military. In FY 2022, the Army fell 25 percent short of its recruiting objective, failing to recruit 15,000 new soldiers. For FY 2023, the Army requested to have its end strength reduced by 33,000 soldiers, anticipating that it will fall short in new accessions this year as well, leaving it with a force of just 452,000 soldiers—far short of the 540,000 to 550,000 the Chief of Staff of the Army felt was needed in FY 2018. The Army's plan has been to thicken, or slightly overstaff, its BCTs rather than grow more of them, but these manpower problems will instead result in understaffing.

**U.S. Navy.** If the Army is struggling to staff its formations and replace its equipment, the Navy is caught in a maelstrom, unable to maintain a consistent, compelling argument for the size and shape of the fleet it should sail and chronically underfunded even for the 30-year shipbuilding program it is currently trying to execute. The poor condition of its shipyards adds to its ship availability woes, including a serious maintenance backlog.

At 297 ships, the Navy is roughly half the size it was near the end of the Cold War, and it has not shown any appreciable ability to change that condition. In FY 2014, the Navy had 282 ships. The number dropped to 271 in FY 2015 and climbed to 300 in FY 2020 before losing steam and falling to its current 297. This is in spite of a sustained argument since FY 2018 for a fleet of 355 manned ships, although the Navy's plan at that time would not have realized that goal until 2050. The service adjusted its approach to achieve its objective by 2034, but only by planning to extend the life of all of its *Arleigh Burke*-class destroyers to 45 years or more, a potentially unrealistic goal given that the expected service life of such warships historically has not exceeded 30 years.

During the Cold War, the nearly 600-ship fleet allowed the Navy to maintain approximately 100 ships at sea on a regular basis. The Navy maintains that same level of deployed presence but with a fleet half the size, doubling the workload for sailors and ships, which translates into increased maintenance and repair costs (and resultant delays in returning

ships to sea and backlogged maintenance actions for ships needing repair) and a heightened risk of burnout for the force. It is a vicious circle that cannot be broken without dramatic increases in funding that enable more ships to be built and/or a reduced demand for ships to be deployed, which would mean a reduced U.S. naval presence in key regions around the world.

In January 2017, no aircraft carriers were deployed. The U.S. Navy has no dedicated mine countermeasures ships or any frigate-like ships (a role that was supposed to be filled by Littoral Combat Ships that have underperformed relative to expectations and are now being retired far in advance of their planned service life). In 2023, the Commandant of the Marine Corps expressed to Congress his regret that Marine Corps forces were unable to assist with disaster relief operations in Turkey or the evacuation of U.S. citizens from Sudan because there were no amphibious ships available.<sup>24</sup> He also made clear both that “there is no plan to get to the minimum requirements [for 31 amphibious ships]” under the Navy's 30-year shipbuilding plan and that the prospects for commensurate funding within the defense budget were not good.<sup>25</sup>

In FY 2023, it was not uncommon for ships to be undermanned by 15 percent. U.S. Navy end strength fell by 1,300 sailors; shipyards remained in a poor state of repair; every project to correct such deficiencies was delayed or over budget; and the Navy, given the paucity of resources and the strategic importance of ballistic missile and fast attack submarines, prioritized submarine construction over that of surface ships. Two major ship collisions in 2017<sup>26</sup> and the loss of a major amphibious assault ship<sup>27</sup> due to an incompetently handled fire while pierside in 2020 called into question the U.S. Navy's ability to get the basics right, to say nothing of its ability to project naval power in support of securing national interests or even to present a compelling case for how it intended to correct this array of problems.

U.S. naval power appears to be in chaos relative to national interests and the otherwise positive impact of naval engagement and deterrent value of a strong naval force, and there are few glimmers of hope for rapid correction in the near future.

**U.S. Air Force.** If the Army is struggling and the Navy is lost at sea, the Air Force appears to believe that threats to the United States, at least those that would have to be addressed by air power, are not

likely to manifest themselves until the 2030s. How else to explain dangerously low readiness among pilots and squadrons and the prioritization of future capabilities over ensuring that the current Air Force is able to field airpower that is relevant to current challenges?

In 2014, 17 of the service's 40 active-duty, combat-coded squadrons were temporarily shut down because of sequestration (the lopping off of funding imposed by the BCA). By 2015, the Air Force was the oldest (in average age of aircraft) and smallest it had been since becoming an independent service in 1947. The following year, the average pilot flew 150 hours or less, a significant drop from the 200-plus hours Cold War predecessors flew. By FY 2017, there were only 32 squadrons in the Active Component; only 106 F-15Cs (averaging 33 years old); fewer than 100 operationally available F-22s; and a paltry four combat-coded squadrons assessed as fully mission capable.

Conditions got worse in the following years.

By 2018, the average pilot was flying less than twice per week, and the Air Force was short 2,000 pilots. To compensate for this, in 2019, the service began to move pilots from non-flying billets to operational squadrons. Part of the problem with pilot readiness was the availability of aircraft. Limited numbers of aircraft mean limited opportunities for pilots to fly. Knowing this problem, the following year, the service oddly began to invest more in research and development for a next-generation aircraft, which it hoped would be produced in the 2030s, than in procuring greater numbers of F-35s, the only U.S. fifth-generation aircraft already in production. Investing in the latter would ameliorate the trend of the service's problems with old and unready aircraft and, therefore, its problem with pilot readiness. Instead, the service elected to spend more on future aircraft that will not be available until the late 2030s.

2018 was also the year that the service released its massive study reporting on its deep analysis of how much airpower the country needed to secure national interests. "The Air Force We Need" (TAFWN) called for a larger force and for pilots to fly more to be more proficient. This would mean a larger budget. The Trump Administration supported this, increasing the Air Force budget 31 percent over the FY 2017–FY 2021 years. In spite of this, U.S. Air Force procurement of aircraft remained

flat while research, development, test, and evaluation (RDT&E) more than doubled. In spite of *current* need as documented by the Air Force itself, the service invested in the future to have a capability that might take 10 years or more to realize rather than addressing its current problems.

In FY 2022, procurement shrank an additional 10 percent, dropping from \$28.4 billion to \$25.6 billion, while RDT&E climbed to 70 percent more than procurement. The number of readily available combat-coded fighters dropped to 885, the average age of all aircraft rose to 29.4 years, and the average fighter pilot flew only 2.5 hours per week. This translates into an embarrassing 129 hours per year, which is significantly less than the number needed to obtain, much less maintain, combat proficiency. According to the Air Force's FY 2024 budget documents, funding for flying supported 1.07 million flying hours, 8 percent less than was funded during the locust years of sequestration. But the service has shown itself unable to fly even those hours. In 2022, the service failed to fly 23,000 hours because it funded (and continues to fund) just 85 percent of the spare parts needed to fly the 1.12 million flying hours funded in that year.

If it adheres to its current trajectory, the Air Force will reduce its fleet by almost 25 percent over the next five years. Alarming, the average age of aircraft has risen to 30 years; F-15Cs are now at 38 years; the KC-135 refueling fleet averages more than 60 years; and the service's replacement refueler, the KC-46, continues to be plagued by technical problems, which means 23 percent of the fleet will be unavailable until the late 2030s.

As currently postured, the Air Force's fleet of air superiority fighters is one-fifth the size of its Cold War ancestor: 81 operationally available F-22s compared to 400 F-15Cs. And the service is still short 650 pilots.

**U.S. Marine Corps.** Of the services, the Marine Corps appears to have the firmest grasp of what it needs to be and what it needs to do to be prepared for war. Though generating controversy within its retired community, the Corps' Force Design 2030 (FD 2030) project has established a rationale and objectives for substantial change across the service driven by changes in the threat environment, the evolution of combat-relevant technologies, and a determination to return to the Corps' primary mission: projecting combat power via the sea.

Since the publication of FD 2030 in early 2020, the Corps has aggressively implemented changes that have included the introduction of unmanned air and ground systems; long-range missiles to target ground, air, and sea-based platforms; and new information-sharing tools. Adjustments in its aviation inventory have reduced the numbers of some aircraft like attack helicopters in favor of higher-end drones for surveillance and targeting, and the Corps' combat formations (most notably the infantry battalion's size, configuration, and capabilities) are being reviewed and reorganized.

The Corps' air arm is almost completely modernized—its attack helicopters replaced, a new heavy lift helicopter soon to make its debut, the old CH-46 helicopter replaced by the MV-22 Osprey, and the F-35 quickly replacing the Corps' inventory of 1980s-design AV-8B Harriers and F/A-18 Hornets. With the Corps having retired its entire inventory of tanks, the age of its ground equipment is shaped by its 1970s-vintage amphibious assault vehicles (AAV-P7, though they have been iteratively updated over the years), which have been restricted from water operations but are still useful on land; its light armored vehicle (LAV, also rather old, having been introduced in the early 1980s); and the acquisition of the amphibious combat vehicle (ACV), initially a placeholder replacement for the AAV but increasingly likely to be a primary combat vehicle for the service. Primary weapon systems for its ground force have been comprehensively updated from small arms and anti-armor weapons to artillery (cannon and rocket) and anti-air missiles. The Corps is also adding an anti-ship missile.

However, the Corps remains too small, even to be the one-war force it accepts as its role. In FY 2012, at the end of sustained operations in Iraq and the continuing mission in Afghanistan, the Corps numbered 202,000 Marines. In FY 2014, end strength and number of units began to fall: 189,000 Marines and 25 battalions in FY 2014; 184,000 in FY 2015 and FY 2016 with 23 battalions; and 177,249 Marines and 22 battalions in FY 2022.

If the Corps does indeed execute distributed, low-signature, reduced logistical demand operations with smaller units composed of slightly older, more experienced Marines, it will still need capacity to be able to sustain operations when attrition is a factor or even to compensate for lengthy operational employment close to enemy forces.

**U.S. Space Force.** In 2019, the Trump Administration, with the support of Congress, established the U.S. Space Force (USSF). All Department of Defense space capabilities, functions, support, and personnel were transferred from the Air Force, Army, and Navy and consolidated within the new service. By all accounts, the transfer of responsibilities, control of space assets—terrestrial (ground stations) and space-based (satellites)—and service to customers (for example, the geographic combatant commands) went well. The USSF's challenges come in the form of aging satellites and, akin to its sister services, a shortfall in capacity.

The plethora of space-based systems that constitute America's ability to leverage the domain have uniformly performed their functions well beyond planned service life, but there does come a point where a satellite must be replaced, and this is where U.S. space programs fall short: the timeliness of bringing new systems into service. Fortunately, the Space Development Agency, which was recently absorbed into the Space Force, has begun to field satellites at an accelerated pace, adding 23 tracking and communications satellites in the past year alone. The commercial space sector also has advanced at a remarkable pace and now launches the majority of missions for the U.S. government, but there are some functions that should remain within the control of the government, and it is in this area that concerns are mounting.

While the U.S. is still outpacing China and Russia in launches, China is gaining. In FY 2023, the U.S. launched 118 missions, China launched 24, and Russia sent 18 packages into orbit. But what these competitors say they are going to do and what they end up executing can be much different. For example, in FY 2022, China announced that it would undertake 22 launches but actually made 62.

Demand for space-based capabilities is growing at a pace that the USSF cannot currently match. Not surprisingly, the U.S. government is increasing its contracts with commercial providers to make up the difference, but the Space Force needs more assets, more people, and more funding if it is to execute its important mission properly.

**U.S. Nuclear Portfolio.** Age and capacity are common themes across defense entities, and this is certainly the case with respect to America's nuclear establishment and portfolio of capabilities. In particular, the infrastructure that undergirds all

nuclear efforts is quite old, as is the collection of people who constitute expertise in this field.

In FY 2014, nuclear modernization programs were moribund. There was a broad consensus that the viability of America's nuclear deterrent depended on assurances that the various components would work as intended when needed. This included the weapons themselves; delivery vehicles (aircraft and missiles); testing apparatus; manufacturing facilities; and the pool of people with the required expertise. The areas of understanding and technical assurance began to generate doubts within a little more than a decade after the U.S. self-imposed a moratorium on yield-producing experiments.

"[I]n the past," according to the late Major General Robert Smolen, some of the nuclear weapon problems that the U.S. now faces "would have [been] resolved with nuclear tests." By 2005, a consensus emerged in the NNSA, informed by the nuclear weapons labs, that it would "be increasingly difficult and risky to attempt to replicate exactly existing warheads without nuclear testing and that creating a reliable replacement warhead should be explored." When the U.S. did conduct nuclear tests, it frequently found that small changes in a weapon's tested configuration had a dramatic impact on weapons performance. In fact, the 1958–1961 testing moratorium resulted in weapons with serious problems being introduced into the U.S. stockpile.<sup>28</sup>

The U.S. has not conducted a yield-producing experiment since 1992. In 2018, the Trump Administration's Nuclear Posture Review (NPR) recognized that China and Russia were actively exploring new weapon designs—something the U.S. was *not* doing. In 2020, the nuclear establishment was required to be able to conduct a nuclear test within 24 to 36 months of being tasked with doing so. However, the continued deterioration of technical and diagnostic equipment and the inability of the National Nuclear Security Administration (NNSA) to fill technical positions created substantial doubt that this could be done. At that point, more than 40 percent of the workforce was eligible for retirement over the next five years, highlighting the talent-management problem within the nuclear enterprise.

The *2022 Index* reported on the problematic nature of a tripolar world. China was working to expand its nuclear weapons capacity to more than twice its current size by the end of the decade. Russia was consistently violating various non-proliferation and nuclear arms reduction treaties and was committed to developing new designs for weapons at all levels of use: tactical, operational, and strategic. Against the backdrop of China's and Russia's aggressive modernization, the U.S. was mired in policy debates, self-imposed restraints, inadequate funding, and a persistent degradation of facilities, talent, and production capabilities throughout the nuclear establishment.

By 2023, Russia had ended any pretense of adhering to New START, formally suspending its commitment to the treaty. China was now known to be tripling its ICBM launch capacity. Some reports had emerged that Iran was enriching uranium to 83.7 percent purity (just shy of the 90 percent needed for a weapon) and probably had enough fissile material for at least one bomb.<sup>29</sup> Happily, Congress was continuing a few years of strong support for U.S. nuclear modernization; whether that continues remains to be seen.

At present, nuclear options are too limited, the U.S. nuclear knowledge base is increasingly theoretical and academic rather than drawn from experience, and the workforce continues to age. Although the various components are relatively healthy at present—delivery vehicles, exercises and testing, a few modernization programs underway, and renewed interest in both the executive and legislative branches—there is no margin for delay or error when it comes to the viability and assuredness of America's nuclear weapons portfolio.

**Missile Defense.** "By successive choices of post-Cold War Administrations and Congresses," the *2019 Index* reported, "the United States does not have in place a comprehensive ballistic missile defense system that would be capable of defending the homeland and allies from ballistic missile threats." Instead, "U.S. efforts have focused on a limited architecture protecting the homeland and on deploying and advancing regional missile defense systems."<sup>30</sup>

In 2018, America's missile defense capability was beset by limited investment, canceled programs, and limited capacity to handle multiple targets and was mostly focused on a very limited threat from

one direction (North Korea) and perhaps a limited strike from China.<sup>31</sup> The U.S. possessed no ability to intercept a missile in its boost phase and still has no such ability in 2023. Funding, a reflection of policy and interest, has been volatile and inconsistent, varying from one year to the next and subject to change.

By 2021, China, Russia, and North Korea were investing in multiple independently targeted re-entry vehicle (MIRV) options, cruise missiles equipped with nuclear warheads, advanced decoys, and countermeasures that make a successful intercept more complicated. The more advanced competitors—China and Russia—were also making progress with hypersonic glide vehicle programs.

In March 2023, General Glen VanHerck, Commander, U.S. Northern Command and North American Aerospace Defense Command, testified that North Korea had “tested at least 65 conventional theater and long-range nuclear capabilities over the last year.” Iran tested a 2,000-kilometer ballistic missile and displayed what was advertised as a hypersonic missile. In 2021, China was known to have tested a fractional orbital bombardment system (FOBS) that included a deployable hypersonic glide vehicle (HGV), enabling China to launch the weapon into space and keep it in low earth orbit until ready for a de-orbital maneuver to use the maneuverable HGV to attack a target.<sup>32</sup> Lacking any predictable trajectory as would be the case with a conventional ballistic missile, an HGV makes intercepting the weapon extremely difficult.

Efforts are being made to improve the U.S. missile defense posture at locations in Europe, Guam, and Alaska, but such efforts appear to lack a sense of urgency and robustness. They certainly do not match the pace at which adversaries are improving their ability to threaten the U.S. and its interests.

### Conclusion: A Pattern of Substantial Erosion

The upshot to all of this—the trends seen across all of the military services and critical enablers like missile defense and the strategic deterrent provided by nuclear weapons—is that U.S. military strength has substantially eroded over the past decade.

- All elements have shrunk in capacity,
- Nearly all platform-based capabilities have grown older, and

- Most functional components have become less ready.

Where the United States would have been able to engage Soviet forces on a global scale in the 1980s, the current U.S. military would be hard-pressed to handle a single major conflict. To repeat an earlier point, if U.S. allies were strong, ready, and competent, shortfalls in the American military portfolio might not be so worrisome; the same would be true if America’s competitors were weak or less aggressive. But on both counts—among both allies and competitors—trends do not favor U.S. interests and make the military’s weakened state all the more alarming.

If the U.S. is to protect its interests, it must have a military that is large enough, modern enough, and ready enough to be equal to the task and relevant to the nature of the world *as it is today*, not 10 or 20 years from now. If the U.S. is to shape world affairs to suit its interests instead of merely reacting to significant changes, thus ceding initiative and opportunity to opponents, it must possess the means to deter bad behavior, reassure friends and allies, and defeat enemies that actively threaten the U.S. homeland, Americans abroad, and America’s economic, political, and security interests in regions that are key to its future.

At present, the condition of the U.S. military introduces substantial risk in all of these areas.

As is true of any other crisis—an automobile accident, storm damage, or a medical emergency—the time, place, and severity of war cannot be predicted, but we know they happen. The prudent person prepares for such eventualities by investing in insurance, adopting healthy and safe practices, or stockpiling to mitigate the consequences of a significant disruption. Throughout its history, the U.S. has found itself at war about every 15 to 20 years: The record is indisputable. Wars can occur because of policy decisions (wars of choice) or because they are forced on the U.S. by, for example, threats to key interests or by treaty obligations (wars of necessity). In either case, either the country is ready or it isn’t.

At present, the country is not ready, at least not to the extent that it might mitigate the profound costs of a large war. Weakness may be provocative as well, tempting would-be aggressors to take actions or to accept risks from which they might otherwise have been deterred.



TABLE 1

## Index Scores Over Time (Page 1 of 4)

|                               | 2015        | 2016        | 2017      | 2018      | 2019        | 2020        | 2021        | 2022        | 2023        | 2024        |
|-------------------------------|-------------|-------------|-----------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
| Overall Power Score           | Marginal    | Marginal    | Marginal  | Marginal  | Marginal    | Marginal    | Marginal    | Marginal    | Weak        | Weak        |
| <b>OPERATING ENVIRONMENT</b>  |             |             |           |           |             |             |             |             |             |             |
| Overall Operating Environment | Moderate    | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| <b>Europe</b>                 |             |             |           |           |             |             |             |             |             |             |
| Alliances                     | Favorable   | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Excellent   | Excellent   |
| Political Stability           | Favorable   | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Excellent   |
| U.S. Military Posture         | Moderate    | Moderate    | Moderate  | Moderate  | Moderate    | Moderate    | Moderate    | Moderate    | Favorable   | Favorable   |
| Infrastructure                | Favorable   | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| Overall                       | Favorable   | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| <b>Middle East</b>            |             |             |           |           |             |             |             |             |             |             |
| Alliances                     | Moderate    | Favorable   | Moderate  | Moderate  | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    |
| Political Stability           | Unfavorable | Unfavorable | Very Poor | Very Poor | Unfavorable | Unfavorable | Unfavorable | Unfavorable | Unfavorable | Unfavorable |
| U.S. Military Posture         | Moderate    | Moderate    | Moderate  | Moderate  | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    |
| Infrastructure                | Moderate    | Moderate    | Moderate  | Moderate  | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    |
| Overall                       | Moderate    | Moderate    | Moderate  | Moderate  | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    | Moderate    |
| <b>Asia</b>                   |             |             |           |           |             |             |             |             |             |             |
| Alliances                     | Favorable   | Excellent   | Excellent | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| Political Stability           | Moderate    | Moderate    | Favorable | Moderate  | Favorable   | Favorable   | Moderate    | Moderate    | Moderate    | Moderate    |
| U.S. Military Posture         | Moderate    | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| Infrastructure                | Moderate    | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |
| Overall                       | Moderate    | Favorable   | Favorable | Favorable | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   | Favorable   |

TABLE 1

## Index Scores Over Time (Page 2 of 4)

|  | 2015         | 2016         | 2017       | 2018       | 2019       | 2020       | 2021       | 2022       | 2023       | 2024       |
|--|--------------|--------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>THREAT</b>                          |              |              |            |            |            |            |            |            |            |            |
| Overall Threat                         | Elevated     | Elevated     | High       | High       | High       | High       | High       | High       | High       | High       |
| <b>Russia</b>                          |              |              |            |            |            |            |            |            |            |            |
| Behavior                               | Aggressive   | Aggressive   | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Hostile    |
| Capability                             | Gathering    | Gathering    | Formidable | Formidable | Formidable | Formidable | Formidable | Formidable | Formidable | Formidable |
| Threats to U.S. Vital Interests        | High         | High         | High       | High       | High       | High       | High       | High       | High       | High       |
| <b>Iran</b>                            |              |              |            |            |            |            |            |            |            |            |
| Behavior                               | Aggressive   | Aggressive   | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive |
| Capability                             | Aspirational | Aspirational | Gathering  | Gathering  | Gathering  | Gathering  | Gathering  | Gathering  | Gathering  | Gathering  |
| Threats to U.S. Vital Interests        | Elevated     | Elevated     | High       | High       | High       | High       | High       | High       | High       | High       |
| <b>Middle East Terrorism/Non-State</b> |              |              |            |            |            |            |            |            |            |            |
| Behavior                               | Aggressive   | Aggressive   | Hostile    | Aggressive | Hostile    | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive |
| Capability                             | Aspirational | Aspirational | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    |
| Threats to U.S. Vital Interests        | Elevated     | Elevated     | High       | High       | High       | High       | High       | High       | High       | High       |
| <b>Af-Pak Terrorism</b>                |              |              |            |            |            |            |            |            |            |            |
| Behavior                               | Aggressive   | Aggressive   | Testing    | Aggressive | Testing    | Testing    | Testing    | Testing    | Testing    | Testing    |
| Capability                             | Capable      | Gathering    | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    | Capable    |
| Threats to U.S. Vital Interests        | Elevated     | High         | High       | High       | Elevated   | Elevated   | Elevated   | Elevated   | Elevated   | Elevated   |
| <b>China</b>                           |              |              |            |            |            |            |            |            |            |            |
| Behavior                               | Aggressive   | Aggressive   | Aggressive | Testing    | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive | Aggressive |
| Capability                             | Gathering    | Gathering    | Gathering  | Formidable | Formidable | Formidable | Formidable | Formidable | Formidable | Formidable |
| Threats to U.S. Vital Interests        | High         | High         | High       | High       | High       | High       | High       | High       | High       | High       |

TABLE 1

## Index Scores Over Time (Page 3 of 4)

2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

### THREAT (CONT.)

#### North Korea

|                                 |            |           |            |            |           |           |           |            |           |
|---------------------------------|------------|-----------|------------|------------|-----------|-----------|-----------|------------|-----------|
| Behavior                        | Aggressive | Hostile   | Aggressive | Aggressive | Testing   | Testing   | Testing   | Aggressive | Testing   |
| Capability                      | Capable    | Gathering | Gathering  | Gathering  | Gathering | Gathering | Gathering | Gathering  | Gathering |
| Threats to U.S. Vital Interests | Elevated   | Severe    | High       | High       | High      | High      | High      | High       | High      |

### POWER

#### U.S. Army

|            |          |          |          |          |             |             |             |             |             |
|------------|----------|----------|----------|----------|-------------|-------------|-------------|-------------|-------------|
| Capacity   | Marginal | Weak     | Weak     | Weak     | Weak        | Weak        | Weak        | Weak        | Weak        |
| Capability | Marginal | Marginal | Marginal | Marginal | Marginal    | Marginal    | Marginal    | Marginal    | Marginal    |
| Readiness  | Weak     | Weak     | Weak     | Strong   | Very Strong | Very Strong | Very Strong | Very Strong | Very Strong |
| Overall    | Marginal | Weak     | Weak     | Marginal | Marginal    | Marginal    | Marginal    | Marginal    | Marginal    |

#### U.S. Navy

|            |          |          |          |          |          |          |          |          |           |
|------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Capacity   | Marginal | Marginal | Marginal | Marginal | Weak     | Weak     | Weak     | Weak     | Very Weak |
| Capability | Weak     | Weak     | Weak     | Weak     | Marginal | Marginal | Marginal | Marginal | Marginal  |
| Readiness  | Strong   | Marginal | Strong   | Marginal | Marginal | Marginal | Marginal | Marginal | Weak      |
| Overall    | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Weak      |

#### U.S. Air Force

|            |          |             |          |          |          |          |          |           |           |
|------------|----------|-------------|----------|----------|----------|----------|----------|-----------|-----------|
| Capacity   | Strong   | Very Strong | Strong   | Marginal | Marginal | Marginal | Marginal | Marginal  | Marginal  |
| Capability | Marginal | Marginal    | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal  | Marginal  |
| Readiness  | Strong   | Marginal    | Marginal | Marginal | Weak     | Marginal | Weak     | Very Weak | Very Weak |
| Overall    | Strong   | Marginal    | Marginal | Marginal | Marginal | Marginal | Marginal | Very Weak | Very Weak |

TABLE 1

## Index Scores Over Time (Page 4 of 4)

|                                  | 2015     | 2016     | 2017     | 2018     | 2019     | 2020     | 2021     | 2022     | 2023     | 2024     |
|----------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>POWER (CONT.)</b>             |          |          |          |          |          |          |          |          |          |          |
| <b>U.S. Marine Corps</b>         |          |          |          |          |          |          |          |          |          |          |
| Capacity                         | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     | Marginal | Marginal | Weak     | Weak     |
| Capability                       | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Strong   | Strong   | Strong   |
| Readiness                        | Marginal | Marginal | Marginal | Weak     | Weak     | Marginal | Marginal | Strong   | Strong   | Strong   |
| Overall                          | Marginal | Marginal | Marginal | Weak     | Weak     | Marginal | Marginal | Strong   | Strong   | Strong   |
| <b>U.S. Nuclear</b>              |          |          |          |          |          |          |          |          |          |          |
| Warhead Surety/Nuclear Stockpile | Marginal | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   |
| Delivery Platform Reliability    | Strong   | Strong   | Strong   | Strong   | Marginal | Marginal | Strong   | Strong   | Strong   | Marginal |
| Warhead Modernization            | Weak     | Weak     | Weak     | Weak     | Weak     | Marginal | Marginal | Marginal | Marginal | Marginal |
| Delivery Systems Modernization   | Weak     | Weak     | Marginal | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   |
| Nuclear Weapons Complex          | Weak     | Weak     | Weak     | Weak     | Weak     | Marginal | Marginal | Marginal | Marginal | Marginal |
| National Labs Talent             | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal |
| Force Readiness                  | Marginal | Marginal | Marginal | Marginal | Marginal | Strong   | Strong   | Strong   | Strong   | Marginal |
| Allied Assurance                 | Strong   | Marginal | Marginal | Marginal | Strong   | Strong   | Strong   | Strong   | Strong   | Strong   |
| Nuclear Test Readiness           | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     | Weak     |
| Overall                          | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Marginal | Strong   | Strong   | Marginal |
| <b>U.S. Space Force</b>          |          |          |          |          |          |          |          |          |          |          |
| Capacity                         |          |          |          |          |          |          |          | Weak     | Weak     | Marginal |
| Capability                       |          |          |          |          |          |          |          | Weak     | Weak     | Marginal |
| Readiness                        |          |          |          |          |          |          |          | Weak     | Weak     | Marginal |
| Overall                          |          |          |          |          |          |          |          | Weak     | Weak     | Marginal |

**SOURCE:** Dakota L. Wood, ed., *2024 Index of U.S. Military Strength* (Washington: The Heritage Foundation, 2024), <https://www.heritage.org/military>.



Ten years of assessing the deteriorating condition of the U.S. military reveals that short-term political interests almost always displace sustained annual and key long-term investments that are essential to ensuring the viability and effectiveness of military power. This is true not just for the U.S., but even more so for important allies who have allowed their military establishments to decline to dangerous states of unreadiness. Sometimes, a quick injection of attention or funding can result in rapid, positive change, but this is not the case when it comes to military strength. It takes years to build a ship, to recruit and train a soldier, to have pilots who are competent in aerial battle against a capable enemy, and to have larger formations that

are effective in joint and combined operations undertaken far from home and that include battle in all domains. When war does happen, desired forces that should be in place a decade in the future are irrelevant. What matters is what the U.S. has at hand in the moment of danger.

The Heritage Foundation's *Index of U.S. Military Strength* has methodically and meticulously tracked and reported the declining state of America's military establishment for a decade. We hope that senior leaders in our government and the American people will take notice and take action to correct this trend and ensure the best possible future both for the American people and for the free world at large.

# Appendix

## **The *Index of U.S. Military Strength*, 2015–2024**

- *2015 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2015), [http://ims-2015.s3.amazonaws.com/2015\\_Index\\_of\\_US\\_Military\\_Strength\\_FINAL.pdf](http://ims-2015.s3.amazonaws.com/2015_Index_of_US_Military_Strength_FINAL.pdf).
- *2016 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2015), [https://s3.amazonaws.com/ims-2016/PDF/2016\\_Index\\_of\\_US\\_Military\\_Strength\\_FULLL.pdf](https://s3.amazonaws.com/ims-2016/PDF/2016_Index_of_US_Military_Strength_FULLL.pdf).
- *2017 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2016), [http://ims-2017.s3.amazonaws.com/2017\\_Index\\_of\\_Military\\_Strength\\_WEB.pdf](http://ims-2017.s3.amazonaws.com/2017_Index_of_Military_Strength_WEB.pdf).
- *2018 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2018), [https://www.heritage.org/sites/default/files/2017-10/2018\\_IndexOfUSMilitaryStrength-2.pdf](https://www.heritage.org/sites/default/files/2017-10/2018_IndexOfUSMilitaryStrength-2.pdf).
- *2019 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2019), [https://www.heritage.org/sites/default/files/2018-09/2019\\_IndexOfUSMilitaryStrength\\_WEB.pdf](https://www.heritage.org/sites/default/files/2018-09/2019_IndexOfUSMilitaryStrength_WEB.pdf).
- *2020 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2020), [https://www.heritage.org/sites/default/files/2019-11/2020\\_IndexOfUSMilitaryStrength\\_WEB.pdf](https://www.heritage.org/sites/default/files/2019-11/2020_IndexOfUSMilitaryStrength_WEB.pdf).
- *2021 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2021), [https://www.heritage.org/sites/default/files/2020-11/2021\\_IndexOfUSMilitaryStrength\\_WEB\\_0.pdf](https://www.heritage.org/sites/default/files/2020-11/2021_IndexOfUSMilitaryStrength_WEB_0.pdf).
- *2022 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2022), [https://www.heritage.org/sites/default/files/2021-09/2022\\_IndexOfUSMilitaryStrength.pdf](https://www.heritage.org/sites/default/files/2021-09/2022_IndexOfUSMilitaryStrength.pdf).
- *2023 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2023), [http://thf\\_media.s3.amazonaws.com/2022/Military\\_Index/2023\\_IndexOfUSMilitaryStrength.pdf](http://thf_media.s3.amazonaws.com/2022/Military_Index/2023_IndexOfUSMilitaryStrength.pdf).
- *2024 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2024).

## Endnotes

1. The U.S. possesses 274 cargo aircraft capable of long-range heavy lift. Other countries that possess a similar ability include the United Kingdom, France, Germany, Spain, Qatar, and the United Arab Emirates, among others but in limited numbers. The U.S. inventory of long-range heavy lift cargo aircraft is 10 times that of any ally or partner nation. European countries most often fly the A400M, a turbo-prop cargo aircraft with a range of 2,000 miles, roughly comparable to the U.S. C-17, a jet-powered cargo aircraft but with one-quarter the payload. Russia and China possess 125 and 70 heavy lift aircraft, respectively. U.S. inventory taken from *2023 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2023), p. 403, [https://www.heritage.org/sites/default/files/2022-10/2023\\_IndexOfUSMilitaryStrength.pdf](https://www.heritage.org/sites/default/files/2022-10/2023_IndexOfUSMilitaryStrength.pdf). All other quantities taken from International Institute for Strategic Studies, *The Military Balance 2023: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2023), pp. 191 (Russia) and 243 (China), p. 243, <https://www.iiss.org/contentassets/2209ee34637145989abcaed66e35967d/mb2023-book.pdf> (accessed September 10, 2023).
2. Sébastien Roblin, “As Losses Mount, Russia Is Reactivating Soviet-Era T-54 Tanks. That Says So Much,” *Popular Mechanics*, March 24, 2023, <https://www.popularmechanics.com/military/weapons/a43392278/russia-reactivating-t54-tanks-ukraine/> (accessed September 10, 2023).
3. Jeff Schogol, “Russia Is Hammering Ukraine with up to 60,000 Artillery Shells and Rockets Every Day,” *Task & Purpose*, June 13, 2022, <https://taskandpurpose.com/news/russia-artillery-rocket-strikes-east-ukraine/> (accessed September 10, 2023).
4. Associated Press and ABC [Australian Broadcasting Corporation] News, “Why the Hard-Hitting 155mm Howitzer Is Crucial to Ukraine’s Struggle Against Russian Invasion,” April 25, 2023, <https://www.abc.net.au/news/2023-04-26/155-mm-howitzer-round-ukraine-war/102263322> (accessed September 10, 2023).
5. A statement often attributed to Joseph Stalin, although this is disputable.
6. See Appendix, “The *Index of U.S. Military Strength*, 2015–2024,” *infra*. The appendix includes links to all previous editions of the *Index*. Because all are available in readily accessible pdf format, and because including citations for every reference drawn from the 10 years of the *Index* would add unnecessarily to the length of this essay, we have elected (except for quoted material) to include citations only for non-*Index* sources that might not be as familiar to the general reader.
7. Shannon Collins, “Desert Storm: A Look Back,” U.S. Department of Defense, January 11, 2019, <https://www.defense.gov/News/Feature-Stories/story/Article/1728715/desert-storm-a-look-back/> (accessed September 10, 2023).
8. Serena Seyfort, “Explainer: What Are China’s ‘Artificial Islands’ and Why Are There Concerns About Them,” 9News [Australia], November 26, 2021, <https://www.9news.com.au/world/what-are-chinas-artificial-islands-in-the-south-china-sea-and-why-are-there-concerns-about-them/3f0d47ab-1b3a-4a8a-bfc6-7350c5267308> (accessed September 10, 2023).
9. Reuters, “China Formally Opens First Overseas Military Base in Djibouti,” August 1, 2017, <https://www.reuters.com/article/us-china-djibouti-idUSKBNIAH3E3> (accessed September 10, 2023).
10. Bloomberg, “Explainer: What Is the Bab el-Mandeb Strait and Why Is It Important?” gCaptain, July 26, 2018, <https://gcaptain.com/explainer-what-is-the-bab-el-mandeb-strait-and-why-is-it-important/> (accessed September 10, 2023).
11. The Chinese now have more J-20s than the U.S. has F-22s, and their production line is expected to deliver 120 J-20s in 2023, more than twice the number of F-35s the U.S. Air Force will acquire this year. See Editorial Staff, “China’s Air Force Surges J-20 Stealth Fighter Acquisitions to 120+ Annually: USAF Receiving Just 48 F-35s,” *Military Watch Magazine*, July 20, 2023, <https://militarywatchmagazine.com/article/china-surge-j20-120-f35s-48> (accessed September 13, 2023).
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# The Role of the Military in U.S. History: Past, Present, and Future

James Jay Carafano

**T**he rise of professional militaries in the West is credited with accelerating the process of creating the modern nation-state. In addition to defending the state from external threats, professional armed forces performed internal security, public safety, and administrative functions that helped to establish the legitimacy of its sovereignty.

The United States stood as an exception to that trend. While a professional army was assembled to help win independence from England, it did not help to create the U.S. This was accomplished by the people. In the new republic, national sovereignty was reserved for the people. The government's armed forces, like all of the other instruments of national power, were to be servants of the people, not a means with which to govern them. This concept is foundational to the roles, missions, and actions of the U.S. armed forces past, present, and future. Nevertheless, as the nation evolved, so did the scope and activities of the American military.

## Birth of the Republic

Defining appropriate civil–military relations was foundational to the establishment of the United States. The principles for organizing military force were largely drawn from British history, culture, legal concepts, and tradition.

The experience of Britain in the state-formation period of the 17th and 18th centuries was unique. In almost every other instance, militaries emerged as important instruments of domestic control as well as weapons of war. This evolution was not unique to Europe. It was also common in Latin America as well as parts of Africa and Asia. In places where great empires did not have dominion, rulers had

limited capacity to marshal military forces either for military campaigns or for internal security. Rulers could either call for levies from lords or assemble militias on the one hand or contract for mercenaries on the other. Neither solution was particularly satisfying to sovereign powers because not completely controlling armed forces compromised both their power and their legitimacy.

The Italian scholar Niccolò Machiavelli (1469–1527) struggled with the dilemma of the pursuit of power in his political and military writings. He decried mercenaries as rapacious and unreliable.<sup>1</sup> He argued for an army of citizen-soldiers<sup>2</sup> who would virtuously serve the state, an idea that at the time was well-meant but impractical. What most states did instead was mass resources that allowed for temporary standing armies—either of conscripts or of rented forces from foreign powers like the German Landsknechte.

As the constitutional character of the British state evolved, however, history led Albion on a different path. During the English Civil War (1642–1651), the crown used both the professional army and hired foreign troops to prosecute the war against the forces mustered by a revolt led by leaders in Parliament. After an interregnum (1649–1660), the crown was restored, but James II abdicated in 1688 over another confrontation with Parliament. The Bill of Rights issued when William and Mary were offered the crown enshrined that foreign troops should not be stationed on British soil, the military should be raised only by Parliament, and only a limited standing army should be stationed in Britain and never mobilized against the British people.<sup>3</sup> This enshrined in law the concept of “no

standing armies” as well as the rationale for checks and balances so that the government could never use the armed forces as an instrument of tyranny against the people.

It was the British “no standing armies” tradition and the republican concept of the citizen-soldier envisioned by Machiavelli that together served as the intellectual foundation for the American armed forces. The practical lessons from decades of armed warfare between nation-states in Europe, the Americas, and Asia were also considered in deciding how to organize the American armed forces. While the Americans wanted civilian control of the military, they also wanted armed forces that could fight and win. This meant that land and sea forces needed to be under unified military commands that could muster professional troops and matériel for extended campaigns and employ them as effectively as possible.

Thus, during the American Revolution in 1775, the Continental Congress commissioned George Washington as commander in chief of the Continental Army.<sup>4</sup> Meanwhile, the Congress assumed responsibility for raising and supporting a professional army and naval forces instead of just relying on the colonial volunteer militias to fight for independence.

At the end of the war, the Continental Army watched from their cantonment at Newburgh in upstate New York, waiting for the final peace treaty between the United States of America and the United Kingdom and the evacuation of British forces. There was great consternation in the ranks that the Congress had not delivered on many of the promises made to enlistees. Some argued that the military should refuse to disband until their grievances were addressed or even march on the Continental Congress. Washington quelled the mutiny,<sup>5</sup> his principal argument being that their loyalty to the nation and to the appointed civilian leaders in the Continental Congress transcended their personal interests.

The practical lessons of the American Revolution did as much as the intellectual scholarship of writers like Machiavelli, John Locke, and others to shape the drafting of the U.S. Constitution that was finally ratified in 1788.<sup>6</sup> The foundational document had a great deal to say about the roles, missions, and oversight of the armed forces. In fact, there is more articulation of stated and enumerated powers

related to defense in the Constitution than there is about any other function of government.<sup>7</sup>

The Constitution enshrined civilian control of the military by making the President the commander in chief of the armed forces.<sup>8</sup> This was more than a symbolic appointment. Below the level of the President, to this day, no single officer has command authority over all U.S. military forces.

In addition to ensuring unity of command and effort in wartime, the Constitution gave Congress the authority and responsibility for raising and maintaining national military forces,<sup>9</sup> thereby limiting the power of the executive to use or maintain armed forces independently, without reference to Congress. Congress authorized creation of today’s Army (under the Secretary of War) in 1789;<sup>10</sup> Navy (under the Secretary of the Navy) in 1794;<sup>11</sup> and Marine Corps (serving within the Department of the Navy and under the Secretary) in 1798.<sup>12</sup>

The Constitution also authorized individual states to raise and maintain militias.<sup>13</sup> This authority was granted partly because the Congress assumed that there would be a small standing Army and Navy in peacetime with most internal security tasks addressed by the states themselves. Laws later evolved for state forces to work in concert with or under the national government. During the War of 1812, for instance, Andrew Jackson had a commission as a major general in the regular United States Army and command of the Seventh Military District. He organized the defense of New Orleans with a combination of militias, volunteers, and a handful of professional forces.

Thus, since the earliest days of the republic, Americans proactively sought to implement all of the concepts they thought essential for the armed forces of a republican state with civilian control, limited professional militaries in peacetime, and armed forces focused on defending against external threats rather than being employed for internal security. The armed forces were primarily for foreign threats and constabulary duties in frontier territories and on U.S. borders. President Thomas Jefferson, for example, deployed naval and Marine forces to safeguard U.S. interests against the states of North Africa. The United States fought two separate wars with Tripoli (1801–1805) and Algiers (1815–1816) and maintained a Mediterranean Squadron in theater that has continued in different iterations down to the present day.

That said, however, the Constitution did not prohibit the use of armed forces in a domestic theater under extraordinary circumstances.<sup>14</sup> George Washington as the first President demonstrated that authority in 1794 when he called out troops under federal authority to quell the Whiskey Rebellion, a series of violent protests against the first excise tax imposed by the new government. At the time, before troops could be raised, the Militia Act of 1792 required a Supreme Court associate justice or “the district judge” to certify that law enforcement was beyond the control of local authorities.<sup>15</sup> After that determination, Washington issued a proclamation announcing that the militia would be called out under his command. The troops dispersed the insurrectionists.

In responding to the Whiskey Rebellion, the President declared that he was acting with “deepest regret” and that the military was being employed to restore civil order, not as a political instrument.<sup>16</sup> As President, Jefferson likewise looked to policies demonstrating that military forces were national instruments not to be used to further political interests. For instance, when the U.S. government built its first complement of frigates for the Navy, it ordered that contracts be distributed to several ports in different states to demonstrate that the Administration was not picking favorites. Jefferson established the first federal military academy at West Point in 1802 and distributed appointments among all the states to create opportunities for both political parties to contribute to the Army’s officer corps, ensuring that no single political faction dominated the ranks of regular Army officers.<sup>17</sup>

The structural decisions made to organize national defense ensured an effective military without consolidating political control of the armed forces. In this respect, the U.S. overcame the principal critique over the capacity of republics to defend themselves, highlighted in Alex de Tocqueville’s *Democracy in America*.<sup>18</sup> De Tocqueville had many nice things to say about the new nation and the concept of democracy, but he wondered whether a representative republic could fight wars and deal with protracted security challenges without collapsing over internal squabbling and political factions in a government where authority was divided and organized to provide checks and balances against the independent use of force by the executive.

## From the West to the Western Hemisphere and the World

Experience proved that the U.S. could use armed forces decisively to protect itself. In this respect, as the republic grew, strategy and interests did as much as the political constructs laid out in the Constitution to shape the roles and missions of the armed forces.

Again, Washington’s action proved formative in developing and employing the armed forces. From the birth of the republic, there was a ferocious debate between political factions over how to defend the new nation. At the time, the global geopolitics that largely affected the fledgling state was the rivalry between France and Great Britain over spheres of influence. This competition extended to the Western Hemisphere where both countries had colonial holdings as well as economic and security interests at stake.

In the U.S., one faction argued for aligning with the British. The other argued for siding with France. Washington argued for what at the time was an even more controversial decision. The U.S., he declared in his farewell address to Congress, should have “no entangling alliance,”<sup>19</sup> eschewing treaty alliances with either Paris or London. Washington did not intend to author an immutable principle of American foreign policy; Article II the Constitution specifically grants government the authority to execute treaties.<sup>20</sup> Rather, Washington was making a declaration of grand strategy: an overall expression of ends, ways, and means to secure U.S. interests over the long term.

The U.S. was a fledgling power, Washington reasoned, and the best way to secure American interests was to ensure that they were not intertwined with and overwhelmed by those of either great power (Britain and France), thereby avoiding the risk of the U.S. becoming a vassal state or being drawn into the endless wars between the rival empires. In part, this decision allowed the U.S. to maintain modest armed forces without stressing the finances of the young republic and creating a powerful government institution that might later be used to undermine democratic rule.

Washington’s choice became the orthodoxy of American grand strategy until President James Monroe advanced the Monroe Doctrine in his annual message to Congress in 1823.<sup>21</sup> Monroe argued that European powers were obligated to respect the

Western Hemisphere as the United States' sphere of interest. This new strategic formulation was grounded in America's expanding power and interests, particularly with regard to westward expansion and ensuring freedom of the seas for American shipping. Commensurately, the U.S. military added modest expeditionary capability and increased capacity to conduct constabulary operations in new territories. The most muscular employment of U.S. forces in the hemisphere was the Mexican–American War (1846–1848).

Emphasis on hemispheric defense remained the focus of the U.S. armed forces, although there were exceptions. The U.S., for example, still maintained the European Squadron in the Mediterranean; deployed an East India Squadron in 1835 (which became the Asiatic Squadron in 1868); and established the Great White Fleet, a group of Navy battleships that circumnavigated the globe from 1907 to 1909. The U.S. military also maintained a ground-force presence in China throughout the first decade of the 20th century in addition to forces in the Philippines.

Hemispheric defense, however, remained the U.S. military's dominant focus. The armed forces, for instance, were called upon for a punitive expedition in Mexico (1916–1917). The American occupation of Haiti from 1915 to 1934 was justified in part as an attempt to secure avenues of approach to the United States through the Caribbean. Even the U.S. intervention in World War I was justified as based on hemispheric defense, predicated on the need for preemptive action to counter the likelihood of invasion by the German Empire and Mexico.

In fact, until the Japanese attack on Pearl Harbor in 1941, which triggered U.S. entry into World War II, hemispheric defense remained the guiding strategy behind the missions, structure, and manning of the American armed forces.

By the end of World War II, the U.S. had emerged incontestably as a global power with global interests and responsibilities. Strategy was largely structured around fighting the Cold War with the Soviet Union included establishing an independent Air Force branch; building strategic forces (nuclear-armed missiles, bombers, and submarines); permanently stationing major forces overseas; maintaining a global military command structure; and investing in expansive treaty alliances, principally NATO.

With the collapse of the Soviet Union in the early 1990s, the crafting of a consensus global grand

strategy became difficult, but the U.S. still recognized that it needed armed forces with global reach and the capacity to conduct extended campaigns.

The September 11, 2001, terrorist attacks renewed concerns about the defense of the home front and engendered a persistent need for security not seen except in wartime since the early days of the republic, although the military traditionally had provided support to civil authorities—for example, in response to the great San Francisco earthquake of 1906. In another example, in 1929, the city of Tacoma, Washington, experienced a massive power outage.<sup>22</sup> The Department of the Navy ordered the USS *Lexington* to respond, and the ship's four giant generators helped to provide electricity for the next several weeks. Only after 9/11, however, did the mission of homeland defense become integral to long-term U.S. strategy.

### Strategy vs. Reality

While strategic needs have generally defined the scope, size, and missions of the military over the course of U.S. history, there is a saying: “Strategy can change faster than foster structure.” In other words, sudden changes in the geostrategic environment can occur that reveal inadequacy in force planning or introduce dramatic and unanticipated new demands.

The American Civil War (1861–1865) is perhaps the starkest example. For the first half-century of the republic, the armed forces mostly conducted constabulary duties and punitive expeditions on the frontier. It was never envisioned that the military would be required to conduct major campaigns or even operations in a domestic context. When the secession of the southern states plunged the country into conflict, the armed forces had to adapt rapidly, including by employing national conscription to fill the ranks.

The Civil War also saw the first widespread deployment of persons of color in the U.S. Army. By the end of the Civil War, roughly 179,000 black men (10 percent of the force) served in the Union Army. Another 19,000 served in the U.S. Navy.<sup>23</sup> After the war, blacks continued to serve in segregated units. The most famous were the “Buffalo Soldiers,” cavalry units that served on the American frontier. Buffalo soldiers also fought in the Spanish–American War and served in the Philippines.<sup>24</sup>

Another significant departure from tradition was the use of soldiers as federal marshals during

Reconstruction. During the presidential election of 1876, President Ulysses S. Grant dispatched troops to polling stations in South Carolina, Louisiana, and Florida, where electoral votes remained in dispute. Reflecting the ongoing national debate between security and government power within the United States and the appropriate use of the armed forces, this measure precipitated calls for the passage of the Posse Comitatus Act of 1878,<sup>25</sup> which prohibited federal troops from enforcing state or federal laws without congressional approval.

Reconstruction was not the first and would not be the last time that the armed forces became mired in political and social controversies. Despite Posse Comitatus, during the 19th century, military forces were often called upon to restore public order. For example, between 1875 and 1918, state militias or federal troops were called out to respond to labor unrest over one thousand times.

Unfortunately, although the armed forces were intended for hemispheric defense, the chaotic attempts to launch an invasion force from Tampa, Florida, proved that the U.S. Army was not up to the task of executing an expeditionary campaign in Cuba during the Spanish–American War in 1898. Further, the War Department struggled to integrate active-duty forces, state militias, and volunteer units. In response, the U.S. Congress passed the Militia Act of 1903<sup>26</sup> establishing the modern National Guard from state militias and codifying the circumstances under which state National Guard units could be federalized. Congress also created both Army and Navy Reserve forces, thereby establishing in the modern era three formal components of the armed services:

- The active force (full-time federal troops);
- The National Guard (state forces that could be mobilized under federal service); and
- Reserves (federal troops that were inactive until mobilized for federal service).

As the armed forces struggled with the transformation from an ancillary security force to the principal instrument of American national power, it also had to undergo a significant intellectual transformation. During the Civil War, for instance, the armed forces had an unprecedented requirement to

conduct major campaigns including joint operations (involving multiple services). A modicum of military education was gained in the Army and Navy military academies as well as the military service schools.

Military theory and doctrine drew heavily from European experience, especially the Napoleonic wars, and influential writers such as Antoine Henri Jomini.<sup>27</sup> Later, the American armed forces were deeply influenced by works such as Alfred Thayer Mahan’s *The Influence of Seapower Upon History*<sup>28</sup> and Carl von Clausewitz’s *On War*<sup>29</sup> that emphasized conventional military operations. American military theory and doctrine were also influenced greatly by combat experience, including experience during the Civil War and World War I, where U.S. forces drew heavily from the British and French military establishments’ understanding of planning, staff work, and other operational skills.

In preparation for and during World War II, the U.S. armed forces developed skills that far exceeded what was needed for hemispheric defense and would serve as the basis for modern thinking about warfare. For example, before the outbreak of World War II, the Naval War College conducted sophisticated war games for global war.<sup>30</sup> Military staffs developed the Rainbow Plans,<sup>31</sup> which dealt with various global contingencies. The Army Air Corps developed concepts for strategic bombing. By the time the U.S. armed forces emerged from World War II, they had the world’s most sophisticated system for the development of professional military education, doctrine, and strategic planning.

In preparing for participation in World War I and World War II, the U.S. also had to scramble to reorganize for new missions that exceeded hemispheric defense. During both wars, for instance, the United States instituted wartime drafts to expand military capabilities. However, the drafts ended when hostilities concluded.

In addition, the services had to develop new capabilities. During World War I, the Army established aviation forces under the Signal Corps. After the war, in 1926, the Army formally established an Army Air Corps.<sup>32</sup> The Navy developed submarine and naval aviation forces. In the interwar years, the Marine Corps developed expeditionary amphibious warfare capabilities (which were also adopted by the U.S. Army during World War II).

During the interwar and wartime years, there also were numerous incidents in which the armed

forces and their leaders became mired in political controversy despite the constitutional strictures that sought to insulate the conduct and oversight of the military from partisan political activity. One of the most noteworthy was the controversial decision to use the Army to eject the Bonus Marchers (World War I veterans who marched on the capital in Washington, D.C., demanding cash redemption of their service bonus certificates).<sup>33</sup>

Even during wartime, the U.S. military often became embroiled in the challenges of social change. Many of the major U.S. military training bases were in the South in states that had instituted “Jim Crow” laws legalizing unequal treatment of African Americans. The presence of mobilized black soldiers resulted in many incidents. Race riots also occurred overseas in Europe and the Pacific. Despite the tensions of segregation, many African Americans volunteered to serve in the military during World War II.

Women also mobilized in significant numbers to serve in the armed forces, though they were organized in reserve corps under the Army, Navy, Marines, and U.S. Coast Guard. Their service was limited by the fact that they were not allowed to perform combat-related duties.

## A Dramatic Transformation

Before World War II, there was vigorous debate over the future of U.S. strategy and how best to protect American interests. This debate was catalyzed by a national organization, the America First Committee, whose leadership included famed aviator Charles A. Lindbergh, the movement’s most recognizable spokesperson. Right up until the U.S. entered World War II, the majority of Americans supported the group’s basic aim: to avoid becoming involved in overseas wars and instead strengthen the nation’s capacity for hemispheric defense.

Days after Pearl Harbor, Lindbergh wrote in his diary: “I can see nothing to do under these circumstances except to fight. If I had been in Congress, I certainly would have voted for a declaration of war.”<sup>34</sup> Many of the America First Committee’s leaders volunteered to serve in the armed forces.<sup>35</sup> Lindbergh managed to find ways to contribute to the war effort, even flying combat missions in the South Pacific.

After the Second World War, America’s place in the world and the requirement for large, standing military forces were open questions. The postwar

world marked a dramatic transformation in the U.S. military that was shaped largely by changing geostrategic conditions and the evolving nature of American power and influence. The concept of hemispheric defense now seemed wholly inadequate. A number of initiatives were undertaken to ensure that U.S. forces had global reach and influence. As the confrontation with the Soviet Union escalated into a Cold War, the armed forces became the primary instrument for the American strategy of containment against the Soviet threat.

The National Security Act of 1947 formalized the roles of the Joint Chiefs of Staff, which had evolved informally over the course of World War II.<sup>36</sup> The law created a National Security Council to improve coordination of the armed forces with the other instruments of national power. An independent Air Force was also established. In addition, authority over the armed forces was consolidated. This eventually led to the Department of Defense, which oversaw the secretaries of the Army, Navy, and Air Force.

The Selective Service Act of 1948 served as the basis for the modern Selective Service System.<sup>37</sup> As global tensions with the Soviet Union rose, a draft was maintained during peace and war (unprecedented in U.S. history) until 1973.

America’s standing armed forces also expanded dramatically. During the course of the nation’s history from its founding to World War II, the U.S. averaged 1 percent to 2 percent of national GDP during peacetime, expanded dramatically during wars, but then was quickly reduced to a one-digit or two-digit norm after the conflict. Throughout the Cold War, however, the U.S. averaged between 7 percent and 8 percent of GDP.<sup>38</sup> Defense spending was also the lion’s share of the federal budget and government research and development (R&D) funding, mostly related to national security, that dwarfed the private sector.

## New Age, New Challenges

The notion that maintaining a small peacetime standing force would be sufficient to ensure that the military would not be exploited as an instrument to undermine democratic rule was clearly no longer relevant in a modern age when large standing armed forces were the norm, not the exception. The notion remained attractive—even desirable—but global realities trumped America’s historical preferences.

The American military establishment grew to such an extent during the first decade of the Cold War that in his farewell address in 1961, President Dwight Eisenhower warned that “[i]n the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex” and “must never let the weight of this combination endanger our liberties or democratic processes.”<sup>39</sup> Nevertheless, the U.S. political structure proved remarkably resilient in sustaining civilian control of the military, a testament not only to the oversight of Congress and the sense of the American people, but also to the professionalism of the military itself and its commitment to constitutional principles.

Political and social tensions affecting the military were endemic throughout the Cold War. In 1949, a number of active and retired senior naval officers became embroiled in a plot to undermine the Administration’s naval policies, an incident that was labeled “the Revolt of the Admirals.”<sup>40</sup> During the Korean War, President Harry Truman ordered the full racial integration of the U.S. military.<sup>41</sup> Truman also sparked a significant confrontation when he fired the senior U.S. commander in the theater, General Douglas MacArthur, for insubordination. In the 1950s, President Eisenhower called out U.S. troops to enforce orders to integrate schools in the South.

The 1960s and 1970s proved even more contentious as the nation was rocked simultaneously by the civil rights and anti-Vietnam War movements. Military forces were frequently called out to quell disturbances. The most shocking incident occurred in 1970 when National Guard soldiers fired on demonstrators at the Kent State University campus, killing four students.<sup>42</sup>

Military culture struggled to adapt to the tumultuous challenges of Cold War politics and social change and unrest. Two of the most influential books of the time were Samuel Huntington’s *The Soldier and the State* (1957)<sup>43</sup> and Morris Janowitz’s *The Professional Soldier* (1960),<sup>44</sup> both of which sought to define the military’s place in modern American society and reconcile the struggles in contemporary civilian–military relations. But while both were deeply influential and widely read in the military, their prescription to define a professional space insulated from political turmoil, the rapidly changing modern world, and the rapid shifts in demands of and attitudes toward the military largely proved fruitless and inadequate.

For much of American history, absent major wars, the American military was comprised of people and institutions that had scant interaction with most Americans. The military drew limited public resources. Sailors were far away at sea, and soldiers were stationed on dusty bases in Texas or far-off garrisons in China, removed from everyday life.

From World War II (when more than 10 percent of American men were in uniform) on, the armed forces and veterans were a ubiquitous part of American life. Moreover, social change intertwined America and its armed forces. In 1978, the women’s reserve corps were disbanded, and women were integrated into the regular services (though still excluded from combat roles). Women were also accepted at the nation’s military academies. Change also brought new challenges. In the coming decades, for instance, all of the services would face major scandals involving the treatment of women in the military and be dogged by allegations of sexual abuse and violence in the armed forces.

### Guns vs. Butter and More

Another significant change in the military’s place in American life was the armed forces’ impact on fiscal policy. From the American Revolution through the first half of the 20th century, when military forces were modest, defense spending might engender occasional heated controversies and debates but was not a significant factor in the American political economy. That completely changed after World War II. Although the military after the war remained—and remains to this day—a global force that required significant funding, the size of the military and its related funding were continually whipsawed, buffeted by politics, the state of the U.S. economy, and global affairs. For example:

- With the conclusion of the Second World War, President Harry Truman (1945–1952) consciously sought to reduce the armed forces, only to reverse course with the outbreak of the Korean War.
- President Dwight Eisenhower (1953–1961) also instituted significant reductions in conventional forces, which he offset in part by increased funding for nuclear arms, a policy that was continued by President John Kennedy (1961–1963).<sup>45</sup>

- President Lyndon Johnson (1963–1969) dramatically increased defense spending to accommodate the war in Vietnam, but he also increased domestic spending, which resulted in a significant negative impact on the economy.

Presidents continued to look for military reductions until President Ronald Reagan (1981–1989) dramatically increased the size of the military, justifying it as necessary to outmatch the Soviet military. Following the end of the Cold War, the military experienced a cascading series of force reductions that continued until the terrorist attacks of September 11, 2001, and the outbreak of war in Afghanistan and Iraq. President Barack Obama (2009–2017) again sought force and spending reductions, only to see that trend reversed by President Donald Trump (2016–2017), who sought to increase readiness; focus on countering China, Russia, and Iran; and establish a new military service—the United States Space Force.

Much of the push and pull in the size, scope, and funding of military forces was the result of more than fiscal pressures, changing geopolitics, and views of how to employ modern militaries. In the wake of the Vietnam War, for instance, the U.S. military came in for scathing criticism. One influential critique, historian Russell Weigley’s *The American Way of War* (1973),<sup>46</sup> argued that American military tradition was overly focused and dependent on the use of brute force in war. Another well-known critique, Harry G. Summers’ *On Strategy* (1982),<sup>47</sup> concluded that the problem was how modern militaries are employed.

The Goldwater–Nichols Act of 1986,<sup>48</sup> the first sweeping legislative reform since the National Security Act of 1947, was authored to address the inefficiencies and inadequacies of the military in modern warfare. Among the initiatives in the law were measures to improve the conduct of joint operations by improving the ability of the individual services not just to work together, but to develop synergies more intentionally by leveraging each other in an integrated way.

Technology also introduced dramatic changes. The proliferation of silicon microchips engendered a new generation of computer technologies that had an immediate impact on the military. GPS, for instance, enabled the widespread deployment of precision-guided weapons. Technological evolution

also affected (and continues to affect) how the military conceptualizes operations. In addition to being joint, forces must also be multidimensional, integrating operations on land, at sea and below the surface, in the air, in space, and in cyberspace.

The U.S. military has also been asked to conduct a wide variety of operations, from conventional warfare to occupation duties, border security, and homeland defense, and to assume an expanding role in space operations. On top of this, while the U.S. armed forces have always been tasked with global missions since World War II, the rise of China, a resurgent Russian threat, and persistent aggression from Iran in the Middle East have led to a lively debate over how to apportion forces and efforts—an especially difficult challenge given the reduction in forces following the end of the Cold War.

In addition, manpower issues have increasingly come to shape the nature of the force. Before the end of the Cold War, reserve components (Army, Navy, Air Force, Marines, and Coast Guard) and National Guard (Army and Air Force) were used predominantly only in wartime. Since the end of the Cold War, the armed forces routinely call on all components of the “total force.”

Further, the U.S. military has not employed Selective Service since the 1970s. Instead, the military relies on recruiting and retaining an all-volunteer force. The challenges of sustaining such a force are changing with the demographics of the country, particularly since there is decreasing propensity to serve in the military and fewer American youth are qualified for military service.<sup>49</sup> Though all military positions have been open to both men and women, the challenge continues to grow.

Another contemporary challenge is the size of the veteran population, which is on a scale not seen since Vietnam. Veterans who have a range of physical and mental health challenges, as well as valuable skills to bring to civilian communities, also have political influence. Historically, large veteran populations after the Civil War, World Wars I and II, and Vietnam have had an economic, political, and social impact on the country in addition to affecting how we provide services and support for future servicemembers. The 9/11 generation most likely will as well.

While the armed forces were buffeted in the post–Cold War world by shifts in focus, demands, funding, and the advent of technologies that affect



military operations, they were also affected by dramatic social change. President Bill Clinton (1993–2001) generated controversy when he attempted to change policies to allow homosexuals to serve openly in the armed forces. Opposition was substantial and led to a compromise policy known as “don’t ask, don’t tell.” Under President Obama, gays and lesbians were permitted to serve openly in the military, and restrictions prohibiting “gay marriage” were removed.<sup>50</sup>

These shifts have introduced a dramatic cascade of social policy changes that now includes controversy over transsexuals serving in the U.S. military. Further, initiatives like Diversity, Equity, and Inclusion (DEI) and Environmental and Social Governance (ESG) programs have embroiled the armed services in controversial debates over social policies and cultural norms. Proponents of such changes argue that increased diversity within the force will somehow make it stronger, more effective, and more resilient while also aligning it with the demographic profile of American society, but there is no clear evidence that supports these claims. To the contrary, such politically progressive policies appear to hurt recruiting and retention efforts and have spurred strong opposition within the military and among the retired and veteran communities.

## Looking to the Future

The history of America’s military demonstrates the resilience of democratic structures. Yet it is also clear that the constitutional order governing the military’s relationship with the federal government and the American people is not immune from political pressure and destructive influence. The healthy state of civil–military relations can never be taken for granted; nor should the need to check influences and impulses that seek to make military forces a tool of political factions.

U.S. history shows that the roles, missions, structure, and capabilities of America’s military forces are regularly subject to change. As the needs of providing for the common defense continue to evolve, so must the armed forces. Consequently, the why, how, and extent of change should be a subject of serious, sober debate. America will remain a global power and will continue to need a military that is up to the task of protecting the homeland and the country’s interests on a global scale. The struggles the nation has faced since the end of World War II and the forces that impact them—geopolitics, the economy, technology, and social change—are not going away. The choices that have to be made in the future will be no easier than the choices that had to be made in the past. Nor will the magnitude of the consequences of getting it right or wrong be any less.

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# The Military and Society: A Refresher

Anna Simons, PhD

What does it mean when the Vice President of the United States tells cadets in a historic speech at West Point that our military is “strongest when it fully reflects the people of America”?<sup>1</sup> Should 42 percent of those in uniform be obese or more than 13 percent be taking antidepressants?<sup>2</sup> Alternatively, maybe this means 50.5 percent of the force should be female, while American Indians would need to be dismissed because, at a little over 1 percent of the population, they serve in disproportionate numbers.<sup>3</sup>

Even if we concede that the Vice President was really only alluding to what she could see as she gazed out at the Long Gray Line, the point of a modern professional military is not to *reflect* the society from which it is drawn. Instead, we have a military to *protect* that society—all of us, along with our borders *and* our freedom on the seas, in the air, and across the global commons.

Ironically, if we had compulsory national service with a military option, all sorts of representational goals could have been achieved by now. Imagine, too, for a moment the more serious issues universal service would also address. Would it help restore civic identity? Yes. Tighten the links between civic responsibilities and civic rights? Yes. Get youth to invest sweat equity in their own country? Yes again.

But the U.S. has never had national service, and conscription hasn't been practiced in 50 years.<sup>4</sup> Few on the political Left or Right are even asking that women sign up for Selective Service. Instead, we have had an All-Volunteer Force since 1973, which has left it up to the services to try to attract the recruits that they need. “All-Volunteer” should raise two questions for “we the people”:

- Whom *do* the services need?
- How might we assist since we are the military's ultimate beneficiaries?

To do justice to these two questions requires digging deeper than simply painting the military as too woke or not woke enough. Instead, we had better understand what makes the military's job unique, which in turn means reviewing the U.S.'s security requirements and appreciating what makes *them* unique.

By point of quick comparison, consider Ukraine—whose continued independence depends on us and our NATO partners. Or consider any one of those NATO partners. If the U.S. got into serious military trouble, which among them could rescue us? The answer is: none.

No ally or coalition of allies comes close to matching the U.S. in productivity, scale, or resource base. None has the logistical or expeditionary reach to render us meaningful immediate assistance. It is doubtful that any could gear up to offer sufficient eventual assistance, let alone resupply us effectively. We are too distant. We are also too militarily essential to *them*. Thus, we have only ourselves to rely on.

*That* makes us unique.

Add to this the fact that we are not neutral Switzerland or Lichtenstein. We are more like a Gulliver or a Goliath. We have been a force at large in the world since at least the 1890s (with our acquisition of the Philippines, Puerto Rico, Guam, and temporarily Cuba). We are rich, commercially assertive, and like to promote democracy and capitalism abroad, all of which makes us a target. Indeed, we have more different kinds of adversaries right now than at any point in our history.

These range from peoples whose homelands we have helped upend to leaders whose regimes we have said should go.

Revenge is a multigenerational elixir, but *schadenfreude* can be equally motivating. Consequently, our primacy will continue to invite one-upmanship from aspiring powers. But plenty of lesser powers wouldn't mind seeing us taken down a notch or two either. Thus, for all of the legitimate concern about Russia, China, Iran, and North Korea, what about Cuba and Syria—or jihadis and other violent sub-state actors? And shouldn't we also worry about climate-first environmentalists, especially as warnings of our impending ecological demise grow louder?

Coincident with the widening array of people gunning for us are the proliferating means at their disposal, from hypersonic missiles to balloon-borne electromagnetic pulses (EMPs) to weaponized viruses and beyond. Then there are our excessively porous borders, not to mention the 11,000,000 shipping containers offloaded into U.S. ports annually.<sup>5</sup> Or what about the millions of American passport holders who reside abroad.<sup>6</sup> Will they become future political hostages like Brittney Griner and Evan Gershkovich? Despite extensive hardening, our embassies can't even protect themselves effectively. If only they could, Washington wouldn't have to evacuate them as often as it does, most recently in Khartoum, Kyiv, and Kabul.<sup>7</sup>

In other words, protecting the U.S. and American interests is not just costly; it is extremely difficult, especially when you factor in how much of our daily business—and daily lives—we conduct online. We Americans have made ourselves dependent on networks and systems that can't be secured, to include the grids that power them. At the same time, we have opened ourselves up to methods of subversion that we can't always detect. And when we do finally forensically figure out what has occurred and the source is a unit in the People's Liberation Army or a cutout associated with the Kremlin, we do remarkably little (and often nothing) to prevent a recurrence.

Because the 21st century aim of subversion won't be to swallow us whole, but rather to weaken and sideline us, it won't matter to our adversaries how our domestic animosities play out. The only thing opponents need to ensure is that our mutual distrust continues to fester and intensify. COVID

is the great shining example of how easy this can be. Public health responses to COVID, from the federal level down to local government and even school district levels, created so much chaos that it is doubtful public health officials will ever fully regain the public's trust. COVID's novelty, rapid spread, and virulence contributed to the chaos, but so did the absence of anyone in authority who could rise above the fray as the voice of consistent, calm reason.

Collective national security will similarly unravel without a credible overarching source of information to which all (or even most) Americans will accede in a crisis. I have long contended that this constitutes our greatest national security risk because, as Abraham Lincoln reminded Americans, "a house divided against itself cannot stand."<sup>8</sup> However, post-COVID, I would modify my contention: We don't just need a credible overarching source of information. We need credible explanations too. Officials have to be able to explain in plain unvarnished language how they are connecting policy dots and why the decisions they make are in "we the people's" security interests. Nor can their explanations consist of spin or soporifics. We need to hear adult explanations that are balanced, truthful, and free of political spin.

It seems telling that even before COVID, a growing number of Americans prepped—as in prepared for disaster—while ultra-wealthy tech moguls invested eye-popping sums of money to build themselves remote, fortified bunkers rather than lobby for community-wide or national civil defense. The prepper subtext was (and is) that government can't be counted on, society will fall apart, and we will all be left apocalyptically scrabbling for ourselves. Whatever the source of these convictions—classic American paranoia, prescience, or both—preppers' lack of faith in their fellow Americans and their desire to look out only for select family members and themselves speak volumes.

Lack of collective faith or confidence tracks with what military recruiters report when they try to account for recruitment challenges. One of the factors they cite is waning patriotism even in Red States with significant rural populations.<sup>9</sup> This accords with Jean Twenge's observations in *Generations: The Real Differences Between Gen Z, Millennials, Gen X, Boomers, and Silents—and What They Mean for America's Future*:

In a July 2021 poll, only 36% of 18- to 24-year-olds (all Gen Z) said they were “very” or “extremely” proud to be an American. In contrast, 86% of those 65 or older (Boomers and Silents) said they were proud to be American. John Della Volpe, the director of polling at the Harvard Kennedy School of Government, spoke to hundreds of young people for his 2022 book, *Fight: How Gen Z Is Channeling Their Fear and Passion to Save America*. When asked to describe the U.S., he found, young Americans in the mid-2010s used words like “diverse,” “free,” and “land of abundance.” A few years later, Gen Z’ers instead said “dystopic,” “broken,” and “a bloody mess.” When he asked Gen Z’ers about moments that made them proud to be Americans, “I got blank stares, or examples of random sporting events like the USA soccer team finally beating Ghana in a 2017 friendly match,” he writes.<sup>10</sup>

Again, however, as the prepper phenomenon suggests, it isn’t just youth who feel disaffected.

From a security standpoint, these disconnects—first within society, then between society and the military—aren’t just concerning: They’re imperiling. The U.S. government spends more money per capita on security than does any other major power. Yet Americans’ anxieties are not allayed. Why not? Why can’t senior military leaders reassure the public that our military *can* protect us? Or, if the military can’t protect us, why can’t military leaders level with Congress to explain what *is* required?

### **Violence, Combat, and the Military’s Raison d’être**

Although chivalry might be considered an outmoded concept, that is ultimately what we civilians expect from our military. We count on servicemen and women to safeguard us and our property, much as other first responders do—except for the added responsibilities related to the use of force that set the military apart.

The military’s overriding purpose is to prepare and stay prepared to wield force. Maybe adversaries can be deterred without the use of actual violence, but deterrence requires that others know you both can and will use punishing force, which is why readiness needs to be maintained around the clock and why combat skills across all domains matter. What

these skills consist of must necessarily vary by type of unit, but at base, physical fighting strength still matters and will always matter. This will hold even if (or when) it becomes possible to wage war exclusively through bytes and bots, since whoever is responsible for pushing the proverbial button will need to be physically protected, as will the entire digital architecture (or, at the very least, the one wire or device that tethers the technology to us).

There is a second reason why dagger-between-the-teeth/crawl-across-the-scorched-earth combat capabilities remain essential: Violence is the one form of human communication that requires no cross-cultural translation. Violence is *viscerally* compelling. It is also incomparably effective. The U.S. and NATO’s preferred means of innovation might be technological, but just because the U.S. and NATO strive for precision and try to adhere to just war principles<sup>11</sup> does not mean that others do as well. Others, with different values and/or resource constraints, innovate quite differently. They innovate in terms of what they can do with and to other human beings—from using widows as suicide bombers to purposely orphaning children in order to turn them into child soldiers.

Nor is it as though old practices ever entirely disappear. Since the turn of the 21st century, we’ve seen piracy revived, villages gassed, hostages beheaded, and dams deliberately breached. Or what about rape and famine? Humans have proven both that there is no limit to the unconscionable things they will do *to* one another unless they are stopped and that the only way to stop them is through an equally unsparing but more targeted and overwhelming use of force.

### **Attrition**

Wielding force is dangerous. So is training to wield force, never mind training to use force precisely and judiciously. Consequently, attrition is an enduring military problem. It is worth remembering that while illness, injury, and death are ever-present dangers during wartime, attrition occurs during peacetime too. Accidents happen during training and off-duty hours alike—all of which makes *interchangeability* a military necessity. What do I mean by *interchangeability*? The ability of one person to fill in for another quickly.

The need for interchangeability rarely receives the attention it deserves, but it is especially

germane in ground combat units, which need to be robust enough to accomplish their mission while still remaining small enough to function as an independent cohesive whole. Since no one can operate a .50 caliber machine gun *and* perform a battlefield intubation *and* operate a radio all at the same time, all squads, platoons, and teams have a fixed (as in clear, preestablished) division of labor. Soldiers and Marines specialize only once they are interchangeably proficient at critical “shoot, move, and communicate” skills. The unit can’t survive unless everyone is equally physically capable of essential combat tasks. Attrition necessitates mutual, interchangeable reliability.

However, interchangeability doesn’t just require that everyone be physically, mentally, and emotionally reliable. It also demands trust among those in the unit. Individuals have to be confident that those on their left and right, as well as those leading them, are proficient. This helps to explain the importance of standards. *Can A carry B away from danger? Can C shoot as accurately as D and E?* So long as standards remain as stringent as worst-case scenarios demand, they reassure all members that everyone in the unit *can* perform in expected ways. Thanks to standards, units are likewise able to absorb new members without undue disruption in the face of loss. Grim as this is to contemplate, nothing is more essential to ultimate success.

Being able to trust others reflexively is key for two reasons.

- When *in extremis*, no unit can afford to have members who have to second-guess one another because they see the world differently or prioritize differently. Instead, everyone has to be sure that they share a common mindset and will respond as expected, *especially* when everything falls apart.
- It is not enough just to know that others can haul, heave, climb, swim, and/or otherwise cover distance under heavy loads. Can they also keep their heads under pressure? This is no less vital.

In other words, similarity isn’t a problem; divergence is. Divergence shreds dependability, which is why the criteria that matter are ability, attitude, and allegiance. They matter most because they matter

to performance. Everything else that outsiders think they should be able to see, because they want to *see* diversity, is immaterial to what prevailing in combat requires.

### Connecting the Dots

The contradictions between military necessity and societal desires, along with civilians’ expectations *of* the military, should be self-evident. In the same ways that countries aren’t equally interchangeable—no one is going to rescue the U.S. in a crisis; only we Americans can do that—people are not built or wired the same. Nor can they be made to be interchangeable. Some will always be better at some things than others are. But this does not mean that the military overall should not be more diverse than it is—in unit roles and responsibilities and in its division of labor.

Politicians and general officers love to proclaim that “our military is the strongest in the world.” But simply saying so is not enough. Adversaries need both to fear us *and* to know we mean what we say. They need to count on our responding *regardless* of the means they use to inflict harm. Otherwise, we (and our allies) remain ripe for subversion, cyberattacks, EMPs, and other not exactly direct but nonetheless devastating body blows—a la COVID—which is why the one form of diversity the military *should* herald is the myriad ways in which it can strike back. This is the only display that matters to our adversaries. In fact, the more attention the services pay to skin tones and pronouns, the easier we make it for adversaries to use our differences *over* these differences against us.

Because the military will always need more combat power than ground forces alone can supply, one size cannot and should not fit all. The Air Force can’t be the Navy, and the Navy is not the Marine Corps. Special Operations Forces might need a preponderance of Type A personalities, but too many Type As in tight quarters on a submarine would likely be a disaster. The only rule of thumb should be the attrition/interchangeability rule of thumb: Every effort should always be made to bolster reflexive trust, and changes that would undermine that trust should never be introduced. For instance, Space Guardians whose careers will be spent indoors should no more need to meet Airborne physical fitness standards than members of the 82nd Airborne Division should have to learn how



to repair satellite antennae in space. Nor should we want different units or branches to approach problem-solving similarly.

In fact, the military will fail if it has too much sameness across the board. Basically, diversity is militarily vital when it comes to varied capabilities across the total force; trying to manufacture it within units, on the other hand, jeopardizes the capabilities-based integrity that those *in* the unit need to know their unit has.

Given the need for a wide array of skill sets and aptitudes, the gazillion-dollar question then becomes: Which essentials do all members of the military need to share, and which should be unit-specific and specialty-specific? On the face of it, this might appear to be an easy question to answer. For instance, everyone in uniform should be emotionally stable, willing to work, and loyal to the U.S. They should also have an affinity for teamwork and a respect for hierarchy. Right now, however, the services can't be sure how deep-rooted any such sentiments are.

Of course, young people's attitudes are not their responsibility alone, but they do create challenges. Take hierarchy. The idea that someone deserves unearned deference just because they are older is an increasingly antiquated notion. Also, compared to previous generations, fewer young people today have been raised *having* to obey authority, yet the military remains a gerontocratic (age-based and experience-based) hierarchical institution. Rank is supposed to—*nay, has to*—cue obedience. Without obedience, chains of command can't function, and command, control, and coordination become impossible.

Since age has been integral to every society's division of labor from time immemorial, it isn't surprising that gerontocracy became the military's foundational organizing principle. To this day, it provides several advantages. For one, seniority makes throughput, as well as up-and-out, easy and does so by promising a fair shake to everyone. In addition, experience really does matter. There is a learning curve to being able to handle large numbers of people and complex situations adroitly. Rank, which is meant to serve as a proxy for ability and experience (and not just age), is integral to authority, while the only way for discipline to be internalized and transmuted into *self*-discipline is by compelling young people to do things they

otherwise wouldn't want to do or don't think they can do. Authority enables this.

At the same time that the military has its needs—hierarchy and obedience—young people have built-in propensities too. For instance, young people are classically impatient. They especially dislike hypocrisy and unfairness. Yet for tens of thousands of years, youth have more or less been locked in, forced to wait their turn because those senior to them have controlled the levers of power and the keys to success. This helps to explain why all of us who are now chronologically “senior” deferred to our seniors once upon a time when we were young adults: Back then, we had no choice.

Recently, however, the tables turned.

### Societal Sea Changes

For the first time in human history, adults today willingly and even routinely defer to youth. Not only do adults turn to their children (and younger employees) for tech help and advice, but as the term “peerent” implies, it seems that parents would rather be their kids' friends than their disciplinarians. Nor is this the only sociological shift underway that has profound implications for the military.

For instance, the idea of *a* career no longer rates the way it once did. In the business world, switching jobs or even quitting a career midstream is no longer stigmatized. In fact, no one seems to be expected to stick with anything if they don't want to; nor does follow-through rate as significantly as it once did. Even the relatively recent concept of “work–life balance” is being further tilted away from work so that enjoying life, with breaks for fun, increasingly takes precedence.

Well before the appearance of COVID, employers, teachers, coaches, and others who worked with young people were already voicing concern (or bewilderment) about underdeveloped work habits and social skills. The pandemic is blamed for having intensified these deficiencies, though again, young people can't be held accountable for how they were (or were not) raised. Instead, when society at large lacks clear standards, *it*—meaning we—bears responsibility for what we castigate as young people's lack of direction, confidence, reliability, grit, and so on.

At the same time, just a cursory look at the literature about generational differences makes it clear that previous generations not only *felt* more rooted,

but were collectively grounded. By this I mean that up through the mid-1990s, most young Americans were taught (or at least exposed to) similar things regardless of how or where they grew up, whether in rural or urban settings, in intact or single-parent households, and irrespective of ethnic or religious background. Schools transmitted canonical versions of American history and literature, and kids grew up sharing a common popular culture too. In contrast, from entertainment through education, everything has become more dissolute. Just consider the proliferation in private schools, parochial schools, charter schools, and home schools—never mind the variation this leads to across curricula.

To complicate matters even more, it is hard to think of any hobby, sport, or other activity that hasn't been made more difficult, competitive, or costly to access—with sports camps for elementary-aged children, as many different types of bicycle as there are surfaces, skateboards that cost between \$40 and \$200.<sup>12</sup> Even science can't be done with just a pencil, paper, and powers of observation anymore.

One impact of so much complexity and diffuseness is that what young people know (or don't know), what they know how to do (or not), what they have already been exposed to (or not), what they are capable of (or not), what they do or don't believe, what they expect from life, from adulthood, from one another, and so on are so widely divergent that the military can no longer count on any shared foundational understanding with regard to anything. This uneven preparation raises two urgent questions:

- Without a common base, what can the military use to instill commitment to a common purpose, which is so essential to mutual reliability, or cohesion, teamwork, and effectiveness?
- From what can, or should, it fashion a common, red-white-and-blue identity?

Here is where, counterintuitively, today's dissimilitude is not necessarily wholly negative. It may even represent an opportunity. After all, militaries have always needed to do some remediation. Could the U.S. military now help to re-even the playing field for recruits and future officers at accession? Could it use innovative teaching and training techniques not only to build a broader, firmer, shared

foundation, but in such a way as to help young Americans better sort and bin themselves?

Tellingly, the military's most elite units usually do a better job of screening for who they think they need than even private industry's most exclusive firms do. They do so partly by recognizing that there is no more effective way to encourage people to select themselves out than to expose candidates to what will be expected of them on the job. In addition to being the fairest, most meritocratic, and most equitable approach to determining who does and doesn't belong where, assessment and selection via exposure grants individuals equal agency: Everyone can strive to do their best, or not.

While cost might be one objection to combining civic and education repair with granting young people the opportunity to mature their sense of themselves, the rejoinder is: What is the alternative? Not only do society's lapses need to be remediated somehow, but if the military doesn't do so at the outset of everyone's service, it can't short-circuit the mis-"fit" costs incurred when individuals end up where they don't belong—to include doing things they shouldn't, which is a growing problem.

In fact, talk to colonels in command of brigade-sized units today, and it is stunning to hear how much time they spend having to respond to and manage abuse allegations, domestic violence cases, drug problems, thefts, suicides, murder-suicides, and a range of other behavioral breakdowns—few of which are caused by military service. But because these problems manifest themselves while individuals are in uniform, they demand a military response. Among the significant collateral costs is time taken away from being able to check on training or get to know, let alone be able to mentor, promising young leaders. Even worse, this is driving out officers and senior non-commissioned officers who spent the past 20-plus years deploying back and forth to combat zones in Afghanistan and the Middle East and are choosing to retire rather than accept promotion because, as they put it, they do not want to be and have not been trained to be social workers.

A second potential objection to the military stepping into the breach to make up for society's shortfalls (especially since teaching anything has become so politically charged) is: What would the military teach? Of course, the military has long been in the teaching business; it has always taught skills.

But, little realized by the public, the military also provides more continuing education than any other employer in the country, especially to officers. As for relevant educational subjects, there should be nothing controversial about suggesting civics. For instance, what roles and responsibilities does the Constitution enumerate—especially since service-members swear an oath to support and defend the Constitution? What about roles and responsibilities *in* the military, between the military and other government agencies, between civilian and military leaders, or between the U.S. and other countries, and so on?

Or what about history, geography, and enough STEM<sup>13</sup> awareness to foster an appreciation for *how* things work, all of which could be woven into field training and other exercises? These topics matter because despite young people’s facility with bits and bytes, knowledge and understanding cannot be acquired just by clicking through hyperlinks. They require content and context. Unfortunately, we have permitted (or even encouraged) too many young people to be overly dismissive of both, which is imperiling. Take history. Without a firm grounding in the chronology of events—*chronology*, which is the totally apolitical unreeling of time; *events*, one damned thing after another—it is impossible to contextualize the present accurately, never mind the past. It also becomes too easy to fall prey to whatever story *sounds* best, regardless of how inaccurate it is, especially since corroborating “proof” floats free (and frequently fact-free) online.

To the military’s credit, critical thinking and analytical methods have come to be considered key components of professional military education. Even in my former department (defense analysis), our tagline was that we didn’t teach students *what*, but *how to think*. However, methods do people little good if they don’t possess a fundament of knowledge first. Worse, applying critical thinking skills can make people sound smarter than they are. Or perhaps a more diplomatic way to put this is that smart questions can make the asker sound impressive, but when it comes to answers, can he or she distinguish which are most accurate? Or what about discerning who’s an expert?

Expertise introduces a particularly pressing challenge for today’s military since it isn’t possible for even the most senior leaders to be expert about Islamists *and* China, or Iran *and* North Korea, just

as it isn’t possible to be knowledgeable about underwater acoustics *and* aeronautics. If we look ahead, what will happen when generalist senior leaders have to be able to determine who is or isn’t worth listening (or turning) to for advice and credible information in areas or regions about which they know little? Afghanistan and Iraq offer just a foretaste. With “fake it till you make it” salesmanship increasingly suffusing academe, research institutions, and think tanks, and not just broader society, senior leaders will be in even greater trouble.

This is why it is important to underscore that the only way to prevent relentless self-promotion from occluding real expertise is to recommit to high standards, facts-based analysis, and appreciation for performance-based merit. Or, as in combat, so in military preparation and preparation *of* the military. This must all be of a piece.

### Not Like Any Other Institution

Although the military will always be buffeted by whatever is trending in society, the services have a much greater ability to resist contorting themselves to keep up than they seem to realize. The military also has more going for it than it seems to realize—provided its leaders remind legislators, civilian leaders, and the public that its overriding *raison d’être* is to protect us.

The military, we must remember, is not like any other institution or calling. Nor should it try to be. Instead, it can and should make more (much more) of opportunities that are available only to those who serve. Here I don’t just refer to a steady paycheck and benefits, but also to purpose, belonging, identity, service, and getting to see the world—which have long been the classic standbys, along with the prospect of combat for those who sign up for the combat arms. Other standbys include structure, job security, and the prospect of a career, all of which are fast disappearing from civilian life.<sup>14</sup>

Thus, no matter how *passé* it might seem right now for someone to want to stay committed to *a* line of work, never mind *an* enterprise over the course of 20 or 30 years, this kind of security is bound to prove increasingly attractive as artificial intelligence (AI), market churn, and global volatility wipe out everyone else’s first, second, and third attempts to forge a meaningful life. Moreover, that the military has always built so many jobs into a single career means that service is comprised of

variety and, even better, servicemembers get to do new things without having to figure out next steps on their own.

Even more immediately attractive, especially for those who are young, who don't yet have families, and who want to try new things, is getting to do things civilians don't get to do, whether with real weapons, cyberweapons, in planes, out of planes, from ships, under water, in space, etc.—or, to return to what sets the military apart, the prospect of daring and danger. Daring means being prepared to do what others can't in the face of danger, whether this is heading toward it, rescuing others from it, or fomenting it for adversaries.

As dated as it sounds, what defense requires in any guise is chivalry—the protection of civilians—and daring. Combat just happens to require both to an acute degree.

I mention combat again because it is critical to remember why we have a military—we have adversaries. Adversaries are why we need the military to excel at combat, which is the only thing that stands between us and harm. I mean this literally, because ultimately protection boils down to the *literal* saving, sparing, or taking of life.

While the primary reason we have a military is to prevail in combat, the corollary reason we have a military is to deter bad actors from threatening America. Since the advent of nuclear weapons, *detering* conflict has struck most Americans as exceedingly important. Given the range of adversaries and life-altering threats we face today, deterrence is more important than ever. This alone should make us exceedingly mindful of what represents both the first line of deterrence and the last line of defense: namely, the integrity of the military itself.

Consequently, for self-protective reasons alone, we Americans should do what we can to prevent the

services from adopting policies that alienate young people who want to volunteer but who increasingly hesitate because they fear that political agendas are taking precedence over the tough but meritocratic standards that enable them to trust authority and one another. If the services don't stand for—or stand up for—retaining rigor, it is hard to imagine what will then serve to hold the military together, especially in light of unrelenting partisan pressures or if the country should experience more partisan violence than it has thus far.

The military's most obvious source of strength is that it *doesn't* reflect society. It can't. It *has* to remain different to protect the rest of us.

## Conclusion

One final observation: The officers I taught attributed bad policies, misguided decisions, and inane bureaucracy to leadership issues so often in class that I would inwardly roll my eyes: How could everything be a “leadership issue?!” But after more than two decades of watching everything they have had to contend with, I have come around to their point of view.

Leaders *are* the issue. By this I mean that if generals and admirals with three and four stars on their shoulders can't make clear how much of our future rides on combat and combat-support capabilities and what these need to consist of (as well as what they can't consist of, despite intensive lobbying done on behalf of unnecessary technology, platforms, and social reengineering), then they will be cheating young Americans out of the better future all leaders promise. Worse, if senior military leaders persist in being unwilling to speak truth to power—or speak truth *in* Washington—they will further diminish the value of the rank they wear, and that will be bad for all of us, civilian and military.

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# The U.S. Defense Industrial Base: Past Strength, Current Challenges, and Needed Change

Maiya Clark

The United States faces threats from its rivals and from rogue actors, and it maintains a military of land, sea, air, and space forces to counter those threats. This *Index of U.S. Military Strength* provides analysis of those military forces' adequacy. The military, however, is only the most visible element of national defense; beneath the surface, a much larger industrial capacity serves to undergird that military power.

This industrial capacity—the defense industrial base—consists of the government-owned and privately owned factories, foundries, shipyards, and ammunition plants that produce defense end items. It also includes the businesses and government institutions that produce those items, from prime contractors with hundreds of thousands of employees and billions of dollars in annual revenue down to small businesses that make individual components for larger defense systems and innovators that create new technologies, whether startups with defense-relevant emerging tech or academia and research universities. The defense industrial base also includes the workforce that powers this sector.

In the past, U.S. industrial might as a whole underwrote U.S. military strength and success. Manufacturing underpinned the national economy. When urgent national security threats emerged, leaders prioritized defense investments, and private industry and government facilities responded to this demand signal—accomplishing incredible feats like producing nearly 300,000 aircraft and 86,000 tanks in World War II.<sup>1</sup> Industry could respond because latent production capacity already existed, either for defense-specific items or for commercial items that could be converted to defense production.

Government capabilities existed as a result of previous wartime mobilizations.

Today, America's national defense remains just as dependent on the nature of its economy; those ties, however, do not make the U.S. as secure as they once did. The U.S. economy is now based primarily in knowledge and services: Manufacturing accounted for only 8.7 percent of U.S. jobs in 2015, compared to 32 percent in 1953.<sup>2</sup>

Despite the current deficiencies in the defense industrial base, leaders in Congress and the executive branch have not yet chosen either to increase federal funding for defense or to make the difficult trade-offs (such as cutting entitlement spending) that would be necessary under such an increase to enable a restoration of this key capability.

The global threat environment is growing more hostile as the economic and cultural factors that historically have supported U.S. military strength decline. Not only have manufacturing and key industrial processes moved overseas, but—even worse—they have moved to China, America's chief rival. The U.S. is in a “new Cold War” with China even as the two countries' economies are deeply intertwined.

U.S. military strength therefore cannot rely on the economic conditions and assumptions of the past—those conditions no longer exist, and any attempt to recreate them would require heavy government intervention in the economy with all of the inefficiencies and injustices that such intervention entails. Rather, leaders must pursue the development of a strong U.S. military and resilient defense industrial base within today's economic environment, utilizing innovative policies to ensure that

defense production can meet America's demands in today's changing security environment.

### History of U.S. Defense Production

The U.S. has produced defense items since before the American Revolution. Though this could hardly be called an "industrial base," as it predates industrialization, the U.S. produced weapons and built ships for the Revolutionary War and the War of 1812. The earliest defense industries in the U.S. based their businesses around arming the combatants of imperial wars in Europe.<sup>3</sup> Then, during the American Civil War, the North's superior defense production capacity contributed in a major way to its eventual victory.<sup>4</sup>

The U.S. produced weapons that were eventually used in World War I, but because it lacked defense-specific production capacity, by the time its industry was able to produce items like tanks and artillery pieces, the war was nearly over. For example, although poison gas was first used in the war in 1915, when the U.S. joined the fight in 1917, the Army could still not produce its own gas masks and instead had to borrow respirator equipment from British and French forces.<sup>5</sup>

The first real test of U.S. defense industrial capacity was World War II. In the years before the war, the U.S. had developed a great deal of manufacturing capacity, as well as latent capacity, as a result of policies that were designed to mitigate the Great Depression. The U.S. also had a large workforce and plentiful available labor for the same reason. While this industrial capacity was not being used for defense production at the time, political and business leaders saw that the war unfolding in Europe in 1939 and 1940 would require much more participation from the United States. Leaders in the auto industry in particular saw that their manufacturing capacity would need to be mobilized for wartime production. Both allies and the U.S. government sharply increased their purchases of defense goods, from aircraft to uniforms. Industry responded to this surge in demand for defense goods by converting their commercial manufacturing capacity for items like washing machines and record players to the production of war matériel.<sup>6</sup>

The relatively unsophisticated nature of the matériel being produced meant that manufacturing capacity for consumer goods could shift to war production fairly easily. Military Jeeps were just trucks,

and bombs were merely steel and explosives. Even more complex end items like planes were made of components that could be produced in commercial factories: For example, Frigidaire, an electric refrigerator manufacturer, produced propellers, hydraulic aircraft controls, and machine guns for combat aircraft.<sup>7</sup>

The combination of factors that allowed the U.S. to mobilize successfully for World War II would continue to define U.S. defense industrial capacity for most of the rest of the 20th century. A large domestic industrial capacity in general, and a large defense industrial base in particular, combined with the will of political and business leaders and a commitment to spending and contracts for defense to produce an Allied victory.

The same framework held true for much of the Cold War: The U.S. continued to be a manufacturing powerhouse through much of the 20th century, and the U.S. defense industry consistently outmatched that of the Soviet Union for technological supremacy. Leaders also recognized the importance of defense during this time because the threat of the Cold War becoming a hot war with the Soviet Union was often foremost in the American consciousness (schoolchildren practiced sheltering under their desks in the event of nuclear attack, for example). There was a clear adversary against whom the United States had to arm itself.

Leaders also spent significant amounts of federal funds on defense: Defense spending reached 10 percent of GDP and higher during the 1950s and climbed again to 8.6 percent at the height of the Vietnam War and 5.7 percent during the Reagan defense buildup of the 1980s.<sup>8</sup> The combination of industrial capacity, strategic focus and political will, and federal dollars allocated to defense allowed the U.S. to compete during—and eventually win—the Cold War.

With the fall of the Soviet Union in 1991, the U.S. entered a period of relative geopolitical stability in which it was the world's only remaining great power. Without a clear national security threat, the U.S. lacked the strategic focus that had defined the Cold War and the World War II era before it. Defense spending dwindled during this "unipolar" era, and the U.S. defense industrial base responded by consolidating and shrinking. During the same period, the nature of the global economy began to change. Commercial manufacturing increasingly



moved overseas as firms aimed to take advantage of lower labor costs in developing countries. In 1960, foreign consumer goods accounted for 8 percent of Americans' purchases, but they accounted for 60 percent in 2010.<sup>9</sup>

These changes are understandable given the conditions of the time. The U.S.'s lack of strategic focus during this era is explainable because there seemed to be no clear threats to U.S. national interests as there were during the Cold War. Some reductions in defense spending made sense during this era as leaders sought to capitalize on a post-Cold War "peace dividend." The move of manufacturing overseas was the natural consequence of economic conditions at the time. Unfortunately, all three of these trends are still visible in the makeup of the defense industrial base today in ways that leave the United States less secure.

### Defense Production Today

The defense industry in the United States today reflects both the legacy of World War II and the legacy also of the 1990s and 2000s.

**Defense Production Capacity.** The U.S. defense industry has atrophied. Prime contractors have consolidated from 51 firms down to five.<sup>10</sup> While this consolidation does not necessarily indicate a smaller defense industry, the broader ecosystem of defense subcontractors and suppliers has also shrunk: In the past five years alone, the defense sector has lost a net 17,045 companies.<sup>11</sup> The number of people employed in defense-related work has shrunk by two-thirds, from 3 million workers in 1985 to 1.1 million in 2021.<sup>12</sup>

Reduced defense spending during the 1990s and early 2000s drove some of this consolidation. In a 1991 meeting now known colloquially as the "Last Supper," then-Secretary of Defense Les Aspin informed the CEOs of the major defense prime contractors that the U.S. government would be spending less on defense, that the firms could not expect to do the same amount of business that they had done during the Cold War and especially during the 1980s defense buildup, and that they should consider consolidating in order to survive.<sup>13</sup> During this era, mergers and acquisitions (M&A) activity transformed the defense industry, particularly at the prime contractor level, leaving only a handful of firms performing work for which dozens of firms had previously competed.

**The Broader Economy.** Beyond the defense industry, the nature of the American economy is very different from what it was in the World War II era. Many of these changes have been the natural result of market forces, but they have negative implications for national security.

The U.S. is no longer primarily a manufacturing or industrial economy. In 1950, manufacturing jobs accounted for 33.7 percent of U.S. employment; today, they account for only 8.4 percent of employment.<sup>14</sup> This shift has profound implications for defense production. The nation was able to mobilize domestic manufacturing capacity to produce matériel for World War II, but far less latent manufacturing capacity is available today.

In addition, the modern economy is globally interconnected to a degree that would be hard for businessmen of the 1940s to imagine. A car assembled in South Carolina is likely made of components manufactured in dozens of other countries, and those components likely contain raw materials sourced from dozens of other countries as well. This interconnectedness means that mobilization of U.S. production will depend on suppliers based in myriad other countries—countries that may not have an interest in helping the U.S. increase its defense production or may even have an active interest in stopping it.

The U.S. economy is not just globally interconnected; as opposed to the Cold War era when the nation was relatively able to operate independently, it is heavily reliant on its chief rival and pacing threat. China is the top supplier of imported goods to the U.S.,<sup>15</sup> produces 78 percent of rare earths imported by the U.S.,<sup>16</sup> and produces 10 times as much steel and more than 40 times as much aluminum as the U.S. produces.<sup>17</sup>

While manufacturing capacity for defense goods and manufacturing capacity writ large are not the same thing, manufacturing capacity and capabilities can still potentially be mobilized over time to fill defense manufacturing needs. However, defense systems are far more complex than they were 80 years ago. An F-35 is closer to a flying supercomputer than it is to a World War II fighter aircraft.

Another problem in U.S. society today is that not all firms that are able to perform defense-related work have workforces whose ideologies completely align with the national security interests of the United States; in some cases, they do not feel that working with the U.S. military serves their

interests or aligns with their values. For example, in 2018, more than 4,000 Google employees signed a letter protesting the company’s involvement in Project Maven, which used artificial intelligence to improve drone strike targeting. In response, Google adopted a set of ethical principles governing its use of AI technology that forbade its participation in weapons or surveillance programs.<sup>18</sup> Other firms have demonstrated an unwillingness to have their products used for military purposes: Elon Musk’s StarLink satellite system, for example, has imposed periodic limitations on the use of its services in Ukraine.<sup>19</sup>

**Leaders’ Commitment to Defense.** Defense industrial strength in the past required political will and leadership just as much as it required industrial capacity. Today, Members of Congress and consecutive presidential Administrations have recognized that China poses the greatest threat to U.S. national security. The 2018 and 2022 National Defense Strategies both acknowledged this threat and made it the chief focus of U.S. strategy. Congress similarly has focused its rhetoric and even some of its legislative authority on the China challenge.

Rhetoric is largely ahead of defense spending, however. The defense budget as appropriated by Congress has grown since 2015, but not in a way that would indicate a fundamental shift to renewed great-power competition.

Three presidential Administrations have struggled to shift the U.S. strategic focus to the Indo-Pacific. The Department of Defense (DOD) uses what it calls a “sizing construct” to determine the size and types of forces that are needed to maintain America’s defense. When the Obama Administration announced its “Pacific pivot,” the DOD also shifted from the decades-old force sizing construct of being able to meet two “major regional contingencies” (MRCs) to a “one-plus” MRC construct—a shift that diminished capacity rather than increasing it. The DOD’s force sizing construct drives its war planning scenarios, and these scenarios in turn inform the military’s requirements process, determining the amount of manpower and equipment that each service will need.

There is reason to suspect that budget is driving national security strategy rather than strategy driving budget in the DOD. The public has little visibility into DOD war planning scenarios—which can be a good thing; such information should be

protected—but the limited information available seems to indicate that stockpiles of weapons, munitions, and raw materials are inadequate. Within two months of Russia’s invasion, the U.S. had sent a third of its Stinger missiles and a quarter of its Javelin missiles to Ukraine.<sup>20</sup> If those amounts of stocks are consumed that quickly in what (compared to a contest with a near-peer competitor) is a regional war, it is hard to imagine that those munitions reserves will be sufficient for potential wartime needs.

### What the Threat Environment Requires

The U.S. has entered a new era of great-power competition with China. This competition—characterized by The Heritage Foundation as a “new Cold War”—exists across multiple domains, from the economy to freedom of navigation.

The domain of greatest concern in this discussion, however, is military competition. China has modernized its military in the past decades. It has exceeded the United States in certain categories like hypersonics. Through espionage and intellectual property theft, China has stolen technologies that are found in the F-22 and F-35 aircraft and incorporated them into its own fifth-generation fighter aircraft, the J-20.<sup>21</sup> The People’s Liberation Army Navy (PLAN) has more battle force ships than the U.S. Navy, and its battle force “is expected to grow to 420 ships by 2025 and 460 ships by 2030.”<sup>22</sup>

The China threat requires that the U.S. bolster its own defense capabilities and ensure the capabilities of its allies in the region. An early step will be to facilitate the arming of Taiwan with modern weapons to deter a Chinese invasion or to fight China if deterrence fails. At current U.S. production rates, however, Taiwan will not receive the weapons it needs in the necessary time frame.

More generally, there is a sense that the DOD’s planning scenarios do not account for the realities of war with and deterrence of China. In such a situation, the DOD must honestly assess global threats, the DOD and the executive branch must use that information to develop a force structure that mitigates risk and a budget that pays for it, and the legislative branch must appropriate the necessary funding.

### Acquisition as National Security

In the past, acquisition decisions have attempted to balance effectiveness, cost, and time. Today,

however, acquisition also needs to account for the current, diminished state of the defense industrial base with a goal of not only purchasing matériel in the short term, but also developing a greater capacity to produce that matériel over the long term.

**Spending Money to Get Capacity.** The U.S. has been buying defense systems at essentially peacetime levels for decades, and the resulting industrial base cannot now support the demands of great-power competition. To create needed manufacturing capacity, the DOD must sign longer-term contracts with industry for key platforms and munitions. These contracts will necessarily cost more and must specify requirements for industry to be able to surge production for future requirements, and DOD must periodically validate industry's ability to do so. This accomplishes both the obvious goal of procuring those items and the subtler objective of building the capital equipment, facilities, and workforce that are necessary to continue producing those items. Developing manufacturing capacity takes years: Better to begin now than to wait until war begins.

The DOD needs to begin thinking beyond simply procuring items it needs. Far more attention must be paid to developing and maintaining production capacity. The ability to manufacture key defense items is a good, separate from the good of the defense items themselves. The U.S. needs the ability to surge production of munitions, fighter aircraft, and ground vehicles in addition to possessing these items themselves in order to be safe. Contracts will have to reflect this by requiring contractors to maintain certain latent production capacity, which will likely make those contracts more expensive.

To increase defense production capacity while minimizing the burden on the U.S. taxpayer—and to better arm our allies—the U.S. should encourage more Foreign Military Sales (FMS). Currently, the FMS process is structured for peacetime and involves lengthy bureaucratic processes. These delays are severe enough that allies have recently chosen to buy their weapons systems elsewhere. For example, Poland recently chose to buy tanks from South Korea instead of the U.S.<sup>23</sup> Both the State Department and the DOD have announced new changes aimed at accelerating slow FMS processes with new internal deadlines for key processes; special expedited treatment in cases involving direct U.S. defense interests (arming Taiwan, for example);

and a new “FMS Continuous Process Improvement Board” reporting to the Secretary of Defense.<sup>24</sup>

The greatest cause of FMS delays, however, is a lack of capacity in the defense industrial base. To remedy that, more aggressive contracting strategies that require contractors to increase capacity and deliver faster will be needed.

**Identifying Specific Risks.** Beyond the general issue of limited defense manufacturing capacity, different specific risks exist in the supply chains for different acquisition programs. Ensuring a strong industrial base will require strategic thinking, in addition to investment, to mitigate these risks. Currently, policymakers' understanding of these issues is largely anecdotal. The American public knows about 155 mm shells, Javelins, and Stingers only because the war in Ukraine “pulled the sheets off the bed.”

There is no routine mechanism for policymakers to understand these risks. Even the DOD's own annual industrial base reports (publication of which the Biden Administration has delayed for years despite annual publication being required by law) are unhelpful because they have anecdotal information but no metrics. Without better assessment of industrial base vulnerabilities, efforts to strengthen the industrial base will be immethodical and potentially wasteful of scarce resources.

One risk that currently impacts defense production is the DOD's lack of supply chain visibility. The DOD cannot address problems it does not understand. Supply chain visibility refers to the ability of the customer (the DOD in this case) and the prime contractor to “see” clearly into the lowest tiers of their supporting supply chains.

In the current acquisition system, no single actor has full visibility into supply chains for defense programs. The DOD delegates this responsibility to prime contractors, and prime contractors typically follow the government's example and include supply chain management in their contracts with their first-tier subcontractors, extending their knowledge only one layer deep. Those subcontractors follow suit in their contracts with second-tier subcontractors and so on down the chain. As a result, prime contractors usually understand their supply chains only down through the first few tiers; beyond that, they trust their subcontractors to manage their subcontractors and so on.

Greater visibility into defense supply chains would reveal current risks like dependence on

China for raw materials and even certain components. As a case study, in September 2022, the DOD halted deliveries of Lockheed Martin’s F-35 after finding that a cobalt and samarium alloy used in magnets for the plane’s turbomachine pumps was made in China. The DOD discovered this violation only after Lockheed Martin was notified by Honeywell (the maker of F-35 turbomachines), which was told by its lube pump supplier, which was told by its magnet supplier that the firm had used an alloy manufactured in China in violation of DOD acquisition regulations.<sup>25</sup>

In this case, dependence on China carried a significant yet comparatively small cost: delayed deliveries of a vital defense system while a new, compliant supplier was found. However, similarly imperfect knowledge of defense supply chains extends across the entire defense industrial base and carries huge risk. If the U.S. went to war with China, economic ties between them would be completely severed. The Pentagon would quickly learn which defense components were made in China because contractors suddenly would not have access to them. Production of key weapons could grind to a halt at a time when those weapons are desperately needed.<sup>26</sup>

Another common supply chain vulnerability is single-source suppliers for defense system components. In many cases, there is only one company making a subsystem or component for a defense system. This creates potential choke points in manufacturing capacity: For example, an aircraft manufacturer may have more capacity to increase production in its final assembly plant, but its limiting factor on production is a sub-tier supplier’s limited capacity to produce landing gear assemblies.

A lack of redundancy also makes the supply chain more fragile: If a sole-source supplier is no longer able to produce a given component, it can shut down production for the entire system. A good example of this risk is the explosion that occurred at the U.S.’s only black powder mill in Minden, Louisiana. The plant was offline for two years after the explosion occurred, forcing contractors to draw from black powder stockpiles in order to produce the munitions that use black powder to ignite more powerful explosives.<sup>27</sup> Again, what makes these situations all the more dangerous is that the DOD normally does not understand its own vulnerability until a problem develops—and then it is too late to address it.

The DOD needs better visibility into the defense industrial base with a greater understanding of the supply chains that link the entire ecosystem in order to mitigate risk. Fortunately, there are tools today to gather, maintain, and analyze this information (such as artificial intelligence and even blockchain technology) that did not exist in earlier eras of U.S. defense production. These data tools should be applied to a risk management framework that assesses both the probability of a defense supply chain disruption and how consequential such a disruption would be. With more granular information, the DOD could better target its limited resources to areas of the defense industrial base that require the most urgent attention.

**Mitigating Risk.** Vulnerabilities in the defense industrial base should be mitigated in ways that account for the unique facets of each sector, and even each acquisition program, and the particularities of their weaknesses. However, just as there are common threads linking all these defense industrial base vulnerabilities, there are common mitigations that can make up a “tool kit” for defense policymakers.

One important type of tool is multiyear and block-buy contracting. Whereas typical procurement processes require the DOD to use a contract for each year’s purchases, multiyear procurement authorities allow the DOD to buy and commit funding for up to five years’ worth of an item in one contract with penalties to the government if it breaks this purchase commitment. These longer-term commitments give contractors the stability they need to invest in facilities and workforce. Multiyear contracts also generate savings for the government because optimizing production over a longer-term period creates efficiencies. Multiyear and block-buy contracts should be used more often to reap these benefits.

Another, more interventionist tool is Title III of the Defense Production Act (DPA), which grants authority to the President to “create, maintain, protect, expand, or restore domestic industrial base capabilities” using funds allocated specifically for that purpose. These authorities have been used to incentivize businesses to enter the defense space or to expand their capabilities and have served both to create domestic production capabilities for items typically procured from overseas and to strengthen the fragile domestic supply base.<sup>28</sup>

For example, in 2020, the DOD announced multiple DPA Title III funding awards to domestic rare earth element producers to expand their mining and refining capacity, thereby creating a more secure supply chain for defense applications of these materials. More recently, President Biden used DPA authorities to build up domestic hypersonic weapons manufacturing capacity. Such tools have value for very urgent national defense needs, but should be used only when market forces and DOD procurement practices are unable to generate the necessary conditions for a particular defense industrial production capability.

**An Acquisition Strategy for a New Era.** Today, acquisition success is measured according to three variables: cost, schedule, and performance. A fourth factor—resilience—must be added to this paradigm. The terms of every defense contract should take into account the risks to production of that platform or munition. For certain items, they should also require the contractor to maintain surge production capacity; facilities should no longer be optimized to produce the exact amount required for immediate needs and should instead have built-in

latent capacity. The DOD (and Congress) should spend the extra money required to maintain that surge capacity, and the new emphasis on resilience should be taught to the acquisition workforce through training at Defense Acquisition University.

## Conclusion

The story of allied victory in WWII—and of U.S. military superiority in the decades that followed—in addition to the great feats of arms, can also be understood in terms of U.S. industrial might: the strength of its defense industrial base, undergirded by a thriving manufacturing economy and defense-focused leadership. Because those economic and political conditions do not exist today, the defense industrial base is not well-positioned for a new era of great-power competition.

Improving defense industrial performance does not mean recreating former economic and political conditions. It means working within conditions today and leveraging new technology to strategically grow and strengthen targeted U.S. defense industrial capacity.

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# Understanding the Defense Budget

Frederico Bartels

Like the familiar drawings that appear to be a duck or a rabbit to different people, when people talk about the defense budget, it often seems they might be talking about completely different things. There are many different accounts and permutations of what could properly be considered the U.S. “defense budget.” From a narrow view of the direct resources under the control of the Department of Defense (DOD) to a much broader view of discretionary versus mandatory spending, many nuances need to be considered if one is to have an informed discussion or understanding of the U.S. defense budget.

This essay is meant to provide a better understanding of the resources that are dedicated to our national defense. The goal is not to give a definitive answer, but rather to give people the information they need to arrive at conclusions that are as well-informed as possible. In addition to definitional elements, where individuals are located within the U.S. national security apparatus plays a key role in how they define the defense budget.

All of these perspectives, however, should use the Constitution of the United States as their starting point.

## The Constitutional Foundation

In the Preamble to the Constitution of the United States, the Founders state that the government has the responsibility to “provide for the common defence.”<sup>1</sup> This is restated in Article 1, Section 8, as one of Congress’s enumerated powers.<sup>2</sup> The Heritage Foundation’s *Guide to the Constitution* calls this purpose “obvious—after all, it was by this means the United States came into being.”<sup>3</sup>

The crucial political question is: How we are to define what it means to provide for the common

defense, how much “defense is enough,” and how much we as a nation are willing to pay for that defense? The constitutional need to provide for the common defense is the starting point for understanding the role of the armed forces within the American political context, but it is not the final word by any means. What *is* clear is that defense—unlike many of the other activities that are currently undertaken by the federal government—is a fundamental constitutional responsibility.

Providing a common defense is understood in the Constitution as a function that can be performed only by the Union and thus resides unambiguously at the federal level. Many governmental functions, such as the provision of public security by localities or the state-level provision of identity cards, can and should be conducted and administered at lower levels of government. Common defense is not such a function.

Many organizations at the federal level have a role in our national defense, and there are substantial differences in what could be considered the defense budget that reflect the perspective of the organization or person talking about the defense budget. Many countries, for example, consider expenditures associated with support to veterans as part of their defense budget, while the United States has a separate Department of Veterans Affairs that is not usually considered part of the defense budget.

## What Is the Defense Budget?

When discussing the defense budget, one should always begin by defining the terms being used. Depending on who is talking about the defense budget and the message being highlighted, different numbers can be used. In many cases, the choices being offered depend on how the specific institutions

TABLE 2

## U.S. Defense Budget

| In Millions of Budget Authority                                     | 2022             | 2023             | 2024             | 2025             | 2026             | 2027             | 2028             |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>050 National Defense</b>   |                  |                  |                  |                  |                  |                  |                  |
| <i>Discretionary</i>  |                  |                  |                  |                  |                  |                  |                  |
| 051 Department of Defense-Military                                  | 776,639          | 848,813          | 842,009          | 859,709          | 877,709          | 896,210          | 915,010          |
| 053 Atomic energy defense activities                                | 29,107           | 31,560           | 32,846           | 34,009           | 34,740           | 35,489           | 36,100           |
| 054 Defense-related activities                                      | 10,578           | 10,990           | 11,523           | 11,602           | 11,871           | 12,001           | 12,390           |
| <i>Total, Discretionary</i>   | <i>816,324</i>   | <i>891,363</i>   | <i>886,378</i>   | <i>905,320</i>   | <i>924,320</i>   | <i>943,700</i>   | <i>963,500</i>   |
| <i>Mandatory</i>  |                  |                  |                  |                  |                  |                  |                  |
| 051 Department of Defense-Military                                  | 19,092           | 11,363           | 21,482           | 21,569           | 21,854           | 22,271           | 22,333           |
| 053 Atomic energy defense activities                                | 2,850            | 2,168            | 2,298            | 2,399            | 2,494            | 2,564            | 2,589            |
| 054 Defense-related activities                                      | 548              | 564              | 594              | 514              | 514              | 514              | 514              |
| <i>Total, Mandatory</i>   | <i>22,490</i>    | <i>14,095</i>    | <i>24,374</i>    | <i>24,482</i>    | <i>24,862</i>    | <i>25,349</i>    | <i>25,436</i>    |
| <b>Total, National Defense</b>                                      | <b>838,814</b>   | <b>905,458</b>   | <b>910,752</b>   | <b>929,802</b>   | <b>949,182</b>   | <b>969,049</b>   | <b>988,936</b>   |
| <b>700 Veterans Benefits and Services</b>                           |                  |                  |                  |                  |                  |                  |                  |
| <i>Discretionary</i>  |                  |                  |                  |                  |                  |                  |                  |
| 701 Income security for veterans                                    | 77               | 152              | 77               | 79               | 80               | 83               | 84               |
| 702 Veterans education, training, and rehabilitation                | 61               | 66               | 66               | 68               | 69               | 71               | 72               |
| 703 Hospital and medical care for veterans                          | 102,596          | 123,612          | 125,732          | 117,416          | 120,121          | 122,881          | 125,706          |
| 704 Veterans housing  | 232              | 284              | 320              | 327              | 335              | 342              | 350              |
| 705 Other veterans benefits and services                            | 9,918            | 11,304           | 12,285           | 12,568           | 12,854           | 13,150           | 13,454           |
| <i>Total, Discretionary</i>   | <i>112,884</i>   | <i>135,418</i>   | <i>138,480</i>   | <i>130,458</i>   | <i>133,459</i>   | <i>136,527</i>   | <i>139,666</i>   |
| <i>Mandatory</i>  |                  |                  |                  |                  |                  |                  |                  |
| 701 Income security for veterans                                    | 139,638          | 152,394          | 151,675          | 181,557          | 193,802          | 206,865          | 220,408          |
| 702 Veterans education, training, and rehabilitation                | 14,962           | 8,995            | 8,543            | 11,579           | 13,896           | 14,301           | 15,422           |
| 703 Hospital and medical care for veterans                          | 938              | 5,704            | 19,208           | 21,719           | 24,835           | 26,325           | 27,466           |
| 704 Veterans housing  | 1,375            | 211              | -168             | -156             | -138             | -120             | -105             |
| 705 Other veterans benefits and services                            | 416              | 1,183            | 3,112            | 2,943            | 2,784            | 2,713            | 2,771            |
| <i>Total, Mandatory</i>   | <i>157,329</i>   | <i>168,487</i>   | <i>182,370</i>   | <i>217,642</i>   | <i>235,179</i>   | <i>250,084</i>   | <i>265,962</i>   |
| <b>Total, Veterans Benefits and Services</b>                        | <b>270,213</b>   | <b>303,905</b>   | <b>320,850</b>   | <b>348,100</b>   | <b>368,638</b>   | <b>386,611</b>   | <b>405,628</b>   |
| <b>Retirement</b>   |                  |                  |                  |                  |                  |                  |                  |
| 602 Federal Employee Retirement and Disability                      |                  |                  |                  |                  |                  |                  |                  |
| Mandatory, Military Retirement                                      | 66,724           | 74,169           | 78,224           | 80,715           | 83,014           | 85,347           | 87,694           |
| 902 Interest received by on-budget trust funds                      |                  |                  |                  |                  |                  |                  |                  |
| Mandatory, Military Retirement                                      | -84,276          | -68,848          | -51,711          | -46,635          | -58,528          | -62,994          | -60,938          |
| 951 Employer share, employee retirement (on-budget)                 |                  |                  |                  |                  |                  |                  |                  |
| Mandatory, Employing agency contributions, military retirement fund | -36,578          | -39,521          | -45,577          | -46,570          | -47,478          | -48,326          | -49,239          |
| <b>Total, Mandatory Military Retirement</b>                         | <b>-54,130</b>   | <b>-34,200</b>   | <b>-19,064</b>   | <b>-12,490</b>   | <b>-22,992</b>   | <b>-25,973</b>   | <b>-22,483</b>   |
| <i>Total, Discretionary</i>   | <i>929,208</i>   | <i>1,026,781</i> | <i>1,024,858</i> | <i>1,035,778</i> | <i>1,057,779</i> | <i>1,080,227</i> | <i>1,103,166</i> |
| <i>Total, Mandatory</i>   | <i>125,689</i>   | <i>148,382</i>   | <i>187,680</i>   | <i>229,634</i>   | <i>237,049</i>   | <i>249,460</i>   | <i>268,915</i>   |
| <b>Total</b>  | <b>1,054,897</b> | <b>1,175,163</b> | <b>1,212,538</b> | <b>1,265,412</b> | <b>1,294,828</b> | <b>1,329,687</b> | <b>1,372,081</b> |

**SOURCE:** Table 21-12, "Net Budget Authority by Function, Category, and Program," Office of Management and Budget, *Budget of the U.S. Government FY 2024: Analytical Perspectives*, [https://www.whitehouse.gov/wp-content/uploads/2023/03/24-1\\_fy2024.xlsx](https://www.whitehouse.gov/wp-content/uploads/2023/03/24-1_fy2024.xlsx) (accessed September 9, 2023).

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TABLE 3

## Department of Defense Funding, by Military Department

| Budget Authority, in Millions of Current Dollars | FY 2022        | FY 2023 Enacted | FY 2024        | FY 2025        | FY 2026        | FY 2027        | FY 2028        |
|--|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| Army   | 182,937        | 190,824         | 185,334        | 187,077        | 189,358        | 191,835        | 195,005        |
| Navy   | 223,012        | 244,697         | 255,998        | 258,371        | 263,035        | 263,611        | 268,895        |
| Air Force  | 223,126        | 248,879         | 259,070        | 263,099        | 267,493        | 273,743        | 280,148        |
| Defense-Wide                                     | 166,654        | 178,753         | 163,035        | 166,286        | 173,306        | 182,895        | 186,862        |
| War Outyear Placeholder                          |                |                 |                | 6,000          | 6,000          | 6,000          | 6,000          |
| <b>Total</b>                                     | <b>795,730</b> | <b>863,153</b>  | <b>863,437</b> | <b>880,833</b> | <b>899,193</b> | <b>918,085</b> | <b>936,910</b> |

**SOURCE:** U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 9, 2023).

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define the terms, and the implications are not immediately obvious.

Even within the executive branch, the Office of Management and Budget (OMB) and the Department of Defense have different concepts of the “defense budget.” Congress has still another definition because it is organized by committees and focuses its attention on the different appropriations and authorization bills.

There is an initial division between discretionary and mandatory spending in the defense budget just as there is in the overall federal budget. Discretionary spending is the element of the budget that is annually debated and appropriated by Congress. Mandatory spending, on the other hand, is not debated annually and is defined largely by formulas that govern the various benefit programs operated by the federal government such as Social Security and Medicare.<sup>4</sup> The defense budget includes both mandatory and discretionary funding, but most defense dollars are classified as discretionary.

Table 2 contains different possible combinations of what could be considered colloquially as the “defense budget.” This table is based on OMB’s projections and categories, which can provide a fuller picture because it incorporates both mandatory and discretionary spending and contains data on every government agency. Realistically, the defense budget for fiscal year (FY) 2024, for instance,

could be said to be as low as \$842 billion if you focus just on discretionary spending controlled by the Department of Defense or as high as \$1.2 trillion if you include Veterans Affairs and other possible mandatory spending.

Of the many possible ways to consider the defense budget, it is important to highlight a few of the ones that are most commonly used in the executive branch. The first one, known as 050, encompasses the DOD, Atomic Energy Defense Activities within the Department of Energy,<sup>5</sup> and other defense-related activities. This category was utilized in the Budget Control Act of 2011 to cap discretionary spending. It was also used in the legislation that raised the debt ceiling in 2024. Another important category, known as 051, is the DOD’s portion of the national defense budget within OMB tables. It constitutes the major portion of 050 but is usually discussed and debated separately from the other functions within the category and is often referenced as the “defense budget.”

Within the DOD itself, different sets of numbers are used to define the defense budget. As one would expect, the first is the 051 category because these are the funds under the DOD’s control and include both mandatory and discretionary spending. Category 051 numbers can be described as the defense budget, and in many reports and news stories, these are the numbers that are most often used. Table 3

TABLE 4

## Defense Funding, by Public Law Title

| In Millions of Current Dollars | FY 2022        | FY 2023 Enacted | FY 2024        | FY 2025        | FY 2026        | FY 2027        | FY 2028        |
|--------------------------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| Military Personnel             | 178,094        | 183,057         | 199,570        | 215,793        | 221,377        | 226,433        | 233,143        |
| Operation and Maintenance      | 320,208        | 352,786         | 330,751        | 318,410        | 325,895        | 338,835        | 348,154        |
| Procurement                    | 153,644        | 167,084         | 170,348        | 175,305        | 185,976        | 186,280        | 191,335        |
| RDT&E                          | 119,347        | 140,650         | 145,791        | 145,480        | 141,332        | 144,026        | 142,475        |
| Military Construction          | 13,376         | 16,714          | 14,734         | 16,344         | 15,532         | 13,370         | 12,956         |
| Family Housing                 | 1,549          | 2,354           | 1,941          | 1,890          | 1,617          | 1,806          | 1,862          |
| Revolving and Management Funds | 10,828         | 1,718           | 1,683          | 1,550          | 1,524          | 1,536          | 1,567          |
| Trust, Receipts, and Other     | -1,316         | -1,210          | -1,380         | 62             | -59            | -202           | -582           |
| War Outyear Placeholder        |                |                 |                | 6,000          | 6,000          | 6,000          | 6,000          |
| <b>Total</b>                   | <b>795,730</b> | <b>863,153</b>  | <b>863,437</b> | <b>880,833</b> | <b>899,193</b> | <b>918,085</b> | <b>936,910</b> |

**SOURCE:** U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 9, 2023).

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shows the budget for the Department of Defense broken down by military department, which is different from the OMB data in Table 2.

One additional set of numbers that is commonly discussed and characterized as the defense budget is the funding appropriated by Congress. Because the Constitution specifies that Congress must appropriate every dollar that is withdrawn from the Treasury, appropriations bills are among the most crucial pieces of legislation that are passed in any fiscal year.

The Department of Defense receives resources mainly through two distinct appropriations bills: Defense Appropriations and Military Construction, Veterans Affairs, and Related Agencies Appropriations. This division reflects the different public law titles and the characteristics of appropriated dollars that compose the defense budget.

The defense appropriations bill includes military personnel; operations and maintenance, procurement; research, development, testing, and evaluation (RDT&E); and revolving funds as shown in

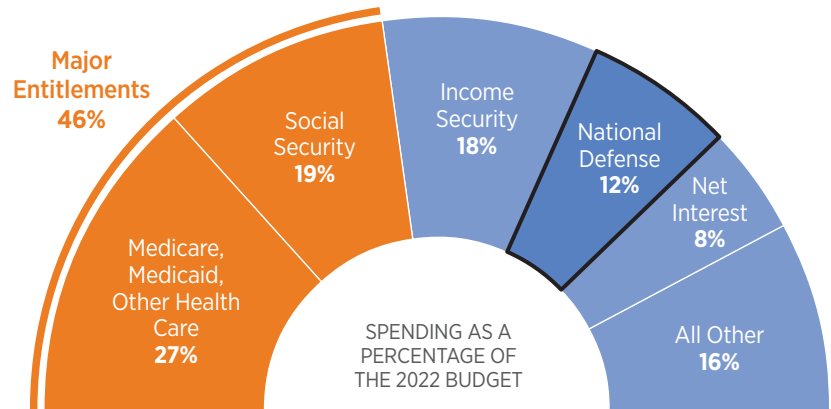
Table 4. Military construction appropriations include mainly military construction funds and family housing. Table 4 depicts funding (both appropriated and projected) for various fiscal years broken down by public law title.

Beyond the appropriations bill, the same resources that the Department of Defense receives are also authorized by the National Defense Authorization Act (NDAA), a bill that has been passed and has grown in length for more than 60 consecutive years. The DOD is one of the very few federal departments that reliably has its funding both authorized and appropriated.<sup>6</sup> The NDAA is sometimes referred to as a defense policy bill because it does not actually appropriate dollars to the DOD; it sets policy and establishes limitations on how the appropriated dollars will be used through the fiscal year. The NDAA includes important measures that have both financial and practical implications for how the nation provides for the common defense.

Altogether, there are several ways to talk about and represent the defense budget. The first thing

## Where Does All the Money Go?

**SOURCE:** Office of Management and Budget, *Historical Tables*, “Table 3.2—Outlays by Function and Subfunction: 1962–2028,” <https://www.whitehouse.gov/omb/budget/historical-tables/> (accessed September 9, 2023).



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that an informed reader should do is understand who is communicating so he or she can understand what that person means by the defense budget.

It is also important to know that defense is not the biggest item in the federal budget; entitlements have that distinction.<sup>7</sup> Nor is defense spending the primary factor driving the nation’s financial problems, especially the explosive growth in public debt and the annual federal budget deficit. In addition, current plans have the relative burden of defense decreasing over time as the economy grows. Understanding the broader context of the federal budget is therefore very important when considering the defense budget.

### The Burden of Defense on the Federal Budget

As in all things related to the budget, it is important to understand the burden of any financial expense relative to the available resources and the importance associated with the tasks that are being resourced. When commentators focus narrowly on discretionary spending, defense is usually noted as commanding a huge share of the budget. However, when one looks at the whole of the federal budget, the picture is quite different. This difference is portrayed in Chart 2.

In the context of the whole federal budget, in FY 2022, national defense as defined by the OMB consumed 12 percent of the federal budget. This is by no means an insignificant amount, but it is dwarfed by other federal expenditures, including health care insurance and provision, income security, and many

other governmental functions for which Washington is currently responsible.

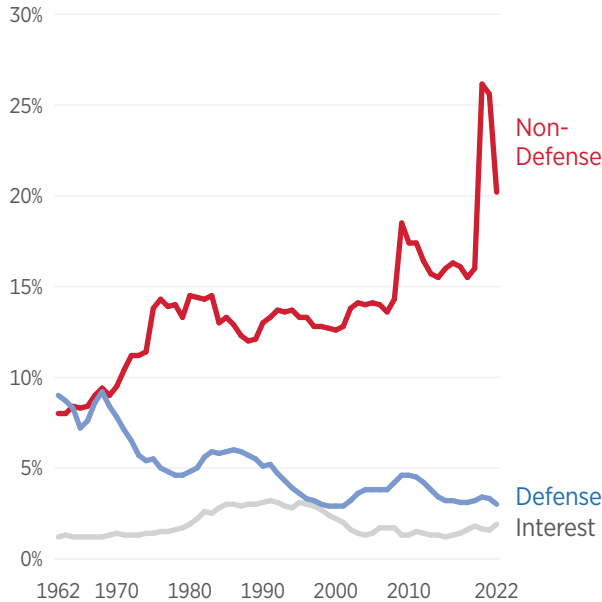
Medicare, Medicaid, and other health care spending accounts together comprise the biggest portion of the budget: 27 percent. Social Security constitutes the second biggest element at 19 percent. Income Security—a collection of programs such as Civil Service Retirement and Disability, Earned Income and Child Tax Credits, the Supplemental Nutrition Assistance Program, and Housing Assistance—follows closely at 18 percent. The 12 percent representing the broader national defense enterprise is followed closely by net interest on our debt, which currently stands at 8 percent, although the burden of servicing our national debt through interest payments is likely to increase as interest rates in the United States rise.<sup>8</sup> Every other function of the federal government, from the administration of justice to the collection of taxes, accounts for the remaining 16 percent. It is important to keep in mind how the government truly allocates taxpayers’ dollars when considering the defense budget.

It is also important to understand the size of the federal government’s obligation when compared to the nation’s gross domestic product (GDP). Chart 3 portrays how much of the nation’s GDP is consumed by three different categories of federal spending that include both mandatory and discretionary spending: defense, non-defense, and interest on our national debt. This picture conveys two important messages:

CHART 3

## Non-Defense Spending Consuming More GDP

SPENDING AS A PERCENTAGE OF GDP



**SOURCE:** Table 8.4, “Outlays by Budget Enforcement Act Category as Percentages of GDP: 1962–2028,” Office of Management and Budget, *Historical Tables*, <https://www.whitehouse.gov/omb/budget/historical-tables/> (accessed September 9, 2023).

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- The relative burden of our national defense has declined steadily over the past 60 years and
- The portion of government resources allocated to the provision of non-defense services and goods has increased substantially over time.

Chart 3 also provides a valuable baseline for the cost of interest on our national debt over the past 60 years—a consideration that has become increasingly relevant as interest rates have risen in the past few years.<sup>9</sup>

All in all, the relative burden of defense has gone down over the past 60 years. Put another way, defense has become more affordable for the country.

## Trajectory of the Defense Budget

The Department of Defense organizes and reports on its budget in multiple categories and with multiple ways of displaying the information in a yearly document, the *National Defense Budget Estimates*, commonly known as the “Green Book” because of its seafoam green cover pages.<sup>10</sup> Many of its tables contain data back to FY 1948. Many also contain estimates for the coming four fiscal years.

The Green Book also provides three different categories of resources: budget authority (BA); total obligational authority (TOA); and outlays. The simplest differentiation of these is that budget authority includes the new yearly resources that the department can obligate; total obligational authority counts resources appropriated in previous years that can be obligated in a different fiscal year; and outlays are actual disbursements made by the Treasury on behalf of the DOD. Of these, budget authority is the term used most frequently in public debate because it reflects the resources appropriated in the current fiscal year.

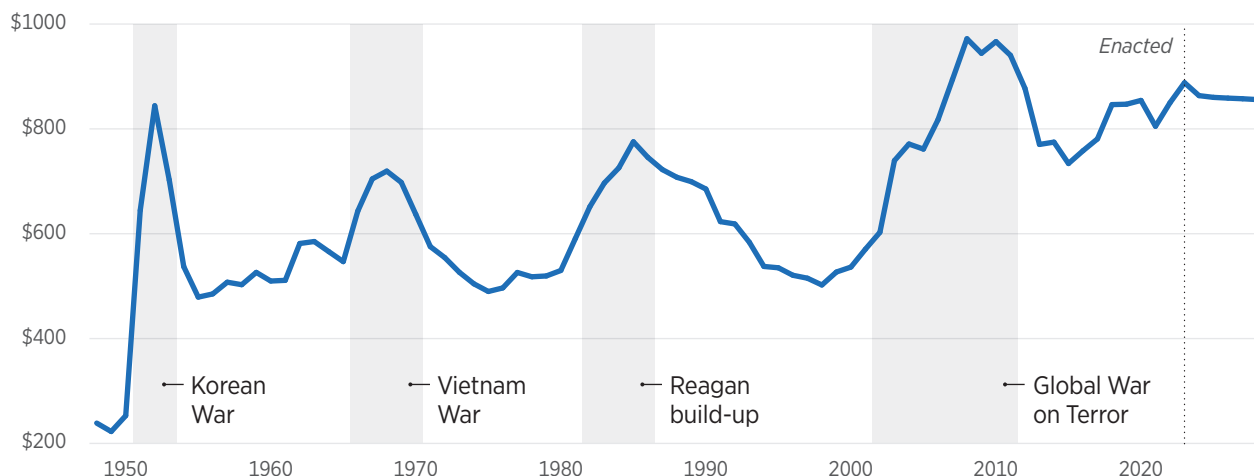
There is another differentiator that is relevant to understanding the data provided by the DOD: current versus constant dollars. Current dollars represent the face value of an item in the present, as if you are spending money today to buy that item. When people reminisce about a bottle of Coke in the 1950s costing less than a dollar, they are talking about current dollars. Constant dollars, on the other hand, represent a price relative to a past price in a given base year, usually the current year—for example, how much a bullet cost in 1978 adjusted to be in 2024 dollars—thus accounting for the effect of inflation over time. Currently, there is a broader appreciation of this difference because of the recent spikes in the inflation experienced by the public.

The Department of Defense was created in 1947, and Chart 4 contains both mandatory and discretionary budget authority in FY 2024 constant dollars for the DOD since FY 1948. Because of its normalization with constant dollars, the chart provides a more informative picture of the resources that have been allocated to the DOD and, more important, of the relative resources that it had available over time to purchase goods and services. The constant dollar number is an approximation that is derived from an economic understanding of rising costs and inflation. It is not a perfect representation

CHART 4

## Total Defense Spending

IN BILLIONS OF CONSTANT DOLLARS



**SOURCE:** U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 9, 2023).

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of the historical value of the dollar, but it provides a useful perspective.

Chart 4 reveals four distinct peaks and troughs in the defense budget during the past 70 years: the Korean War, the Vietnam War, the Reagan military buildup, and the global war on terrorism. These increases reflect different periods in our recent history when there was a renewed attention and commitment to the military driven by both internal and external events. In these periods, the nation allocated more resources to its military. All are followed by reductions in defense spending, reflecting the nation's sense that a danger had passed and it could invest less in its military.

Each of these waves reflects a combination of geopolitical pressures and internal politics. It is worth noting that the Korean War generates a more abrupt peak and trough, while the other peaks are smoother and take longer both to materialize and to dissipate. In the end, the defense budget is the product of political debate and considerations and thus reflects the political environment and how the leadership interprets and reacts to it.

During the Korean War, there was a quick spike that peaked in FY 1952 with \$844 billion allocated to the Department of Defense. It is followed by the end of the war and a sharp drop in FY 1955 to \$479 billion. It is worth noting that the data start in FY 1948 during the post-World War II era when military expenditures were severely reduced. Between FY 1948 and FY 1950, the DOD's budget fluctuated at around \$238 billion a year—a low point even when compared to the aftermath of the Korean War.

The next peak comes in FY 1968 during the Vietnam War when the Department of Defense had a \$719 billion budget. After that peak, there was a slow and consistent decline until FY 1975 when the department's budget reached a trough of \$489 billion. This decline lasted for about five fiscal years. Then, in FY 1980, the department's budget began an upswing that peaked in FY 1985 at \$775 billion, largely under the Reagan Administration's military buildup. Between FY 1986 and FY 1998, the defense budget once again consistently declined, reaching a low of \$502 billion in FY 1998.

After FY 1998, the defense budget started to climb again, a climb that was accelerated by the September 11, 2001, attacks and the nation's subsequent response to them with wars in Afghanistan and Iraq. It peaked in FY 2008 with \$971 billion allocated to the DOD. Interestingly, there was a quick drop in FY 2009 to \$944 billion, then an increase in FY 2010 to \$966 billion before another sustained decline that lasted until FY 2015 when the defense budget reached \$733 billion.

Since FY 2016, there has been some increase in the defense budget, but it is still far from either a peak or a trough. In the past eight years, there have been slight increases and slight decreases with an annual average of \$828 billion. There is not enough direction or time to serve as the basis for a concrete determination about the trend of the defense budget in recent years.

Fundamentally, the defense budget's increase in constant dollars reflects our nation's changed expectations of what the Department of Defense should do, how it should do it, and the availability of technology. The DOD's mission has expanded significantly in the decades since the department was created. Today, the department not only prepares and fight wars, but also runs recruiting stations spread out across the country, runs schools and supermarket chains and medical facilities, and purchases billions of dollars of services and goods every year. Even small military bases provide multiple services from small sandwich shops to facilities that maintain extra-large airplanes.

Today's DOD is expected to be able to mobilize within a moment's notice and deploy almost anywhere in the world. Maintaining this level of preparedness and planning takes a substantial number of resources, both in manpower and in material. The United States' armed forces have prepositioned stocks in strategic locations around the world, which is what allowed American forces in Korea to transfer equipment to Ukraine.<sup>11</sup>

The DOD also has unique requirements both in terms of security and in terms of material conditions that are fundamentally different from those of the commercial sector. Any DOD information technology system will have to handle access by at least three different types of users—military, civilian, and contractors—with different levels of access to information, even if they are only accessing unclassified information. The infrastructure required

by our armed forces is incredibly detailed and prescriptive because they deal with matters of life or death. It goes hand in hand with our society's expectation that our armed forces will value the lives of our servicemembers and the individuals who interact with them.

This is what Americans have come to expect from their armed forces, and it does carry a price tag.

## The Defense Budget and the Military Departments

The Department of Defense is composed of three military departments—Army, Navy, and Air Force—and multiple agencies and field activities that are grouped under a budgetary category called defense-wide. Each of the five military services resides within one specific military department: The Department of the Army oversees the U.S. Army; the Department of the Navy, the U.S. Navy and U.S. Marine Corps; and the Department of the Air Force, the U.S. Air Force and U.S. Space Force. The agencies and activities provide support functions to all of the military departments and services. Examples include the Defense Logistics Agency, the Defense Financial and Accounting Service, and a majority of the medical care expenses and many of the intelligence functions within DOD.<sup>12</sup>

These organizations collectively are known as the “fourth estate,” and most of their efforts represent efforts to consolidate and standardize some support activities that are common to all military departments. Each of these organizations within the DOD receives a portion of the defense budget.

There are many public discussions about the share of the budget that each of the military departments receives and whether such distribution should be equitable. However, the portion of the budget that each receives is *not* equal to the shares that others receive and has fluctuated greatly over time.<sup>13</sup> Depending on the technological developments of the time and the external threats to which the armed forces were responding, the share received by each of the services has ebbed and flowed to account for the different challenges. The Army, for example, received a higher proportion of defense dollars in the years following the September 11, 2001, terrorist attacks because of the land wars in Iraq and Afghanistan, while the Air Force received a substantially larger share when it was establishing itself and there was an emphasis on



air power and nuclear weapons under President Dwight Eisenhower.

Another aspect of the budget that deserves attention is the growth of defense-wide accounts that are associated with defense agencies outside of the military departments. They started as a few individual programs that were later centralized and as specific business functions that were made uniform and have since then expanded, progressively consuming a larger portion of the budget. The growth of these accounts since FY 1948 is depicted in Chart 5. These accounts have grown from a low of 0.7 percent of the defense budget in FY 1952 to a peak of close to 21 percent in FY 2022.

This is not to say that resources should not be allocated outside of the military services. The point is that there is a large portion of the defense budget, which has been consistently rising in recent years, that is controlled by different agencies and activities rather than by any of the military departments. During his tenure as Secretary of Defense, Dr. Mark Esper tried to consolidate the budget, shifting budget authorities and oversight over the defense agencies and field activities to the Chief Management Officer,<sup>14</sup> but the office was not given enough time to mature and properly control the resources of the fourth estate.<sup>15</sup>

The common argument that each of the military departments receives a third of the defense budget and that it is a zero-sum game among the services is inaccurate. It does not consider the changes that take place over time and the significant role of defense agencies and field activities within the budget.

### Changing Nature of the Defense Budget

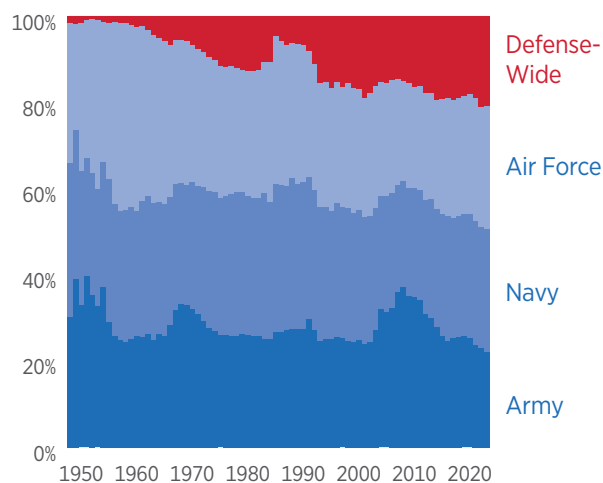
Since the end of World War II, the decrease in the number of members of the Armed Forces and the increased presence and complexity of technology have forced a substantial change in how the DOD allocates its resources. Chart 6 shows how the number of total active military personnel has decreased substantially from a peak of 3.6 million in FY 1952 to a low of 1.37 million in FY 2015. The last time the United States had 2 million individuals in its armed forces was in FY 1991. The U.S. has been reducing the active members of its armed forces since FY 1987.

The data also reveal how the DOD has invested a higher proportion of its resources in the category of non-pay items, which in this instance amounts to

CHART 5

## Growth of the Fourth Estate

SHARE OF TOTAL DEFENSE SPENDING, BY DEPARTMENT



**NOTE:** Due to transfers between defense accounts during the Persian Gulf War, the defense-wide figure for 1991 is shown as the interpolated value between 1990 and 1992.

**SOURCE:** U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 9, 2023).

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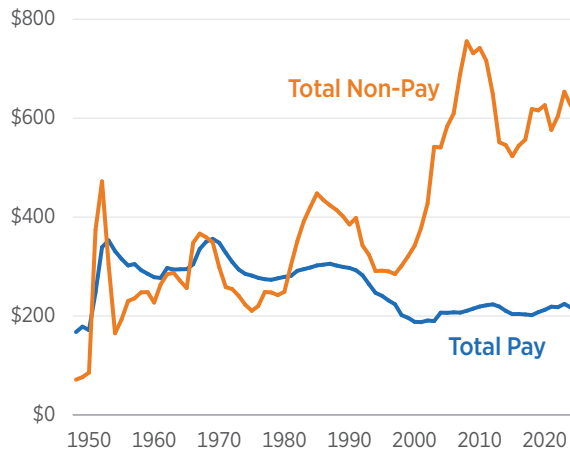
operations and investment—in other words, what it costs to equip and operate the force. In hypersimplified terms, pay is the cost of establishing the force and non-pay is the cost of using that force.

This is consistent with the technological evolution that the United States has experienced as a society over the past 70 years as the tools of war have become increasingly capable, complex, and costly. Every tool and machine that we have at our disposal today is undoubtedly more capable than those that our parents and grandparents had at their disposal. That is also true in the military where the information technology revolution has influenced everything from how people communicate to how weapon systems operate. These systems and support services are more complex, more capable, and more expensive to maintain and operate. Additionally, servicemembers have higher expectations with

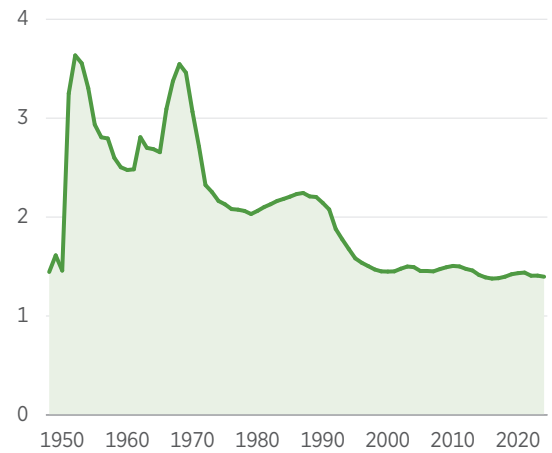
CHART 6

## Changing Drivers of Defense Budget

DEFENSE SPENDING, IN BILLIONS OF DOLLARS



TOTAL ACTIVE MILITARY PERSONNEL, IN MILLIONS



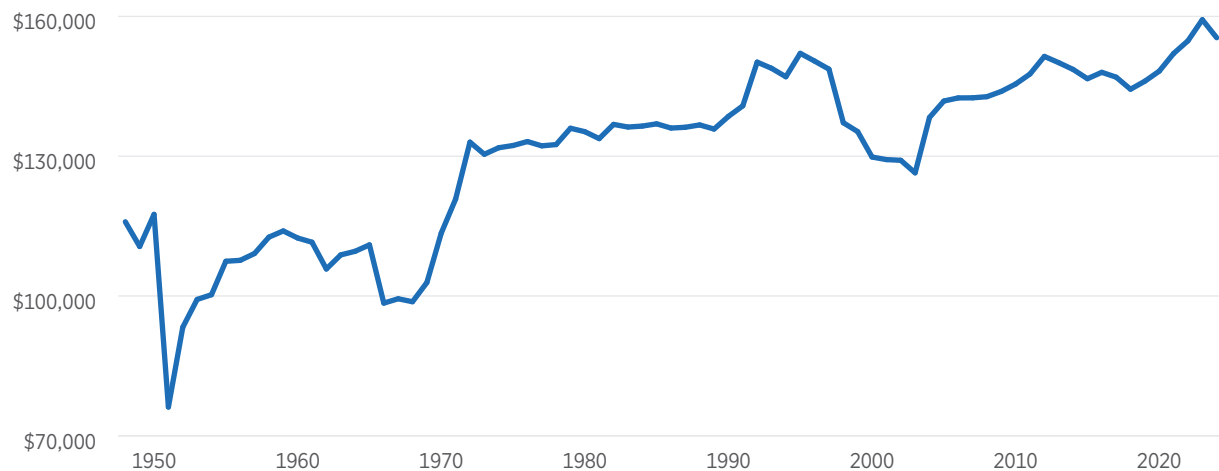
**SOURCE:** Office of Management and Budget, *Historical Tables*, "Table 8.4—Outlays by Budget Enforcement Act Category as Percentages of GDP: 1962–2028," <https://www.whitehouse.gov/omb/budget/historical-tables/> (accessed September 9, 2023).

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CHART 7

## Cost per Active Military Personnel

IN CONSTANT DOLLARS

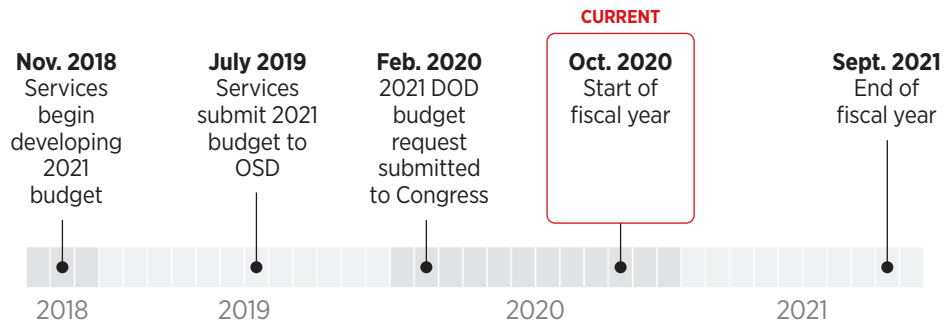


**SOURCE:** U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 9, 2023).

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FIGURE 1

## Development of Any DOD Budget Starts Two Years in Advance



**SOURCE:** Brendan W. McGarry, “Defense Primer: Planning, Programming, Budgeting and Execution (PPBE) Process,” Congressional Research Service *In Focus* No. IF10429, updated December 15, 2022, <https://fas.org/sgp/crs/natsec/IF10429.pdf> (accessed September 9, 2023).

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respect to what their organization provides them: An officer in 1970, for example, would have no expectation of having an individualized computer issued by the Army.

It should also be noted, however, that the peak level of resources available for operations and investments was between FY 2007 and FY 2011 when the country was heavily engaged both in two wars in the Middle East and in developing the new technology that was necessary to prosecute those conflicts.

When it comes to pay, the decrease in the size of the force has not been matched by a proportional decrease in the amount dedicated to pay. In other words, as a practical matter, the level of resources allocated per servicemember has increased over time. This reflects the amount that is spent on salaries and benefits as well as other services provided to servicemembers that are not funded with resources labeled as pay.

Chart 7 reflects the increased compensation that has been required to account for the compensation the military must offer to remain competitive with the private sector. As Americans generally and servicemembers in particular have become more educated and productive, especially with the consistent introduction of new technologies, they have commanded higher wages in the market, and this is reflected in the relative increase of pay within the DOD.

### The Defense Budget as Lagging Indicator

The defense budget is built through a unique process. The Department of Defense utilizes a

system called Planning, Programming, Budgeting and Execution (PPBE) to build and execute its budget. This system was developed in the 1960s and is showing some cracks.<sup>16</sup> The PPBE process defines how the DOD builds its budget and dictates the timelines for resourcing decisions. As illustrated by Figure 1, development of the services’ budgets starts at least two years before the fiscal year that they are intended to fund. This guarantees that the budget will present a projection of the future that is tied to past projections and assumptions. Thus, incorporation of a relevant innovation that was developed during the period between composition of the budget and the start of the fiscal year would be a notably challenging exercise.

Modifying resources that were programmed years in advance would be equally challenging because they represent real costs that would be incurred by a program or organization. Whether for good or ill, this makes the defense budget quite inflexible, and large movements of funds and changes in programming take several fiscal years to become fully apparent. It is common for new Administrations to say that it will take a few budget cycles to implement the changes desired at the Pentagon.<sup>17</sup> Thus, the defense budget will always be a lagging indicator of the ongoing challenges being faced by our military. The PPBE system makes budgetary decisions very “sticky” and is inherently biased toward maintaining the status quo.

Further, because the budget is about allocating taxpayers’ dollars, the decisions that are made both

inside and outside the department are ultimately political in nature. The final resolution of the defense budget rests with Congress, an inherently political body. However, politics also permeates the other levels of decisions involved in making the defense budget. The leaders who manage internal DOD programs will often base their actions on their expectation of what the services will do with their budget submissions, and the services will often base their actions on what they think the Office of the Secretary of Defense will do. In turn, the Secretary of Defense will anticipate and respond to the actions of the Office of Management and Budget, the President, and Congress. These interactions occur several times a day during all phases of the budget process.

There should always be continuous process improvement in the allocation of precious defense dollars. One such effort currently underway is the congressionally established Commission on Planning, Programming, Budgeting, and Execution

Reform (PPBE Commission). Established by the FY 2022 NDAA and composed of 14 commissioners appointed by congressional leaders and the Secretary of Defense,<sup>18</sup> it has conducted a variety of sessions to engage with the different individuals and organizations that participate in the PPBE process.<sup>19</sup> The commission is scheduled to submit its final report in March 2024.

## **Conclusion**

Regardless of the details and the process, determining the defense budget will necessarily be a political exercise that will have to take account of multiple divergent priorities and preferences. The political nature of such a determination makes it even more important that everyone involved has a clear understanding of the terms being discussed. After all, a 1.2 percent increase in the 050 line is very different from a 1.2 percent increase in the discretionary dollars controlled by the Department of Defense.

## Endnotes

1. Constitution of the United States, Preamble, <https://constitution.congress.gov/constitution/> (accessed August 10, 2023).
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3. Forrest McDonald, "Preamble," in *The Heritage Guide to the Constitution*, <https://www.heritage.org/constitution/#!/articles/0/essays/1/preamble>.
4. For a useful discussion of this question, see Brian Riedl, "What's Wrong with the Federal Budget Process?" Heritage Foundation *Backgrounder* No. 1816, January 25, 2005, <https://www.heritage.org/budget-and-spending/report/whats-wrong-the-federal-budget-process>.
5. The department lists seven categories of such activity: "(1) Naval reactors development; (2) Weapons activities, including defense inertial confinement fusion; (3) Verification and control technology; (4) Defense nuclear materials production; (5) Defense nuclear waste and materials by-products management; (6) Defense nuclear materials security and safeguards and security investigations; and (7) Defense research and development." See U.S. Department of Energy, Office of Management, Directives Program, "Atomic Energy Defense Activity," [https://www.directives.doe.gov/terms\\_definitions/atomic-energy-defense-activity#:~:text=Any%20activity%20of%20the%20Secretary%20performed%20in%20whole,%283%29C2%A0Verification%20and%20control%20technology%3B%20%284%29C2%A0Defense%20nuclear%20materials%20production%3B](https://www.directives.doe.gov/terms_definitions/atomic-energy-defense-activity#:~:text=Any%20activity%20of%20the%20Secretary%20performed%20in%20whole,%283%29C2%A0Verification%20and%20control%20technology%3B%20%284%29C2%A0Defense%20nuclear%20materials%20production%3B) (accessed August 11, 2023).
6. Once dollars are appropriated, federal agencies can start to spend them. Authorizations are not legally necessary, but they play an important role in budgeting because they authorize the existence of programs and organizations. For a discussion of unauthorized appropriations, see Justin Bogie, "Time to End 'Zombie' Appropriations," Heritage Foundation *Issue Brief* No. 4583, June 24, 2016, <https://www.heritage.org/budget-and-spending/report/time-end-zombie-appropriations>.
7. See, for example, The Heritage Foundation, *Budget Blueprint for Fiscal Year 2023*, 2022, <https://www.heritage.org/budget/>.
8. Natalie Sherman, "US Interest Rates Raised to Highest Level in 16 Years," *BBC News*, May 4, 2023, <https://www.bbc.com/news/business-65474456> (accessed August 10, 2023).
9. The dramatic spike in 2020 and 2021 followed by a decrease in 2022 is due to the federal government's increased expenditures during the coronavirus pandemic.
10. For the FY 2024 edition, see U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed August 10, 2023).
11. Reuters, "Pentagon Asks U.S. Forces Korea to Provide Equipment for Ukraine," January 19, 2023, <https://www.reuters.com/world/pentagon-asks-us-forces-south-korea-provide-equipment-ukraine-2023-01-19/> (accessed August 10, 2023).
12. See Bradley Penniston, "Explainer: What Is the Pentagon's Fourth Estate?" *Defense One*, updated May 12, 2021, <https://www.defenseone.com/threats/2020/02/what-pentagons-fourth-estate/162939/> (accessed August 11, 2023).
13. Frederico Bartels, "Carving Up the Defense Budget," *Daily Caller*, May 7, 2021, <https://dailycaller.com/2021/05/07/bartels-carving-up-defense-budget/> (accessed August 10, 2023).
14. Jared Serbu, DoD CMO Gains New Cachet as 'Secretary of the Fourth Estate,' Federal News Network, July 9, 2020, <https://federalnewsnetwork.com/on-dod/2020/07/dod-cmo-gains-new-cachet-as-secretary-of-the-fourth-estate/> (accessed August 10, 2023).
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16. Frederico Bartels, "Improving Defense Resourcing: Recommendations for the Commission on Planning, Programming, Budgeting, and Execution Reform," Heritage Foundation *Issue Brief* No. 5257, March 24, 2022, <https://www.heritage.org/defense/report/improving-defense-resourcing-recommendations-the-commission-planning-programming>.
17. A good example can be seen in Secretary of Defense Mark Esper's description of the first budget released during his tenure. See Aaron Mehta, "Mark Esper on the 'Big Pivot Point' that Will Define the 2022 Budget," *Defense News*, February 10, 2020, <https://www.defensenews.com/smr/federal-budget/2020/02/10/mark-esper-on-the-big-pivot-point-that-will-define-the-2022-budget/> (accessed August 10, 2023).
18. S. 1605, National Defense Authorization Act for Fiscal Year 2022, Public Law No. 117-81, December 27, 2021, Title X, Section 1004, <https://www.congress.gov/117/plaws/publ81/PLAW-117publ81.pdf> (accessed August 11, 2023).
19. See Appendix 1, "Commission on PPBE Reform Community Engagement," updated as of February 21, 2023, in Commission on Planning, Programming, Budgeting, and Execution Reform, *Status Update*, March 2023, <https://ppbereform.senate.gov/wp-content/uploads/2023/03/PPBE-REFORM-COMMISSION-STATUS-UPDATE-MAR-2023-Public.pdf> (accessed August 10, 2023).



# Global Operating Environment





# Assessing the Global Operating Environment

Aside from assessing a military force's equipment and the readiness of its people, measuring its strength—defined as the extent to which that force can accomplish missions—also requires examination of the environments in which the force operates. Aspects of one environment may facilitate military operations and present the U.S. military with obvious advantages; aspects of another may work against them and limit the effect of U.S. military power. The capabilities and assets of U.S. allies, the strength of foes, the willingness of friend or foe to use its military power, the region's geopolitical environment, and the availability of forward facilities and logistics infrastructure all factor into whether an operating environment is helpful when U.S. military forces must be called into action.

In any assessment of an operating environment, U.S. treaty obligations with countries in the region should always be a prime consideration. A treaty defense obligation ensures that the legal framework is in place for the U.S. to maintain and operate a military presence in a particular country. A treaty partnership usually yields regular training exercises and interoperability as well as political and economic ties. It also obligates the U.S. to commit its military in support of an ally, which has the effect of focusing U.S. military leadership on some regions more than others.

Other factors that affect an operating environment include the military capabilities of allies that might be useful to U.S. military operations; the degree to which the U.S. and allied militaries in the region are interoperable and can use, for example, common means of communication, weaponry, and other systems; and whether the U.S. maintains key bilateral alliances with nations in the region. Nations where the U.S. has stationed assets or permanent bases and countries from which the U.S. has launched military operations in the past could

provide needed support for future U.S. military operations. Additional criteria that should be considered include the quality of the local infrastructure, the area's political stability, whether or not a country is embroiled in any conflicts, and the degree to which a nation is economically free.

The relationships and knowledge gained through any of these factors would undoubtedly ease future U.S. military operations in a region and contribute greatly to a positive operating environment.

Then there are low-likelihood, high-consequence events that, although they occur infrequently, can radically alter conditions in ways that affect U.S. interests. Massive natural disasters like Typhoon Tip in 1979 or the explosion of Mount Tambora in 1816 can displace populations, upend regional power arrangements, or destroy critical infrastructure. The eruption of Mount Pinatubo in 1991, for example, caused so much damage to Clark Airbase and Subic Bay Naval Station that the cost, combined with diplomatic frictions between the U.S. and the Philippines, led the U.S. to abandon these strategic facilities. A massive solar flare could have a similar impact on a much larger scale because of the level of our dependence on electrical power. Scientists, analysts, planners, and officials in public and commercial ventures study such things but seldom take concrete action to mitigate their potential impact.

The COVID-19 pandemic that stretched from late 2019 to early 2023 is the most recent example of such a world-shaking event. It caused governments to spend extraordinary sums of money not only to manage the public health crisis, but also to mitigate the economic impact on their countries. Regardless of one's view with regard to its origin, its severity compared to other diseases, or how it was handled, the economic and societal stresses stemming from the pandemic put terrific pressures on

political establishments. They also caused funding for such essential government functions as defense to be reallocated to meet the more immediate demands of the pandemic and—given the threat of contagion—mitigation measures to be adopted at the expense of military exercises, training events, and deployments.

As of mid-2023, nearly all countries appear to have resolved many of the disruptions caused by the pandemic, adapting their economies and adjusting their policy approaches to deal with the public health crisis. So, too, did populations normalize their routines, mitigating many of the original fears stemming from the crisis. In similar fashion, military forces found ways to return to the training and exercises that are necessary to regain proficiency.

Russia's invasion of Ukraine in February 2022 and the war that has continued since then have affected national and public perspectives with regard to military power. Before Russia invaded its neighbor, many capitals acknowledged the importance of military power but often failed to follow their words with commensurate investments in operationally relevant military forces. Confronted with the reality of a war in Europe and the possibility of another one in Asia because of China's persistent saber rattling and heavy investment in its ability to project

power, Poland, Germany, Great Britain, and Japan (to name but a few) have substantially increased their defense budgets and, among European allies, have contributed equipment, munitions, and a range of supplies to Ukraine to help it defend itself.

One consequence of this has been reinvigorated discussions among U.S. allies about the status of military power and the need to ensure that forces can work together effectively. But another has been the consumption of expensive military capabilities, which has led some countries to start hedging on their pledges to sustain support to Ukraine or, in some circumstances, to contribute national power to collective defense.

All of this to say that conditions evolve from one year to the next and from one security setting to the next in ways that affect the ease or difficulty of conducting U.S. military operations. Our assessment of the operating environment is meant to add critical context to complement the threat environment and U.S. military assessments that are detailed each year in the *Index of U.S. Military Strength*.

A final note: The names of all disputed territories mentioned in this *Index* are the names used by the U.S. Department of State. The reader should not construe this as reflecting a position on any of these disputes.

# Europe

Daniel Kochis

The scale, scope, and intensity of Russia's war on Ukraine have exposed the inadequacy of allied capabilities, munitions stocks, and force posture in Europe, especially in Eastern Europe, while underscoring the need for updated regional defense plans. The U.S. has reintroduced additional manpower and capabilities into Europe since February 2022 and has built a significant footprint in places like Poland and Romania. European North Atlantic Treaty Organization (NATO) allies have deployed in support of alliance deterrence efforts in eastern Europe, and many have renewed their commitment to NATO spending benchmarks and rebuilding military capabilities that have atrophied over the past 30 years. Some members—Lithuania, Poland, Estonia, and Greece, in particular—have made dramatic increases in defense spending while others—Germany, France, Spain, Norway, and Belgium, as examples—have not, in spite of pledges to do better. Still, NATO, as a whole, has demonstrated an upward trend in investing in defense, outpacing the United States in aggregate terms by nearly three-to-one over the past decade in constant 2014 dollars. To be clear, some of the largest improvements as a percentage of GDP or percentage change from one year to the next have been among smaller countries who, because of their size and the amount of money they are able to spend, cannot translate a specific increase into quantity-of-capability when it comes to armored forces, squadrons of tactical aircraft, or naval battle groups. Europe's security condition, and with it the security of U.S. interests, would be materially improved if the larger countries spent more on collective defense capabilities. Still, European NATO partners have been improving their investments, albeit at a slower pace than is needed given the depths to which defense capabilities

and readiness have fallen since the end of the Cold War.<sup>1</sup> Interestingly, it appears that the farther away a NATO country is from Russia, the less it tends to spend on defense, implying proximity to perceived danger strongly influences such spending. The Baltic countries, Poland, and NATO members in Eastern Europe spend more on defense than those in Western and Southern Europe.<sup>2</sup>

In June 2022, NATO adopted its first new Strategic Concept in 12 years. The new concept document takes into account the comprehensive changes in the transatlantic security environment that have taken place in the past 12 years and clearly recognizes the growing threat posed by the Russia–China axis:

The Russian Federation is the most significant and direct threat to Allies' security and to peace and stability in the Euro-Atlantic area. It seeks to establish spheres of influence and direct control through coercion, subversion, aggression and annexation. It uses conventional, cyber and hybrid means against us and our partners. Its coercive military posture, rhetoric and proven willingness to use force to pursue its political goals undermine the rules-based international order.<sup>3</sup>

The People's Republic of China's (PRC) stated ambitions and coercive policies challenge our interests, security and values.... The PRC's malicious hybrid and cyber operations and its confrontational rhetoric and disinformation target Allies and harm Alliance security. The PRC seeks to control key technological and industrial sectors, critical infrastructure, and strategic materials and supply chains. It uses

its economic leverage to create strategic dependencies and enhance its influence. It strives to subvert the rules-based international order, including in the space, cyber and maritime domains. The deepening strategic partnership between the People's Republic of China and the Russian Federation and their mutually reinforcing attempts to undercut the rules-based international order run counter to our values and interests.<sup>4</sup>

NATO welcomed Finland as its 31st member state in April 2023<sup>5</sup> and is expected to welcome Sweden eventually as well.<sup>6</sup> The alliance is updating regional defense plans, is transitioning to a new force structure, and has taken some steps to bolster deterrence through a stronger, more persistent presence in eastern member states. The ability of the alliance to implement recent decisions, flesh out plans for expanded multinational deployments, and fulfill larger requirements for ready forces remains to be seen.

The U.S. and its allies also have made significant investments in arming and training the Ukrainian military. What began as individual nations supplying arms, ammunition, and supplies (often surplus) has evolved into a sustained flow of intelligence, weapons, matériel, and platforms upon which Ukrainian forces have become entirely reliant. Many supporting countries are repairing damaged Ukrainian equipment; some are aiding Ukraine with niche capabilities. While the U.S. remains the largest donor to Ukraine, many European nations are donating significant capabilities, particularly ammunition, armored vehicles, communications equipment, and medical supplies. European nations also have accepted millions of Ukrainian refugees fleeing the war.<sup>7</sup>

All of this reflects a grim reality: War is still a feature of international relations that cannot be predicted or always deterred. War is costly, both in preparation and in undertaking, and also generates additional costs (such as support for refugees and disruption of economic activity) beyond the straightforward expense of equipment and training.

The 51 countries in the U.S. European Command (USEUCOM) area of responsibility (AOR) include approximately one-fifth of the world's population, 10.7 million square miles of land, and 13 million square miles of ocean. Some of America's oldest

(France) and closest (the United Kingdom) allies are found in Europe. The U.S. and Europe share a strong commitment to the rule of law, human rights, free markets, and democracy. During the 20th century, millions of Americans fought alongside European allies to defend these shared ideals—the foundations on which America was built.

America's economic ties to the region are likewise important. For more than 70 years, the U.S. military presence has contributed to regional security and stability, and both Europeans and Americans have benefited economically. The member states of the European Union (EU), along with the United States, account for approximately half of the global economy, and the U.S. and EU member countries are generally each other's principal trading partners.

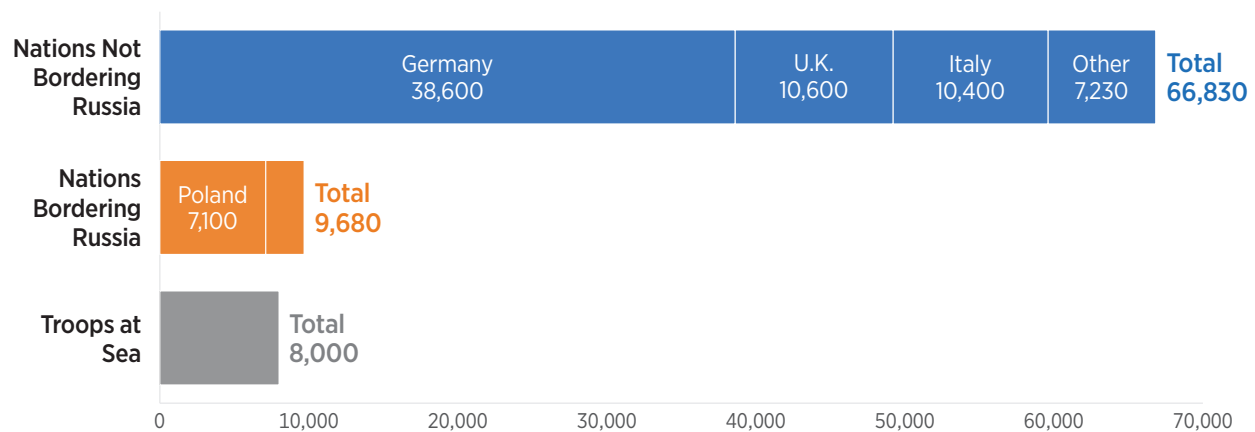
Europe is also important to the U.S. because of its geographical proximity to some of the world's most dangerous and contested regions. From the eastern Atlantic Ocean to the Middle East, up to the Caucasus through Russia, and into the Arctic, Europe is enveloped by an arc of instability. The European region also has some of the world's most vital shipping lanes, energy resources, and trade choke points.

European basing allows U.S. forces to respond robustly and quickly to challenges to America's economic and security interests in and near the region. Russia's brutal effort to remake the borders of Europe by force has shocked many partners, upended the continent's strategic picture, and caused a war with implications that are far wider than the sovereignty of Ukraine itself. Admiral Robert Burke, former Commander of U.S. Naval Forces Europe, U.S. Naval Forces Africa, and Allied Joint Forces Command Naples, has described the European and African theaters as "the forefront of great power competition."<sup>8</sup>

Other external threats to European security include Russia's activity in the Arctic, growing presence in the Mediterranean theater, and efforts to destabilize Western cohesion in addition to the possibility that Russia might expand the scope of its aggression to include the eastern states of NATO. Added to this is the growing threat to the transatlantic alliance from Chinese investments, technology, and propaganda efforts. Russian naval activity in the North Atlantic and Arctic has led to a renewed focus on regional command and control and increased operations by U.S. and allied air and

CHART 8

## Few U.S. Troops in Europe Are Stationed Near Russia



**NOTE:** Data for countries with fewer than 100 troops are excluded.

**SOURCE:** U.S. European Command, written response to Heritage Foundation request for information on U.S. troop levels in Europe, July 21, 2023.

heritage.org

naval assets in the Arctic, and one consequence of Russia's strengthened position in Syria has been a resurgence of Russian activity and "congested" conditions in the Mediterranean.<sup>9</sup>

Speaking at an Atlantic Council meeting in March 2019, former U.S. Joint Chiefs of Staff Chairman General Joseph Dunford explained that the U.S. has two key advantages over adversaries: "our network of allies and partners, and the ability to project power where and when necessary to advance our national interest."<sup>10</sup> Nowhere is the value of allies and U.S. basing more apparent than it is in the European operating environment.

**U.S. Reinforcements in Europe.** Russia's war against Ukraine greatly accelerated a trend of U.S. reinvestment in Europe that had begun following Russia's initial invasion of Ukraine in 2014. In April 2014, the U.S. launched Operation Atlantic Resolve (OAR), a series of actions meant to reassure U.S. allies in Europe, particularly those bordering Russia. Under Operation Atlantic Resolve and funded through the European Deterrence Initiative (EDI), the U.S. increased its forward presence in Europe; invested in European basing infrastructure and prepositioned stocks, equipment, and supplies; engaged in enhanced multinational training exercises; and negotiated agreements for increased cooperation with NATO allies.

The U.S. currently has about 100,000 troops stationed in Europe.<sup>11</sup> In response to Russia's invasion of Ukraine, the U.S. increased the flow of forces to Europe, and the U.S. and NATO undertook a reevaluation of long-term basing structures and force posture requirements with a view to preventing Russian aggression from spilling over into alliance member states, especially those like Poland, whose role as a staging ground for aid to Ukrainian forces has made it a Russian target.

In March 2023, the U.S. presence in Poznan, Poland, transitioned to Army Garrison Poland (US-AG-P), the eighth permanent U.S. Army garrison in Europe.<sup>12</sup> Overall, the U.S. has a presence of around 12,000 in Poland.<sup>13</sup> The Army's V Corps, which had been deactivated in 2013, was reactivated on November 9, 2020, and became fully operational in November 2021.<sup>14</sup> In March 2022, the headquarters, then based in Kentucky, was largely deployed to Europe "to provide additional command and control of U.S. Army forces in Europe" and "to build readiness, improve interoperability, reinforce allies and deter further Russian aggression."<sup>15</sup> In June 2022, President Biden announced that the U.S. would establish the permanent V Corps headquarters in Poland.<sup>16</sup> According to General Christopher Cavoli, Supreme Allied Commander Europe (SACEUR) and Commander, U.S. European Command, "permanently

assigned forces are more operationally effective, as they remain fully oriented to the operational environment and can become interoperable with our Allies and Partners.”<sup>17</sup>

During the June 2022 NATO Summit in Madrid, the U.S. announced additional deployments to Europe including the deployment of a new rotational brigade combat team to Romania. Today, around 4,000 U.S. troops, largely based at the Mihail Kogalniceanu Air Base, help to train “soldiers from NATO allies in Bulgaria, Germany, Hungary and Slovakia.”<sup>18</sup> The deployment has been extended through at least the end of 2023 with a new rotation of troops from Kentucky to be joined by a two-star general and staff from Fort Drum, New York. Analysts have noted that having a major general in Romania “that close to the combat zone...would allow for quick decisions about where to position troops and weapons should Russia push the war into NATO territory.”<sup>19</sup> Additional contributions to European security announced in June 2022 include (among others listed) enhanced rotational deployments of “armored, aviation, air defense, and special operations forces” to the Baltics; an “air defense artillery brigade headquarters, a short-range air defense battalion, a combat sustainment support battalion headquarters, and an engineer brigade headquarters” forward stationed in Germany; a “a short-range air defense battery” forward stationed in Italy.<sup>20</sup>

The U.S. has further strengthened its presence in Norway. The Supplementary Defense Cooperation Agreement signed by the two nations in April 2021 and approved by the Norwegian parliament in June 2022 allows the U.S. to build additional infrastructure at Rygge and Sola Air Stations in southern Norway as well as Evenes Air Station and Ramsund Naval Station above the Arctic Circle.<sup>21</sup> Construction at Evenes will support the monitoring of Russian submarine activity by Norwegian and allied maritime patrol aircraft. According to former Norwegian Foreign Minister Ine Eriksen Soereide, “The agreement reaffirms Norway’s close relationship with the U.S. and confirms Norway’s key position on the northern flank of NATO.”<sup>22</sup>

In October 2021, the U.S. Navy deployed a mobile “Expeditionary Medical Facility to a cave system near Bogen Bay in northern Norway, some 100 miles north of the Arctic Circle.”<sup>23</sup> According to the operations director for the U.S. Navy Expeditionary Medical Support Command (NEMSCOM),

“Expeditionary Medical Facilities are deployable on short notice and contain many capabilities of a modern hospital.”<sup>24</sup> In October 2020, at the behest of the United States, Norway announced the reopening of Olavsvern bunker, a mountainside submarine base near Tromsø with “32,000 square feet of deep-water docking space, including a full dry dock for maintenance,” capable of berthing and refitting American submarines. The base, which had been closed in 2002, is now open to U.S. *Seawolf*-class nuclear submarines.<sup>25</sup>

In August 2020, the Marine Corps announced the end of heel-to-toe rotations of 700 Marines to Norway, which began in 2017, opting for shorter, more sporadic deployments like those that occurred in 2021 and 2022 when U.S. Marines worked with Norwegian forces and utilized Norway’s ample training ranges.<sup>26</sup> In February and March 2021, four B-1 Lancers were based out of Ørland Air Station in southern Norway, marking the first time the aircraft have been based in that country.<sup>27</sup> The Lancers conducted training exercises with allies Denmark, Germany, Italy, Norway, and Poland while also practicing landing and refueling at Bodø Air Base above the Arctic Circle.<sup>28</sup>

From March–April 2022, Norway hosted NATO’s Cold Response 2022, at that time the largest Norwegian-led exercise since the Cold War. Among the participants were 3,000 American Marines.<sup>29</sup> In February and March 2023, U.S. forces took part in Arctic Forge 23, “an exercise that includes Finland’s Defense Exercise North, and exercise Joint Viking in Norway.”<sup>30</sup> The U.S. contributed approximately 930 Marines and Army personnel to Joint Viking and 280 Army personnel to Defense Exercise North, and II Marine Expeditionary Force Commanding General David A. Ottignon assessed that the exercises made U.S. forces “more survivable and lethal in austere environments.”<sup>31</sup> Finland, Sweden, and Norway reportedly are planning a joint exercise, Nordic Response 2024, that as currently planned would be the largest NATO exercise in the Arctic since the end of the Cold War.<sup>32</sup>

In February 2023, the 2nd Armored Brigade Combat Team (ABCT) of the 1st Cavalry Division from Fort Hood, Texas, replaced the outgoing BCT in the tenth armored rotation in support of OAR.<sup>33</sup> Many analysts have noted the special deterrent importance of ground forces. “Land forces provide traditional ‘boots on the ground’ and a visible presence

among local populations,” according to one recent analysis. “They can also enhance the credibility of deterrence through bringing to bear the heavy ground forces required to defend, seize, and hold territory in the event of conflict.”<sup>34</sup>

In addition to back-to-back rotations of armor, the U.S. has maintained a rotational aviation brigade in Europe since February 2017.<sup>35</sup> The ninth such rotation, lasting from August 2022–April 2023, is the 1st Armored Division, Combat Aviation Brigade, from Fort Bliss, Texas, with 2,300 troops, 10 CH-47 Chinooks, 25 AH-64 Apaches, and 40 UH-60 and 15 HH-60 Black Hawk helicopters.<sup>36</sup> The tenth rotation will be carried out by the 3rd Combat Aviation Brigade, 3rd Infantry Division, from Fort Stewart, Georgia, from May 2023–February 2024.<sup>37</sup>

The U.S. also continues to rotate a Sustainment Task Force “comprised of nearly 1,000 personnel and 200 pieces of equipment” from “11 active duty, U.S. Army Reserve and National Guard units.” The units that make up the task force “include ammunition, fuel, movement control, transportation, maintenance, ordnance, supply, and postal services.”<sup>38</sup>

In May 2018, the U.S. began to fly MQ-9 Reaper drones on unarmed reconnaissance flights out of Miroslawiec Air Base in Poland, which U.S. Air Force (USAF) officials stated was chosen because of its “strategic location.”<sup>39</sup> In January 2021, the U.S. announced that 90 USAF personnel and an unspecified number of MQ-9s would be based at Campia Turzii in Romania “to conduct intelligence, surveillance and reconnaissance missions in support of NATO operations.”<sup>40</sup> According to General Jeffrey Harrigian, then Commander, U.S. Air Forces in Europe, U.S. Air Forces Africa, and Allied Air Command, the base’s location approximately 300 miles from the coast “really facilitates our ability to compete in the Black Sea.”<sup>41</sup> In late 2022, the U.S. began to deploy MQ-9s from Larissa Air Base in Greece near the Aegean Sea,<sup>42</sup> “a strategic location, allowing the MQ-9s to easily support both the eastern and southern flanks of NATO.”<sup>43</sup> The U.S. also operates MQ-9s out of Lask Air Base in Poland.<sup>44</sup>

In April 2022, it was reported that the USAF had “moved additional fighters, tankers, and intelligence, surveillance, and reconnaissance aircraft into the European theater over the past few months, as well as bombers on a rotational basis, all to reassure NATO allies who feel threatened by the invasion of Ukraine.”<sup>45</sup>

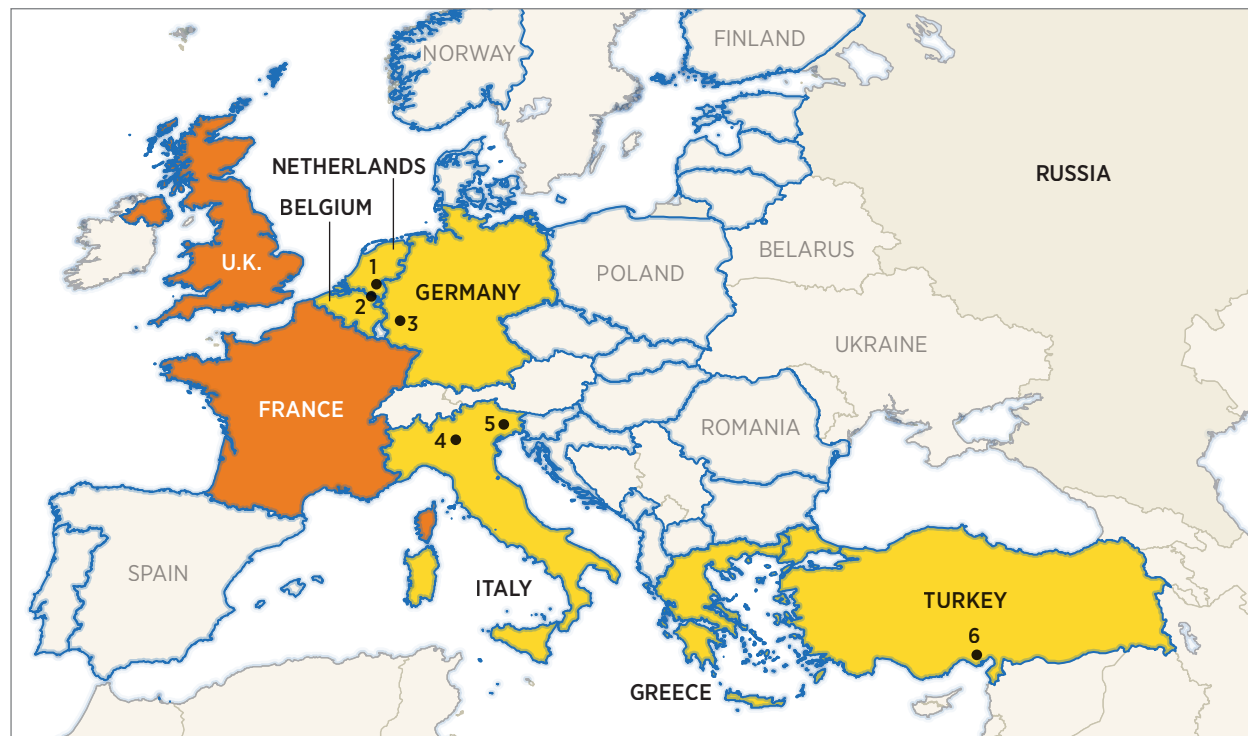
In January 2022, as part of the ongoing U.S. commitment to NATO’s Baltic Air Policing, six F-15Es based in North Carolina deployed to Ämari Air Base in Estonia.<sup>46</sup> That same month, U.S. F-16s based in Germany deployed to Poland to fly regional air policing missions. The day after Russia’s full-scale invasion of Ukraine in February 2022, six Utah-based F-35As forward deployed to Spangdahlem Air Base in Germany, periodically taking part in Baltic Air Policing missions out of Estonia and Lithuania.<sup>47</sup> In May 2022, eight F-35As from the Vermont National Guard deployed to Spangdahlem to take part in NATO’s enhanced Air Policing (eAP) mission.<sup>48</sup> From August–November 2022, F22s based in Alaska and F-15E Strike Eagles based in RAF Lakenheath in the United Kingdom (U.K.), took part in air policing flying out of Poland.<sup>49</sup>

U.S. B-52H Stratofortresses based in North Dakota have periodically deployed to the European theater. In August 2022, B-52s deployed to RAF Fairford, U.K., for exercises in which “U.S., Norway and Sweden military aircraft...executed rapid, global power projection missions to support the mutual defense of NATO partners and Allies, all while achieving multi-domain effects.”<sup>50</sup> In February 2023, two B52s conducted a low approach flyby of Estonia’s Independence Day celebrations in Tallinn having flown from North Dakota.<sup>51</sup>

*European Deterrence Initiative.* Some U.S. investments in Europe including rotations of Armored and Aviation Brigade Combat Teams are funded through the European Deterrence Initiative (EDI). The Biden Administration has requested \$3,630.4 million for the EDI in fiscal year (FY) 2024, which is \$637 million (15 percent) less than the enacted FY 2023 EDI budget of \$4,267.4 million.<sup>52</sup> EDI funding requests for FY 2024 include support for such activities as “rotational force deployments, infrastructure investments, and [delivery of] the right capabilities in key locations throughout Europe”;<sup>53</sup> intelligence enhancements for special operations forces;<sup>54</sup> exercises to “increase[] the overall readiness and interoperability of U.S. forces across all domain[s]” and “with our NATO Allies and theater partners”;<sup>55</sup> “facilities to store prepositioned equipment, munitions and fuel”;<sup>56</sup> and modernization of “CBRN [Chemical, Biological, Radiological, and Nuclear] defenses to ensure forces are prepared to [defend] against rising threats in the AOR.”<sup>57</sup>

## Overview of NATO’s Nuclear Deterrence

■ NATO members    
 ■ NATO members in Europe with nuclear weapons    
 ■ Countries with nuclear-sharing agreement to carry U.S. nuclear weapons on aircraft



**U.S. tactical nuclear weapons storage sites in Europe**

- |                                |                             |
|--------------------------------|-----------------------------|
| 1 Volkel Air Base, Netherlands | 4 Ghedi Air Base, Italy     |
| 2 Kleine Brogel, Belgium       | 5 Aviano Air Base, Italy    |
| 3 Büchel Air Base, Germany     | 6 Incirlik Air Base, Turkey |

**NOTES:** There is conflicting information regarding whether the nuclear-sharing agreement with Turkey remains in force. In 2022, Poland raised the possibility of taking part in nuclear sharing in the future.

**SOURCES:** Center for Arms Control and Non-Proliferation, “Fact Sheet: U.S. Nuclear Weapons in Europe,” August 18, 2021, <https://armscontrolcenter.org/fact-sheet-u-s-nuclear-weapons-in-europe/> (accessed September 9, 2023), and Hans Kristensen, “NATO Steadfast Noon Exercise and Nuclear Modernization in Europe,” Federation of American Scientists, October 17, 2022, <https://fas.org/publication/steadfast-noon-exercise-and-nuclear-modernization/> (accessed September 9, 2023).

The EDI has supported infrastructure improvements across the region. One major EDI-funded project is a replacement hospital at Landstuhl, Germany, that will “provid[e] primary care, specialized consultative care, hospitalization and treatment for more than 200,000 U.S. military personnel, DoD and interagency civilians and dependents in Europe.”<sup>58</sup> Landstuhl’s importance is illustrated by

the fact that in early March 2020, it was one of the first two overseas U.S. laboratories to be capable of testing for coronavirus.<sup>59</sup>

In addition to the EDI, as of the end of 2021, the U.S. Department of State had awarded nearly \$300 million in grants since 2018 through its European Recapitalization Incentive Program (ERIP) and repurposed funds to help U.S. allies



in Europe replace Russian equipment with U.S.-made equipment: infantry fighting vehicles for Croatia, Greece, and North Macedonia; helicopters for Albania, Bosnia and Herzegovina, Lithuania, and Slovakia; and air surveillance radars and fixed-wing aircraft for Bulgaria. The program helps allies to “modernize their militaries by building NATO interoperable forces and removing Russian and Soviet-legacy equipment from their force structure.”<sup>60</sup>

*Prepositioned Stocks.* The U.S. continues to preposition equipment in Europe across all services. In February 2022, the U.S. activated six Army Prepositioned Stock-2 sites to outfit an Armored Brigade Combat Team deploying from the U.S.<sup>61</sup> The FY 2024 EDI budget request includes \$1,246.2 million to support enhanced prepositioning for the U.S. Army, Air Force, and Special Forces.<sup>62</sup> The U.S. Army lists storage sites in Dülmen, Germany; Eyselshoven, the Netherlands; Zutendaal, Belgium; Livorno, Italy; Mannheim, Germany; and Powidz, Poland.<sup>63</sup> The Powidz site opened on April 5, 2023.<sup>64</sup>

In March 2022, NATO opened its first Multinational Ammunition Warehousing Initiative (MAWI) in Estonia for allies to store munitions for Enhanced Forward Presence (EFP) deployments. The alliance plans further MAWI sites to support EFP deployments and the Very High Readiness Joint Task Force (VJTF).<sup>65</sup> “With Russia’s brutal war against Ukraine,” NATO’s Assistant Secretary General for Defence Investment has stated, “MAWI has gained significant relevance beyond efficiency improvements only. The expansion of NATO’s multinational battlegroups on the eastern flank requires an upgrade of the logistical support infrastructure to match this scope.”<sup>66</sup>

**Aid to Ukraine.** According to the U.S. Department of State:

Since January 2021, the United States has invested more than \$42 billion in security assistance to demonstrate our enduring and steadfast commitment to Ukraine’s sovereignty and territorial integrity. This includes more than \$41.3 billion since Russia’s [sic] launched its premeditated, unprovoked, and brutal war against Ukraine on February 24, 2022. Since 2014, the United States has provided more than \$44.1 billion in security assistance for

training and equipment to help Ukraine preserve its territorial integrity, secure its borders, and improve interoperability with NATO.<sup>67</sup>

The U.S. is by far the largest donor to Ukraine. According to the Kiel Institute for the World Economy’s Ukraine Support Tracker, the top six donors of total financial, humanitarian, and military assistance from January 24, 2022, to January 15, 2023, were the United States, “EU Institutions,” the United Kingdom, Germany, Canada, and Poland.<sup>68</sup> European Union aid is heavily weighted toward financial support in the form of loans.<sup>69</sup> When aid is calculated as a percentage of gross domestic product (GDP), however, “[t]he United States comes in 5th, with total commitments worth around 0.37 percent of its 2021 GDP,” behind Estonia, Latvia, Lithuania, and Poland.<sup>70</sup>

In January 2023, Germany announced that it would be donating at least 14 Leopard 2A6 tanks to Ukraine.<sup>71</sup> The first eight arrived in March. Germany also sent “two specialist tank-recovery vehicles and 40 Marder infantry fighting vehicles.”<sup>72</sup> In February, Poland became the first nation to deliver tanks (the first four of a total of 14 Leopard 2A4s eventually delivered).<sup>73</sup> In March, the U.S. announced that it would send an older Abrams tank version, the M-1A1, rather than the M-1A2 originally planned in order to advance delivery to early fall 2023. The U.S. is planning to outfit a complete tank battalion with 31 of the M-1A1s, which U.S. Secretary of Defense Lloyd Austin has said would “make a pretty significant difference” for Ukrainian operations.<sup>74</sup>

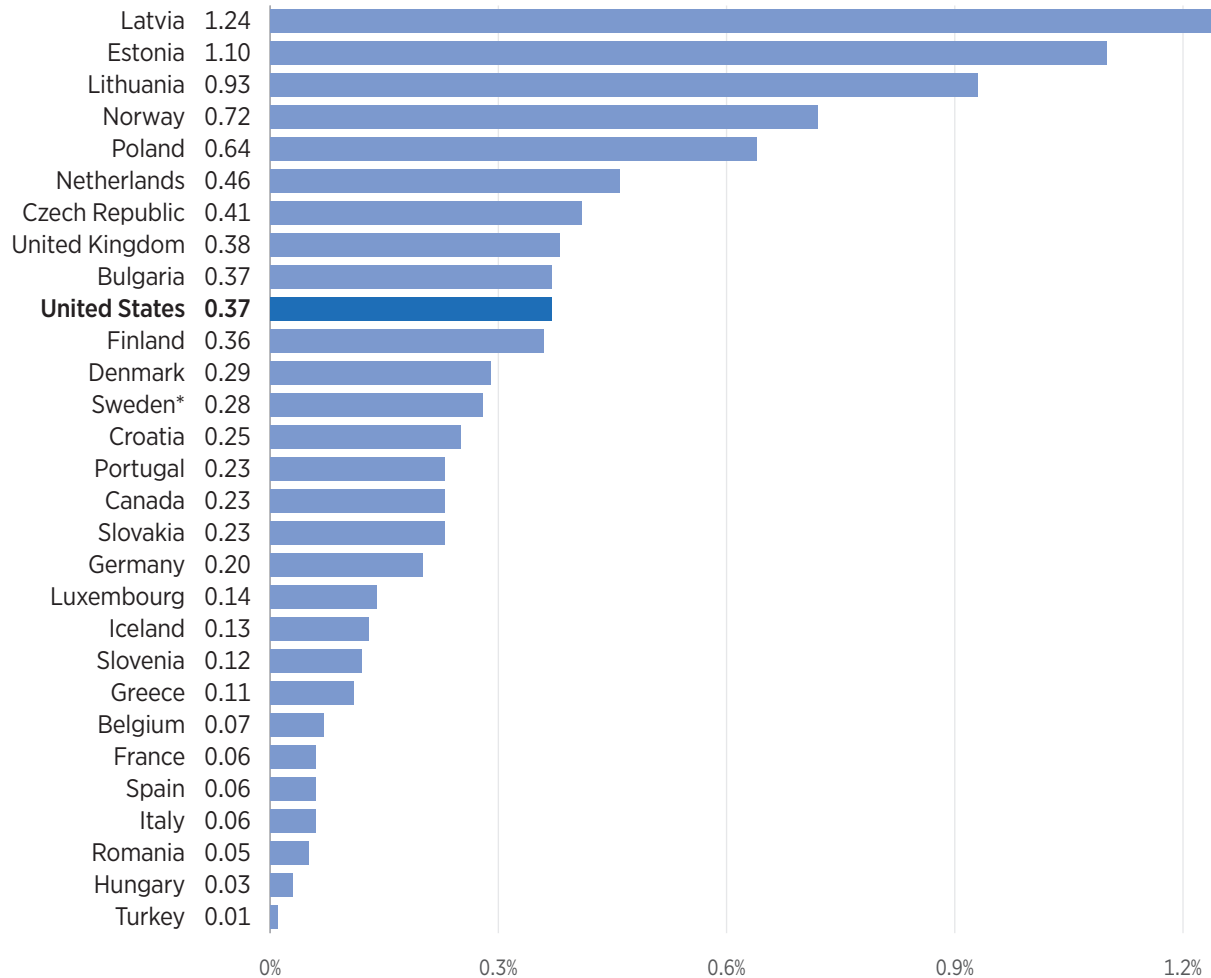
In March 2023, Norway announced that it had delivered eight Leopard 2A4 tanks to Ukraine.<sup>75</sup> Also in March, the United Kingdom delivered “14 UK Challenger tanks” along with “20 Bulldog armoured troop carriers and 30 AS-90 self-propelled artillery guns.”<sup>76</sup> Canada sent four Leopard 2 tanks at the end of February, Spain sent six Leopard 2A4 tanks at the end of April,<sup>77</sup> Finland announced at the end of March that it would soon be sending three Leopard 2 armored mine-clearing vehicles, and Sweden promised in February to “donate up to 10 Leopard 2 tanks.”<sup>78</sup>

In addition to the Abrams, U.S. aid includes such support as ammunition, anti-tank weapons, 20 Mi-17 helicopters, 154 Bradley Infantry Fighting Vehicles, Switchblade Unmanned Aerial Systems,

## NATO Aid to Ukraine

Shown below are figures for total military, financial, and humanitarian aid to Ukraine since January 24, 2022, by current and pending members of NATO.

TOTAL BILATERAL COMMITMENTS AS PERCENTAGE OF GDP



\* NATO membership pending.

**NOTE:** Data for Albania, Montenegro, and North Macedonia are not available.

**SOURCE:** Data from Kiel Institute for the World Economy, "Ukraine Support Tracker," <https://www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/> (accessed September 9, 2023).

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and air defenses including one Patriot battery and eight National Advanced Surface-to-Air Missile Systems (NASAMS) and munitions.<sup>79</sup> Air defenses are a priority for Ukraine. Germany and the Netherlands have stated their intention to donate Patriot missile batteries, and France and Italy have donated SAMP/T Medium Range Air Defense Systems.<sup>80</sup>

Germany has sent two advanced air defense batteries to Ukraine that had been stationed to protect Berlin from incoming missiles.<sup>81</sup>

Leaked U.S. Pentagon documents reportedly reveal concerns that Ukrainian air defense ammunition might be used at a high rate of expenditure as well as concerns about the need for a greater

quantity of air defense systems. “While the Patriots and SAMP-T are more sophisticated than S-300,” according to the documents, “the three batteries due to arrive in Ukraine won’t be able to replace the breadth of coverage afforded by the 25 currently operating Ukrainian S-300 batteries.”<sup>82</sup> The West’s ability to provide munitions without a major increase in production has further revealed the limitations of the Western defense industrial base. According to the Royal United Services Institute, for example, “At the height of the fighting in eastern Ukraine’s Donbas area, Russia was using more ammunition in two days than the entire stock of the British military.”<sup>83</sup>

Fighter jets also have begun to arrive in Ukraine. By April 17, Slovakia had delivered all 13 promised MiG-29s.<sup>84</sup> The first Slovakian-donated MiGs saw combat by the end of March.<sup>85</sup> Slovakia made known that Russian technicians helping to maintain the MiGs until the end of 2022 had sabotaged the jets. Slovakian Defense Minister Jaroslav Nad stated that before being fixed, the jets “were able to fly, but that doesn’t mean they were also capable of combat.”<sup>86</sup> In April, Poland sent the first five MiG29s to Ukraine, having received export approval from Germany pursuant to the terms of a 2003 purchase agreement.<sup>87</sup>

Many European nations have depleted their own stocks to equip Ukrainian forces. For instance, in addition to Harpoon anti-ship missiles, Denmark is donating all of its 19 Caesar self-propelled howitzers, some of which have been ordered by the Danes but have yet to arrive.<sup>88</sup> In 2022, Estonia and Latvia donated one-third of their defense budgets to Ukraine.<sup>89</sup> The expenditure rate of munitions on the battlefield, combined with Western industry’s lack of preparedness for a prolonged war, has Western officials concerned about their ability to maintain the flow of essential capabilities to Ukraine. In November 2022, one NATO official commented, “I think everyone is now sufficiently worried.”<sup>90</sup>

NATO allies continue to train Ukrainian forces, sometimes on specific systems. The U.S. trained 7,000 Ukrainian soldiers between February 2022 and March 2023.<sup>91</sup> Some have traveled to the U.S. for training on systems such as Patriot; others have taken part in combined arms, medical training, and combat casualty care at U.S. bases in Germany. With support from Australia, Canada, Denmark, Finland, Lithuania, the Netherlands, New Zealand, Norway,

and Sweden, the U.K.’s Operation Interflex trained 10,000 Ukrainian troops from June–December 2022 and plans to train 20,000 in 2023.<sup>92</sup> In early 2023, the U.K. trained Ukrainian tank crews on the Challenger II tank at British bases.<sup>93</sup> Germany is heading an EU mission to train 9,000 Ukrainian troops in Germany in 2023 with a goal of eventually training 30,000; the Netherlands and Norway are contributing to this training mission.<sup>94</sup> The Czech Republic, France, Italy, Romania, Slovakia, and Spain are also training Ukrainian troops.<sup>95</sup>

NATO allies are helping Ukraine to repair and maintain equipment. U.S. forces are helping Ukrainians to troubleshoot equipment issues over the phone or via video link, at times while the capability in question is engaged in battle.<sup>96</sup> Poland maintains a large facility with 400 personnel to repair Ukrainian armor and artillery.<sup>97</sup> In April 2023, Poland opened another facility, Bumar-Labędy, to repair and maintain donated T-72 and PT-91 main battle tanks (MBTs) and possibly Leopard IIs.<sup>98</sup> U.S. Abrams tanks will reportedly be repaired in Poznan, Poland, where U.S. personnel are said to be assisting.<sup>99</sup> In April 2023, Germany’s Rheinmetall opened a maintenance facility near Satu Mare, Romania, with the ability to service Leopard IIs, “self-propelled howitzers, Marder infantry fighting vehicles, Fuchs armored transport vehicles, and military trucks.”<sup>100</sup> Bulgarian factories have repaired Ukrainian equipment including helicopters.<sup>101</sup> In February 2023, Ukrainian “weapons and military hardware manufacturer Ukroboronprom...signed a memorandum with the Czech Republic’s VOP CZ military enterprise on repairing Ukrainian armored vehicles.” The memorandum is part of a 2022 deal “to create joint enterprises to increase military equipment production for Ukraine.”<sup>102</sup>

Other nations have assisted Ukraine with niche capabilities. Estonia, for example, led an EU-funded program to help strengthen Ukraine’s cyber capabilities and in 2022 helped Ukraine’s military to set up a cyber facility.<sup>103</sup> Also in 2022, the European Union began to reimburse member states for a portion of weapons sent to Ukraine through its European Peace Facility (EPF). In March 2023, the European Council agreed to spend \$1.1 billion from the EPF to reimburse ammunition donations from the existing stocks of member states. An additional €1 billion will be drawn to fund “joint procurements through the European Defense Agency and will

place new orders at the European defense industry to speed up production to replenish stockpiles.”<sup>104</sup>

The transatlantic community has also accepted large numbers of Ukrainian refugees fleeing the war. Since February 24, 2022, 10.7 million Ukrainian refugees have crossed the border into Poland, and more than 1.5 million have elected to remain rather than return to Ukraine or move elsewhere within Europe.<sup>105</sup> Other nations have accepted numbers that are far smaller but still significant in proportion to their populations.

**U.S. Nuclear Weapons in Europe.** In his 2023 EUCOM posture statement, General Christopher Cavoli reaffirmed that:

As long as nuclear weapons exist, NATO will remain a nuclear Alliance. The nuclear capability of NATO-member Nuclear Weapons States deters aggression, prevents coercion, preserves peace, and instills confidence in the Trans-Atlantic bond. The U.S. continues to make available its strategic nuclear forces to defend NATO, serving as the Alliance’s supreme guarantor of security. With key Allies, we maintain the capability to deploy strategic nuclear forces that support Alliance security.<sup>106</sup>

It is believed that until the end of the Cold War, the U.S. maintained approximately 2,500 nuclear warheads in Europe. Today, the U.S. maintains around 100 tactical nuclear warheads that are spread out across bases in Belgium, Italy, Germany, the Netherlands, and Turkey.<sup>107</sup>

In October 2019, reports surfaced that in light of ongoing tensions, the U.S. was considering moving the approximately 50 tactical nuclear weapons stored at Incirlik Air Base in Turkey, but this has not happened. All of these weapons are free-fall, variable yield<sup>108</sup> gravity bombs designed for use with U.S. and allied dual-capable aircraft. Although tactical nuclear weapons are forward deployed to Incirlik, “there are no aircraft capable of delivering the B-61 gravity bombs co-located at Incirlik Airbase.”<sup>109</sup> The U.S. has agreements with Belgium, Italy, Germany, and the Netherlands that allow for delivery of U.S. tactical nuclear weapons by allied aircraft, but “[t]he weapons at Incirlik...are solely for use on U.S. aircraft.”<sup>110</sup> In October 2022, Polish President Andrzej Duda stated that Poland has raised the possibility of taking part in the nuclear sharing program.<sup>111</sup>

The B61 nuclear gravity bomb that is “deployed from U.S. Air Force and North Atlantic Treaty Organization (NATO) bases” is undergoing a life extension program that is expected to add at least 20 years to its service life and “improve the B61’s safety, security, and effectiveness.”<sup>112</sup> According to experts, “[t]he upgrades are all in the non-nuclear aspects of the unguided bomb’s design, and involve removing a parachute and installing a new tail kit and other improvements for ‘significantly greater accuracy.’”<sup>113</sup> The first production unit was completed in February 2022, and the extension program is to be completed by 2026.<sup>114</sup> The U.S. accelerated the fielding of the first upgraded units to Europe to December 2022 rather than Spring 2023 in a decision that was probably meant to reassure allies.<sup>115</sup>

**China.** As noted, NATO’s 2022 Strategic Concept outlines the threat posed by the People’s Republic of China:

The People’s Republic of China’s (PRC) stated ambitions and coercive policies challenge our interests, security and values. The PRC employs a broad range of political, economic and military tools to increase its global footprint and project power, while remaining opaque about its strategy, intentions and military build-up. The PRC’s malicious hybrid and cyber operations and its confrontational rhetoric and disinformation target Allies and harm Alliance security. The PRC seeks to control key technological and industrial sectors, critical infrastructure, and strategic materials and supply chains. It uses its economic leverage to create strategic dependencies and enhance its influence. It strives to subvert the rules-based international order, including in the space, cyber and maritime domains. The deepening strategic partnership between the People’s Republic of China and the Russian Federation and their mutually reinforcing attempts to undercut the rules-based international order run counter to our values and interests.<sup>116</sup>

The growing nexus between Russia and China has been noted by Heritage Foundation analysts as well:

Just weeks prior to Russia’s second invasion of Ukraine, Putin and [Chinese Communist Party

General Secretary] Xi [Jinping] announced a strategic partnership which promised “no ‘forbidden’ areas of cooperation.” While Chinese support hasn’t quite lived up to the hype, Beijing certainly hasn’t been sitting on the sidelines. Recent analysis shows that China is shipping critical components including “navigation equipment, jamming technology and jet-fighter parts to sanctioned Russian government-owned defense companies.” While China isn’t the only nation helping Russia skirt western sanctions, it is the key enabler.<sup>117</sup>

China has significantly increased its presence in the European theater. In 2021, Admiral Burke warned that Chinese warships and investments are “increasingly present” in the Mediterranean and highlighted the potential risk to U.S. and alliance interests from Chinese infrastructure acquisitions in Europe:

Today, the Chinese have a controlling interest in 12 European ports. So, are NATO countries going to be able to count on those ports for Free Trade, and if NATO has to defend Europe, will they allow us into those ports to refuel, re-supply, do repairs, rearm? We don’t know if we can count on that. It’s a troubling pattern and our European partners are increasingly aware and awakened to this potential threat.<sup>118</sup>

Chinese investments in key European infrastructure present two serious risks. First, “port investments could be an indirect source of political leverage—the more a country’s economy benefits from the presence of Chinese port operators, the more it depends on good relations with China.”<sup>119</sup> Second, “China’s investment in European strategic infrastructure has the potential to interfere with allied military mobility—the ability of NATO to move troops and equipment across Europe.”<sup>120</sup>

These concerns may be having some effect. In October 2022, German Chancellor Olaf Scholz’s government agreed to allow a Chinese company to buy a 25.9 percent stake in one of three terminals at the port of Hamburg. Former EUCOM Commander General Ben Hodges criticized the agreement, noting the critical importance of German ports in bringing American troops and equipment into Europe, especially during a crisis: “[K]nowing that the

Chinese may be able to influence or disrupt activities at critical transportation infrastructure, that’s a problem.”<sup>121</sup> Then, in 2023, Germany’s Federal Office for Information Security reclassified the terminal as “critical infrastructure,” setting off a security review that could nullify the deal.<sup>122</sup>

### Important Alliances and Bilateral Relations in Europe

The United States has a number of important multilateral and bilateral relationships in Europe. First and foremost is the North Atlantic Treaty Organization, the world’s most important and arguably most successful defense alliance.

**North Atlantic Treaty Organization.** NATO is an intergovernmental, multilateral security organization that was designed originally to defend Western Europe from the Soviet Union. It anchored the U.S. firmly in Europe, solidified Western resolve during the Cold War, and rallied European support after the 9/11 terrorist attacks. NATO has been the bedrock of transatlantic security cooperation ever since its creation in 1949 and is likely to remain so for the foreseeable future.

In April 2021, following a U.S. decision to withdraw forces from Afghanistan and “recognising that there is no military solution to the challenges Afghanistan faces,” NATO ended Operation Resolute Support, a non-combat operation intended to provide “training, advice and assistance to Afghan security forces and institutions.”<sup>123</sup> The withdrawal of alliance forces was completed in August 2021, and the mission was terminated in September 2021. Currently ongoing operations include:

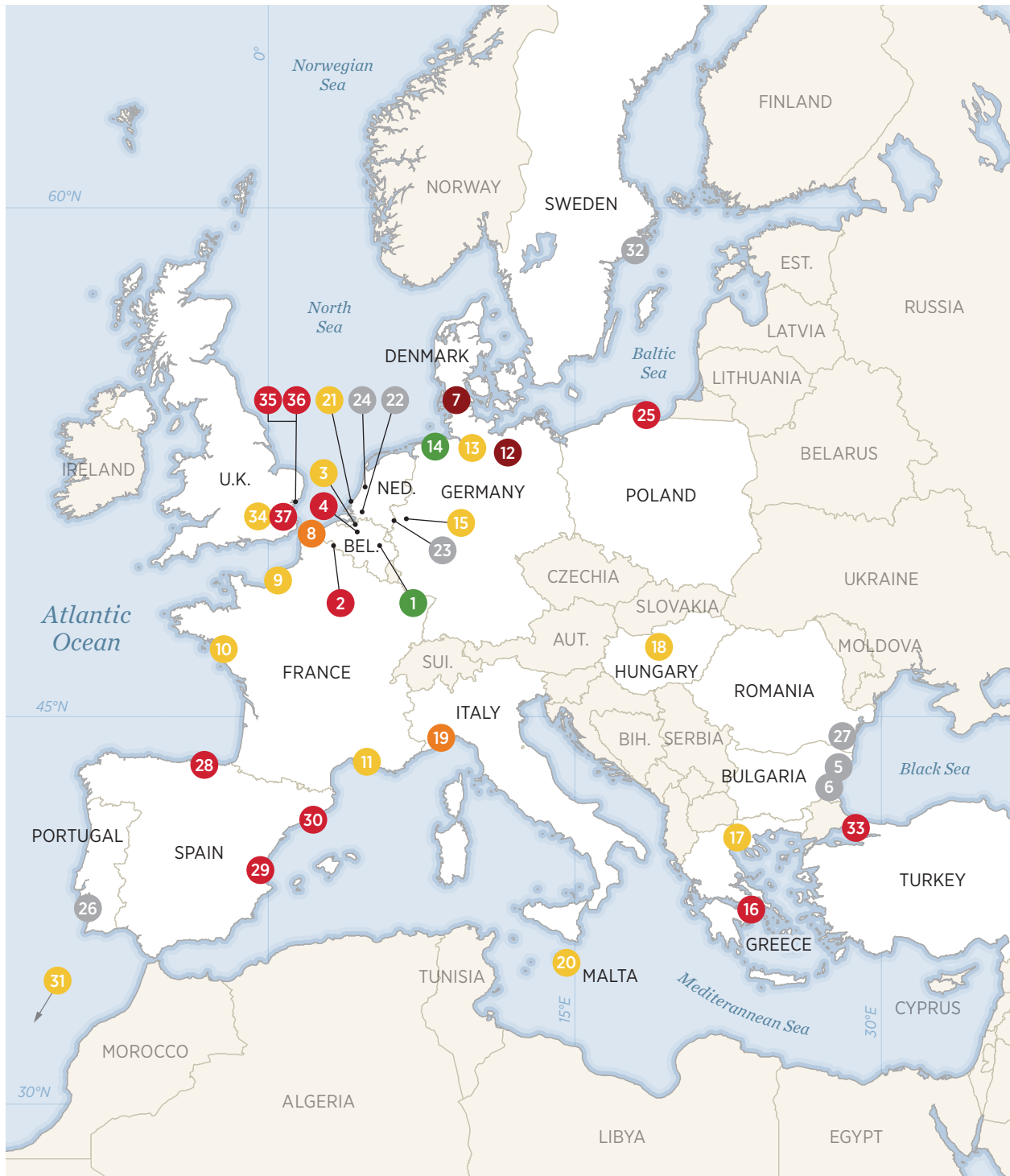
- Kosovo Force (KFOR), which involves 5,081 troops from 31 nations;<sup>124</sup>
- Operation Sea Guardian, which “is NATO’s maritime security operation in the Mediterranean and is presently conducting three maritime security tasks: maritime security capacity building, support to maritime situational awareness and maritime counter-terrorism”;<sup>125</sup>
- NATO Air Policing, “an integral part of NATO Integrated Air and Missile Defence (IAMD) for 60 years” that covers the Baltic States (Estonia, Latvia, and Lithuania); the Benelux countries (Belgium, the Netherlands, and Luxembourg);

TABLE 5

## China's Ownership Stake in European Ports, Airports, and Railways

| Country     | Type    | Site/Location                                    | Unknown | Lease | Less than Half | Nearly Half | Majority | Own |
|-------------|---------|--|---------|-------|----------------|-------------|----------|-----|
|             |         |  | ●       | ●     | ●              | ●           | ●        | ●   |
| Belgium     | Airport | Logistics hub at Liège airport                   |         | 1     |                |             |          |     |
|             | Port    | Zeebrugge (Bruges)                               |         |       |                |             | 2        |     |
|             | Port    | Antwerp Gateway                                  |         |       | 3              |             |          |     |
|             | Port    | Willebroek Terminal                              |         |       |                |             | 4        |     |
| Bulgaria    | Port    | Port of Varna                                    | 5       |       |                |             |          |     |
|             | Port    | Port of Burgas                                   | 6       |       |                |             |          |     |
| Denmark     | Port    | Maersk Container Industry (Tinglev)              |         |       |                |             |          | 7   |
| France      | Port    | Terminal des Flandres (Dunkirk)                  |         |       |                |             | 8        |     |
|             | Port    | Terminal de France (Le Havre)                    |         |       | 9              |             |          |     |
|             | Port    | Terminal du Grand Ouest (Nantes)                 |         |       | 10             |             |          |     |
|             | Port    | Eurofos Terminal (Marseille)                     |         |       | 11             |             |          |     |
| Germany     | Airport | Schwerin-Parchim Airport                         |         |       |                |             |          | 12  |
|             | Port    | Port of Hamburg                                  |         |       | 13             |             |          |     |
|             | Port    | Jade-Weser-Port Logistics Center (Wilhelmshaven) |         | 14    |                |             |          |     |
|             | Railway | Port of Duisburg                                 |         |       | 15             |             |          |     |
| Greece      | Port    | Piraeus Containter Terminal                      |         |       |                |             | 16       |     |
|             | Port    | Port of Thessaloniki                             |         |       | 17             |             |          |     |
| Hungary     | Railway | BILK Kombiterminal (Budapest)                    |         |       | 18             |             |          |     |
| Italy       | Port    | Vado Reefer Terminal (Genoa)                     |         |       |                | 19          |          |     |
| Malta       | Port    | Malta Freeport Terminal (Marsaxlokk)             |         |       | 20             |             |          |     |
| Netherlands | Port    | Euromax Terminal (Rotterdam)                     |         |       | 21             |             |          |     |
|             | Port    | Port of Moerdijk                                 | 22      |       |                |             |          |     |
|             | Railway | Port of Venlo                                    | 23      |       |                |             |          |     |
|             | Railway | Port of Amsterdam                                | 24      |       |                |             |          |     |
| Poland      | Port    | Gdynia Container Terminal                        |         |       |                |             | 25       |     |
| Portugal    | Port    | Port of Sines                                    | 26      |       |                |             |          |     |
| Romania     | Port    | Port of Constanța                                | 27      |       |                |             |          |     |
| Spain       | Port    | Noatum Container Terminal (Bilbao)               |         |       |                |             | 28       |     |
|             | Port    | Noatum Container Terminal (Valencia)             |         |       |                |             | 29       |     |
|             | Port    | Port of Barcelona                                |         |       |                |             | 30       |     |
|             | Port    | Port of Las Palmas (Canary Islands)              |         |       | 31             |             |          |     |
| Sweden      | Port    | Port of Stockholm                                | 32      |       |                |             |          |     |
| Turkey      | Port    | Kumport Sea Terminal (Istanbul)                  |         |       |                |             | 33       |     |
| U.K.        | Airport | Heathrow Airport (London)                        |         |       | 34             |             |          |     |
|             | Port    | Port of Felixstowe                               |         |       |                |             | 35       |     |
|             | Port    | Port of Harwich                                  |         |       |                |             | 36       |     |
|             | Port    | London Thamesport (Kent)                         |         |       |                |             | 37       |     |

SOURCE: Heritage Foundation research.



NOTE: Locations are approximate.

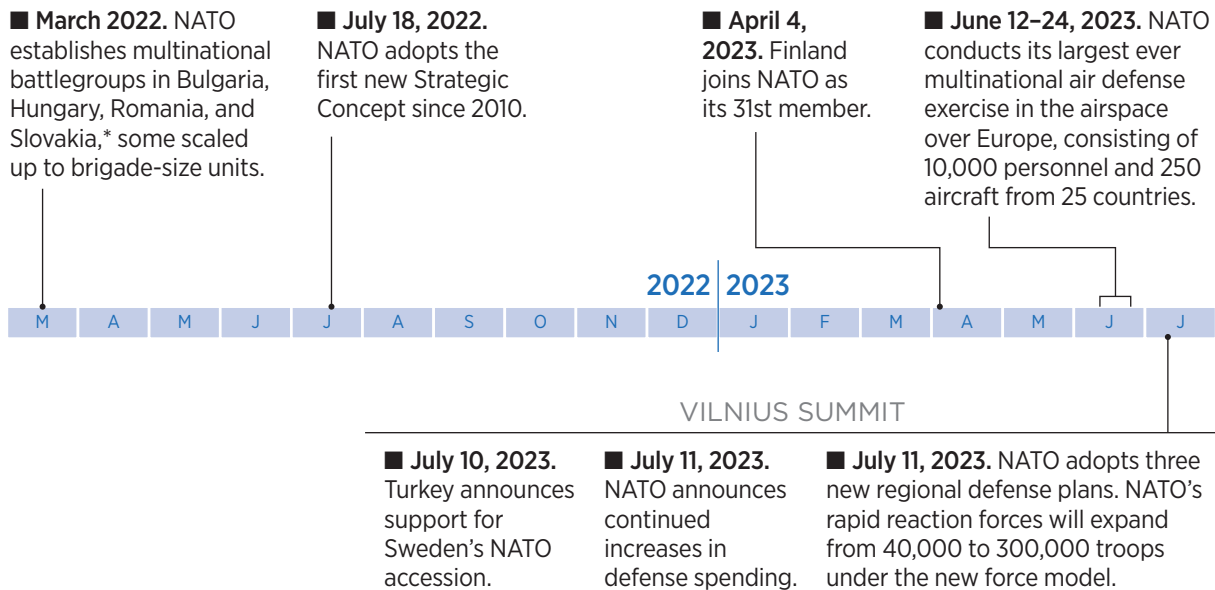
heritage.org

Iceland; and the Adriatic and Western Balkans (Slovenia, Albania, Montenegro, and North Macedonia) in addition to “supplement[ing] the existing NATO Air Policing forces in the

Baltic States, deploy[ing] additional aircraft to Poland, and augment[ing] the national air policing capabilities of the Bulgarian and Romanian air forces”;<sup>126</sup>

FIGURE 2

## Shoring up NATO Defenses: A Timeline of Recent Developments



\* In 2017, multinational battlegroups were established in Estonia, Latvia, Lithuania, and Poland.

SOURCES: North Atlantic Treaty Organization press releases and media reports.

heritage.org

- Support for the African Union Mission in Somalia, which includes “strategic air- and sealift” and “focused support to the African Stand-by Force Concept and its associated projects including exercises, early warning and disaster preparedness”;<sup>127</sup> and
- NATO Mission Iraq (NMI), “a non-combat advisory and capacity-building mission that assists Iraq in building more sustainable, transparent, inclusive and effective armed forces and security institutions, so that Iraqis themselves are better able to stabilise their country, fight terrorism and prevent the return of ISIS/Daesh.”<sup>128</sup>

Underscoring the value of NATO air policing missions, in 2022, NATO jets scrambled 570 times to intercept Russian military aircraft.<sup>129</sup> This was a significant increase over 2021, when NATO jets were scrambled 370 times.<sup>130</sup>

In May 2022, in a historic shift brought about by Russia’s war against Ukraine, Finland and Sweden

applied for NATO membership. On April 4, 2023, Finland became the 31st NATO member state.<sup>131</sup> Sweden, whose accession has yet to be ratified by Hungary and Turkey, is likely to become the alliance’s 32nd member state. The inclusion of Finland and Sweden brings substantial capabilities to the alliance and enhances the security of the Baltic Sea region.

### NATO Responses to Russia’s War in Ukraine.

On February 25, 2022, for the first time in its history, NATO activated approximately one-third of its 40,000-strong NATO Response Force (NRF).<sup>132</sup> In announcing the activation, General Tod Wolters, then NATO Supreme Allied Commander Europe, stated that the NRF “represent[s] a flexible, combat credible force that can be employed in multiple ways.... These deterrence measures are prudent and enhance our speed, responsiveness and capability to shield and protect the one billion citizens we swore to protect.”<sup>133</sup>

In June 2022, the alliance announced that the NRF would be increased from 40,000 to 300,000 troops.<sup>134</sup> Secretary General Stoltenberg noted that



“[f]or the first time since the Cold War, we will have pre-assigned forces to defend specific Allies. So that we can reinforce much faster if needed.”<sup>135</sup> At the June 2022 Madrid summit, NATO agreed to a new force model that will “deliver an allied response at much greater scale and at higher readiness than the current NATO Response Force, which it will replace.”<sup>136</sup> The new force model envisions having “well over 100,000” troops ready within 10 days, “around 200,000” ready in 10–30 days, and “at least 500,000” ready in 30–180 days.<sup>137</sup> The force model also “involves a more focused and ambitious training and exercise programme, including larger-format collective defence exercises.”<sup>138</sup> Filling out and implementing the NATO force model will take time and will certainly hit snags based on the inability of some allies to generate the forces needed to fulfill their quotas.<sup>139</sup>

NATO’s Strategic Concept reaffirms the vitality of the transatlantic alliance and places collective defense of the member states firmly at the heart of NATO. It also clearly identifies the main threat to member states: “The Russian Federation has violated the norms and principles that contributed to a stable and predictable European security order. We cannot discount the possibility of an attack against Allies’ sovereignty and territorial integrity.”<sup>140</sup>

NATO is updating its regional defense plans pursuant to a Political Guidance for Defence Planning 2023 that was approved by NATO Defense Ministers in February 2023.<sup>141</sup> In 2022, General Cavoli stated that “[w]e’re developing strategic, domain-specific and regional defense plans to improve our ability to respond to any contingency and to ensure timely reinforcement.”<sup>142</sup> Some planners have concluded that 300,000 troops will be needed to defend against Russian aggression in the eastern part of the alliance. The first readiness tier of about 100,000 soldiers could come from Poland, Norway, and the Baltic States of Estonia, Latvia, and Lithuania, and a second tier would deploy from countries like Germany.

Once regional defense plans are finalized, “capitals will be asked to weigh in—and eventually make available troops, planes, ships and tanks for different parts of the blueprints.”<sup>143</sup> More troops from allied nations will be placed under SACEUR’s direct command, and “under a new rubric of ‘defend and defend,’ General Cavoli is for the first time since the Cold War integrating American and allied

war-fighting plans.”<sup>144</sup> NATO defense planning will likely become “more demanding and specific,” and “[i]f the other allies all agree that a country’s plan is inadequate, they can vote to force adaptation in what is known as ‘consensus minus one.’”<sup>145</sup>

NATO has eight multinational battlegroups, all of which “are integrated into NATO’s command structure to ensure the necessary readiness and responsiveness.”<sup>146</sup> The first four (Estonia, Latvia, Lithuania, and Poland) were established in 2017 and the second four (Bulgaria, Hungary, Romania, and Slovakia) in 2022. As of June 2023, the composition of these battlegroups was as follows:<sup>147</sup>

Host nation: **Bulgaria**

Framework nation: Italy

Contributing nations: Albania, Greece, Montenegro, North Macedonia, Turkey, and the United States

Host nation: **Estonia**

Framework nation: United Kingdom

Contributing nations: Denmark, France and Iceland

Host nation: **Hungary**

Framework nation: Hungary

Contributing nations: Croatia, Italy, Turkey, and the United States

Host nation: **Latvia**

Framework nation: Canada

Contributing nations: Albania, Czechia, Denmark, Iceland, Italy, Montenegro, North Macedonia, Poland, Slovakia, Slovenia, and Spain

Host nation: **Lithuania**

Framework nation: Germany

Contributing nations: Belgium, Croatia, Czechia, Luxembourg, the Netherlands, Norway, Portugal, and the United States

Host nation: **Poland**

Framework nation: United States

Contributing nations: Croatia, Romania, and the United Kingdom

Host nation: **Romania**

Framework nation: France

Contributing nations: Belgium, Luxembourg,

the Netherlands, North Macedonia, Poland, Portugal, and the United States

Host nation: **Slovakia**

Framework nation: Czechia

Contributing nations: Germany, Slovenia, and the United States

At the Madrid summit, “Allies agreed to enhance the multinational battlegroups from battalions up to brigade size, where and when required.”<sup>148</sup> This phrasing has led to differing interpretations with host nations usually supporting a beefed-up presence on the ground and contributing nations preferring to maintain a smaller footprint. For example, while the United Kingdom briefly doubled its troop presence in Estonia in 2022, for 2023, the Ministry of Defence (MOD) decided that “[i]nstead of the additional battlegroup, the UK will hold at high readiness the ‘balance of a Brigade’ in the UK, available to deploy if needed. The UK will also ‘surge’ forces throughout the year for exercises, enhance its headquarters and provide support to Estonian armed forces.”<sup>149</sup> Similarly, Lithuania has publicly called for a German brigade to deploy to Rukla, and German Chancellor Scholz has said that the decision on permanent deployment of a brigade is “up to NATO.”<sup>150</sup> France deployed a Brigade Forward Command Element to Romania in November 2022<sup>151</sup> but remains cagey about sending additional troops as it seeks to advance further French contracts with Romania.<sup>152</sup>

NATO has also established eight Force Integration Units located in Sofia, Bulgaria; Tallinn, Estonia; Riga, Latvia; Vilnius, Lithuania; Bydgoszcz, Poland; Bucharest, Romania; Szekesfehervar, Hungary; and Bratislava, Slovakia. These new units “will help facilitate the rapid deployment of Allied forces to the Eastern part of the Alliance, support collective defence planning and assist in coordinating training and exercises.”<sup>153</sup>

The U.S.-led DEFENDER (Dynamic Employment of Forces to Europe for NATO Deterrence and Enhanced Readiness) exercises are some of the largest undertaken by the NATO allies. According to U.S. Army Europe and Africa, DEFENDER Europe 23, which was conducted in April, May, and June 2023, was “a U.S. European Command directed multi-national, joint exercise designed to build readiness and interoperability between U.S. and NATO allies

and partners” and was intended to “include more than 7,000 U.S. and 17,000 multi-national service members from more than 20 Allied and partner nations”; “demonstrate U.S. Army Europe and Africa’s ability to quickly aggregate combat power in Eastern Europe”; increase lethality of the NATO Alliance through long-distance fires”; “build unit readiness in a complex joint, multi-national environment”; and “leverage host nation capabilities to increase operational reach.”<sup>154</sup>

As part of these exercises, in June, “250 military aircraft, including 100 from the United States,” participated in Air Defender 2023, “the biggest air defense exercise of its kind in the history of the Euro-Atlantic military alliance”<sup>155</sup> and the U.S. Air National Guard’s “largest deployment across the Atlantic since the Gulf War.”<sup>156</sup>

In October 2019, addressing a NATO capability gap in aerial refueling, the Czech Republic, Belgium, Germany, Luxembourg, the Netherlands, and Norway jointly procured A330 air-to-air refueling aircraft. Currently, seven aircraft are operating out of Eindhoven air base in the Netherlands and Germany’s Cologne–Wahn air base. The eighth and ninth are to be delivered in 2024 and a tenth, ordered in March 2023, in 2026. The tankers were active for the withdrawal from Kabul in 2021 and continue to aid in refueling missions along NATO’s eastern flank, having flown 500 refueling missions in 2022.<sup>157</sup>

In November 2019, NATO announced a \$1 billion upgrade of its Airborne Warning and Control System (AWACS) planes. The upgrades “will provide AWACS with sophisticated new communications and networking capabilities, including upgrades to the NE-3A’s data link and voice communications capabilities, and enhanced Wide-Band Beyond Line-of-Sight airborne networking capability” and will extend the aircrafts’ service life to 2035.<sup>158</sup> In February 2023, NATO began its assessment of industry bids to replace its AWACS fleet under the Allied Future Surveillance and Control (AFSC) capability program, which aims to define ‘a new generation of surveillance and control capabilities’...intended to integrate ‘multiple capabilities and platforms’ for future multidomain operations.”<sup>159</sup> In January 2023, NATO deployed three AWACS and 180 military personnel to a Romanian air base near Otopeni where the aircraft operated for “several weeks.”<sup>160</sup> NATO’s Alliance Ground Surveillance system consists of five RQ-4D Phoenix remotely piloted aircraft based out

of Sigonella, Italy, along with ground command and control stations, and provides “a state-of-the-art Intelligence, Surveillance and Reconnaissance (ISR) capability to NATO.”<sup>161</sup>

In 2018, NATO established two new commands with a combined total of 1,500 personnel: a Joint Force Command for the Atlantic based in Norfolk, Virginia, and a logistics and military mobility command headquartered in Ulm, Germany.<sup>162</sup> Logistics has recently been a significant alliance focus. In November 2022, the chairman of NATO’s Military Committee stated that “[i]n many, many nations—not only the eastern flank—but in many, many nations, there are shortfalls in infrastructure.”<sup>163</sup> Continued shortfalls in the alliance’s ability to move soldiers and equipment swiftly and efficiently include “limitations of road surface weight capacity, bridges capacity and railway traffic limits” as well as differences in rail gauges and continued legal, procedural, and regulatory slowdowns.<sup>164</sup> In November 2022, for example, French tanks traveling through Germany to exercises in Romania were denied transit because their weight exceeded regulations and once inside Romania had to use a circuitous route to get to their base because structural deficiencies had caused a key bridge to be closed.<sup>165</sup>

NATO has worked with the European Union, which retains competencies that are critical to improving military mobility, particularly with regard to overcoming legal and regulatory hurdles, to overcome these barriers. In May 2021, NATO Deputy Secretary General Mircea Geoană noted that continued improvements are needed in such areas as “regulations for swift border-crossing, close coordination between military forces and civil government bodies, access to necessary transport capabilities, and ensuring that national transport infrastructure is fit for purpose.”<sup>166</sup> Former U.S. EU-COM Commander Hodges has described the issue facing the alliance in stark terms: “We do not have enough transport capacity, or infrastructure that enables the rapid movement of NATO forces across Europe,” adding that “[w]hat we have learned from Russia’s war against Ukraine is... that war is a test of will, and it’s a test of logistics.”<sup>167</sup>

Some allies are investing heavily on their own to address infrastructure issues. Poland, for example, is building a €35 billion Solidarity Transport Hub, a project that involves building roads, rails, an airport, military infrastructure, and bridges with a

completion goal of 2028. Polish officials promise that “[i]t will be a place where large tactical connections, large amounts of ammunition, supplies and logistics can be taken to Poland very quickly.”<sup>168</sup>

In April 2022, the alliance established the Defence Innovation Accelerator of the North Atlantic (DIANA). With a \$1.1 billion “innovation fund” that will invest in “deep-tech startups” over a 15-year period and working through “more than 10 accelerator sites and over 50 test centers,” DIANA is “tasked to bring innovative civilian and military organizations closer together to develop cutting-edge solutions in the realms of emerging and disruptive technologies” such as artificial intelligence, autonomy, big-data processing, biotechnology, hypersonic technology, new materials, propulsion, quantum-enabled technologies, and space-related systems.<sup>169</sup> DIANA’s charter was approved in June 2022, and in December, the board of directors “agreed that energy resilience, secure information sharing and sensing and surveillance will be the priority areas of focus for DIANA’s work on Emerging and Disrupting Technologies (EDTs) in 2023.”<sup>170</sup>

**Cyber Capabilities.** NATO’s 2022 Strategic Concept states that:

Maintaining secure use of and unfettered access to space and cyberspace are key to effective deterrence and defence. We will enhance our ability to operate effectively in space and cyberspace to prevent, detect, counter and respond to the full spectrum of threats, using all available tools. A single or cumulative set of malicious cyber activities; or hostile operations to, from, or within space; could reach the level of armed attack and could lead the North Atlantic Council to invoke Article 5 of the North Atlantic Treaty.<sup>171</sup>

Through the NATO Industry Cyber Partnership, NATO has invested in a stronger relationship with industry. This partnership includes “NATO entities, national Computer Emergency Response Teams (CERTs) and NATO member countries’ industry representatives” and is also relevant for small and medium enterprises, which can often provide innovative solutions in cyberspace.” Participants are “encouraged to share reports of intrusion events, participate in damage assessments with the NCI Agency and report any cyber security incident that may be of interest to NATO.”<sup>172</sup>

Cooperation within NATO is also facilitated by two other entities.

- The NATO Intelligence on Cyberspace Community of Interest was created “to more regularly exchange information, assessments and best practices—improving NATO’s ability to prevent and respond to cyber threats.”<sup>173</sup>
- The NATO Communications and Information Agency “is responsible for ensuring that the Alliance has the secure networks, communications and software it needs to guarantee peace and stability for all Allies.” It “also runs the NATO Cyber Security Centre, which is responsible for 24/7 monitoring and defending NATO’s networks from cyber attacks and malicious activity” and upon request “helps Allies and partner countries boost their capabilities in areas such as cyber defence.”<sup>174</sup>

With respect to the likely effects of Chinese 5G technology on the sharing of intelligence in Europe, U.S. officials have said that relying on Chinese state-controlled companies for next-generation wireless networks would be “nothing short of madness.”<sup>175</sup> A Chinese presence in European telecommunications networks could decisively compromise the communications integrity of both the military and the intelligence community. The 2021 Brussels Statement notes that “NATO and Allies, within their respective authority, will maintain and enhance the security of our critical infrastructure, key industries, supply chains, and communication information networks, including 5G.”<sup>176</sup> In April 2023, General Cavoli testified that:

The PRC’s efforts to expand Huawei 5G networks throughout Europe via PRC state-sponsored firms pose security risks to our Allies and partners. These activities allow the PRC to access and exploit intellectual property, sensitive information, technology, and private personnel information. Beyond economic impacts, these technology-related activities provide the PRC a military capacity that put U.S. national interests in the USEUCOM AOR at risk.<sup>177</sup>

Many nations have decided to restrict Chinese vendors from 5G networks, but these threat

perceptions are not uniform, and even within nations that have taken a more restrictive approach, implementation of decisions remains a significant variable.

Recent research sheds perspective on the cascading impact on NATO member states of China’s becoming embedded in the 5G networks:

Huawei’s emergence as a dominant fifth-generation (5G) telecommunications infrastructure supplier for many countries gives Beijing access to key parts of emerging communications networks, generating choke points of vulnerability for Allied nations. Within fifteen years, 5G is likely to be replaced by dual-use 6G technologies with embedded AI-enabled capabilities of military significance. China is likely to incorporate them into its civil-military fusion strategy, as it has with 5G.<sup>178</sup>

The impact of the current patchwork approach to Chinese 5G technology on the European operating environment is a risk that should not be underestimated.

**Space.** The most recent Secretary General’s annual report discusses NATO’s increasingly important work in the space domain:

The space security environment has become more dangerous and unpredictable. At the 2022 Madrid Summit, Allies underlined that strategic competitors and potential adversaries are investing in technologies that could restrict the Alliance’s access and freedom to operate in space, degrade space capabilities, target civilian and military infrastructure, impair defence and harm security. The 2022 Strategic Concept highlights that maintaining secure use of and unfettered access to space and cyberspace is key to effective deterrence and defence. NATO Leaders have committed to enhancing the ability to operate effectively in space and cyberspace to prevent, detect, counter and respond to the full spectrum of threats, using all available tools. NATO Leaders also agreed to boost the resilience of space capabilities.<sup>179</sup>

To enhance its awareness and common understanding of the space environment, NATO

announced plans in 2021 to develop a Strategic Space Situational Awareness System at its Brussels headquarters. The system is being established with funding from Luxembourg and will “allow the Alliance to better understand the space environment and space events, and their effects across all domains.”<sup>180</sup> The NATO Space Center established in 2020 at Ramstein, Germany, continues to increase its connections with national space centers. According to the alliance, following Russia’s full-scale invasion of Ukraine, “NATO Space Centre continuously supported the Alliance’s situational awareness, posture management and decisionmaking. In addition, satellite images delivered by Allies were critical for timely intelligence and for monitoring the situation.”<sup>181</sup>

In addition, NATO’s military authorities have accepted an offer from France to establish a NATO Centre of Excellence devoted to space in Toulouse. In 2022, space operational activities were integrated into several exercises, including “Loyal Leda 2022, Neptune Strike 2022, Coalition Warrior Interoperability Exercise 2022 and Dynamic Mongoose 2022. These exercises help to maintain the Alliance’s advantage and agility, as well as its ability to withstand jamming and other attempts to disrupt its access to space.”<sup>182</sup>

**Ballistic Missile Defense.** NATO’s ballistic missile defense (BMD) achieved initial operational capability in July 2016, offering a stronger capability to defend alliance populations, territory, and forces across the southern portion of Europe from a potential ballistic missile attack. For example:

- An Aegis Ashore site in Deveselu, Romania, became operational in May 2016, and upgrades were completed in August 2019.<sup>183</sup>
- An AN/TPY-2 forward-based early warning BMD radar is located at Kürecik, Turkey, pursuant to the U.S. European Phased Adaptive Approach (EPAA).<sup>184</sup>
- BMD-capable U.S. Aegis-equipped ships are forward deployed at Rota, Spain.<sup>185</sup> General Wolters has characterized Rota’s four current destroyers as the “workhorses of deterrence,” adding that “[w]e currently have a set number of four and the request is for two additional and we have infrastructure in place to be able

to house all six in Rota, Spain.”<sup>186</sup> In June 2022, the U.S. announced its intention to increase the number of destroyers at Rota to six.<sup>187</sup> In January 2023, Spain approved the plan to base two new destroyers at Rota in 2024 and 2025.<sup>188</sup>

- A second Aegis Ashore site in Redzikowo, Poland, was commissioned in September 2020. In March 2023, officials stated that the facility would become operational by the end of the year after summer and fall testing was completed.<sup>189</sup>
- Ramstein Air Base in Germany hosts the command center.<sup>190</sup>
- The U.K. operates an early warning BMD radar at RAF Fylingdales in England. In May 2022, the U.K. announced that its Type 45 destroyers would be upgraded with BMD-capable missiles.<sup>191</sup>

The May 2023 Formidable Shield 23 exercise, which “took place over a 1,000 nautical mile area of water space, from northern Norway to the west coast of Scotland,” involved “multiple NATO Allied and partner nations, more than 20 ships and 35 aircraft, and nearly 4,000 personnel from across the NATO Alliance” who “fired 30 missiles across 23 live-fire scenarios against subsonic and supersonic targets testing capability in the air, land and maritime domains.”<sup>192</sup>

In January 2017, the Russian embassy in Norway threatened that if Norway contributed ships or radar to NATO BMD, Russia “[would] have to react to defend our security.”<sup>193</sup> Norway operates four *Fridtjof Nansen*-class Aegis-equipped frigates that are not currently BMD-capable.<sup>194</sup> A fifth Aegis-equipped frigate, the *Helge Ingstad*, collided with an oil tanker and sustained so much damage that the government decided to scrap it in 2021.<sup>195</sup>

Denmark, which agreed in 2014 to equip at least one of its *Iver Huitfeldt*-class frigates with radar to contribute to NATO BMD, reaffirmed this commitment in the Defence Agreement 2018–2023.<sup>196</sup> Russia’s ambassador in Copenhagen responded by publicly threatening Denmark: “I do not believe that Danish people fully understand the consequences of what may happen if Denmark joins the American-led missile defense system. If Denmark

joins, Danish warships become targets for Russian nuclear missiles.”<sup>197</sup>

In March 2019, the first Dutch *De Zeven Provinciën*-class frigates received a SMART-L Multi-Mission/Naval (MM/N) D-band long-range radar upgrade that is “capable of BMD mission (surveillance and tracking of ballistic missiles) up to 2000 km while simultaneous[ly] maintaining the air defence capability.”<sup>198</sup> In May 2022, the Netherlands announced that for budget reasons, only two of four frigates will receive the radar upgrade and missile upgrades.<sup>199</sup> In May 2021, as part of NATO’s Formidable Shield exercise, radar aboard the HN-LMS *De Zeven Provinciën* “was used to eliminate a ballistic missile, marking a first in Europe.”<sup>200</sup> In December 2020, the Royal Netherlands and German navies signed an agreement to work jointly to develop a replacement for the Dutch *De Zeven Provinciën*-class frigate and Germany’s three F124 *Sachsen*-class frigates.

The Netherlands and Belgium are jointly procuring two anti-submarine warfare (ASW) frigates apiece, the first of which are to be delivered to the Royal Netherlands Navy and Belgium in 2029 and 2030, respectively.<sup>201</sup> The vessels will be equipped with the Evolved Sea Sparrow Missile.<sup>202</sup> Belgian Admiral Jan de Beurme stated in April 2021 that “we are studying the feasibility of integrating ballistic missile defense shooter capabilities into the new frigates.”<sup>203</sup>

Spain currently “operates five F-100 *Alvaro de Bazan*-class Aegis frigates and in 2024 will accept the first F110-class frigate.”<sup>204</sup> Spain’s F-100 frigates are not BMD-capable.<sup>205</sup> In April 2019, Spain signed an agreement to procure five F-110 multi-mission frigates, the first of which will likely be deployed in 2026. These frigates “will host the [Spanish Navy’s] first naval solid-state S-band radar,” which “will form part of the Aegis Weapon System of the ship’s combat management system SCOMBA.”<sup>206</sup>

The Italian Navy is procuring seven multi-role offshore patrol vessels (PPAs) that are to be delivered from 2021–2026. The first of two BMD-capable PPAs in full configuration is scheduled for delivery in 2024.<sup>207</sup>

### Quality of Armed Forces in the Region

Article 3 of the 1949 North Atlantic Treaty, NATO’s founding document, states that members at a minimum “will maintain and develop their

individual and collective capacity to resist armed attack.”<sup>208</sup> Regrettably, only a handful of NATO members are living up to their Article 3 commitments.

In 2022, only seven NATO countries spent the required minimum of 2 percent of GDP on defense: Estonia (2.12 percent); Greece (3.54 percent); Latvia (2.07 percent); Lithuania (2.47 percent); Poland (2.42 percent); the United Kingdom (2.16 percent); and the United States (3.46 percent).<sup>209</sup> However, NATO defense spending continues its upward trend: According to the NATO Secretary General’s annual report for 2022, “European Allies and Canada have increased defense spending for the eighth consecutive year. From 2021 to 2022, defense spending increased by 2.2% in real terms. In total, over the last eight years, this increase added USD 350 billion for defense.”<sup>210</sup>

Although less than a third of member states are attaining the 2 percent benchmark, 24 of 30 member states attained the second benchmark by spending 20 percent of defense budgets on equipment in 2022.<sup>211</sup>

**Germany.** In February 2022, German Chancellor Olaf Scholz characterized Russia’s full-scale invasion of Ukraine as a “turning point” and pledged that “from now on, we will invest more than 2% of gross domestic product in our defense year for year.”<sup>212</sup> An immediate component of Scholz’s pledge was approval of a onetime €100 billion (\$107 billion)<sup>213</sup> procurement fund to rebuild the nation’s military forces. Germany’s Basic Law (constitution) was amended to allow for creation of the special fund, which is financed through loans.<sup>214</sup>

Despite Scholz’s pledge, Germany managed to spend only 1.44 percent of GDP on defense in 2022, although it did hit the second NATO spending benchmark by spending 20.9 percent if its defense budget on equipment.<sup>215</sup> The Ministry of Defence has stated that €30 billion of the €100 billion is already designated for specific contracts.<sup>216</sup> However, some analysts have noted that inflation, taxes, and rising interest payments on the loan have left only €50 billion to €70 billion for actual equipment purchases.<sup>217</sup>

Germany’s decision to acquire new equipment has been hampered by a sclerotic procurement bureaucracy and long delivery times once decisions are made. In addition, many important areas such as rising fuel costs are not covered by the special fund. As a result, Defense Minister Boris Pistorius is reportedly seeking a €10 billion increase in the

regular German defense budget.<sup>218</sup> According to a Defence Ministry spokesperson, “it is clear that we need a constantly increasing defence budget to cover the needs of the military and to be able to react to conditions such as inflation and price increases.”<sup>219</sup>

In 2022, Germany increased the total number of its troops in Lithuania, where it serves as the framework nation for NATO’s EFP battalion, from 1,000 to 1,500.<sup>220</sup> In September, Germany permanently deployed the command unit (100 troops plus “equipment for command and control, communications and logistics”) of a brigade with 3,000–5,000 personnel; combat units remain based in Germany and rotate to the region for exercises.<sup>221</sup> German officials have stated that the brigade could be sent to Lithuania within 10 days in the event of conflict. Lithuanian Defense Minister Arvydas Anusauskas has said that “[t]he defence strategy of the Baltic states cannot rely only on reinforcements. It has to also rely on trustworthy in-place capabilities. Our geography demands it.”<sup>222</sup> Lithuanian Foreign Minister Gabrielius Landsbergis, however, has stated that the facilities in his nation will not be ready to accept a full German brigade until 2026.<sup>223</sup>

Germany and Lithuania plan to spend €200 million over the next few years to upgrade facilities used in part by NATO’s EFP. This project will include “building barracks, command spaces, a canteen and training places.”<sup>224</sup>

In April 2022, Germany deployed Ozelot short-range self-propelled air defense systems with Stinger missiles to Rukla.<sup>225</sup> In August 2022, NATO’s Allied Air Command announced that “[i]n the coming months, Germany augments NATO’s Air Policing mission with their Eurofighter jets flying out of Ämari” and that this was “the 13th time German Air Force fighters support the mission in the Baltic region; Germany led BAP five times in 2005, 2008, 2009, 2011, and 2012, and was the augmenting nation at Ämari—once a year since 2014.”<sup>226</sup> In March 2023, the Luftwaffe announced the initiation of “[j]oint NATO Baltic Air Policing (BAP) missions involving German and British Eurofighter Typhoons” and that “[t]his joint detachment—the first of its kind—will operate under German command until the end of March, after which the German fighters will remain in Estonia throughout April with the mission under British command.”<sup>227</sup>

Germany maintains 68 troops in Kosovo as part of NATO’s Kosovo Force.<sup>228</sup> In February 2023, the

Bundestag extended the mandate for “up to 550 soldiers” to participate in NATO’s Sea Guardian maritime security operation through March 31, 2024<sup>229</sup> and approved a one-year extension, also through March 31, 2024, of Germany’s participation in the United Nations Mission in South Sudan (UNMISS).<sup>230</sup>

In May 2022, Germany announced the end of its participation in the EU Training Mission Mali (EUTM), where 300 German soldiers had served.<sup>231</sup> In November 2022, Germany announced that it would be ending its participation in the U.N.’s Multi-dimensional Integrated Stabilization Mission in Mali (MINUSMA) and that all troops would be withdrawn by the end of 2023. Germany took part in MINUSMA for a decade with up to 1,400 troops but faced difficulties that included the breakdown in relations between France and the military junta in Mali, the growing regional presence of Russian mercenaries, and the frequent need to “suspend reconnaissance patrols after being denied flyover rights.”<sup>232</sup>

In the Middle East, German forces participate in the United Nations Interim Force in Lebanon (UNIFIL) peacekeeping mission, the mandate for which extended through June 2023.<sup>233</sup> In October 2022, Germany extended its non-combat training mission in Iraq and its air-to-air refueling, air surveillance radar, and air transport missions in support of the counter-ISIS coalition through the end of October 2023.<sup>234</sup>

Germany assumed lead authority for NATO’s VJTF in 2023 and “is providing up to 2,700 soldiers as lead nation”<sup>235</sup> with Lithuania, Belgium, Latvia, the Netherlands, Czechia, Slovenia, Luxembourg, and Norway also contributing.<sup>236</sup> In addition, “[f]or the first time, Germany also leads the VJTF’s designated Special Forces command.”<sup>237</sup> In June 2022, Germany announced that it would contribute “15,000 soldiers, 65 aeroplanes, 20 navy units, and other formations to the New Force Model” that was announced at the NATO Summit in Madrid, thereby greatly increasing the strength of the NRF.<sup>238</sup> Germany also has reportedly “agreed to provide NATO with a first operational land division in 2025 to support the Very High Readiness Joint Task Force (VJTF), while long-term targets of providing a modern mechanized division by 2027 and a further two divisions, to the alliance by 2031, both remain.”<sup>239</sup>

Although Germany’s forces have taken on additional roles in recent years, its military continues

to suffer serious equipment, personnel, and readiness issues. In early 2023, Defence Minister Boris Pistorius stated that decades of neglect had left Germany with “no armed forces that are capable of defending [Germany] that is, capable of defending [it] against an offensive, brutally waged aggressive war.” In February, Chief of the German Army Lieutenant General Alfons Mais noted similarly that “[t]he army that I have the duty to lead is more or less bare.” One evocative example is the reality that only 30 percent of the Army’s 300 Leopard 2 tanks are operational.<sup>240</sup>

The navy is not much better off. Problems with submarines include “long yard periods, difficulties with main batteries and the practice of ‘controlled removal’ from some submarines in order to keep others operational.”<sup>241</sup> Reports surfaced in March 2021 that “at least 100” German vessels including submarines rely on a Russian navigation system that does not meet NATO standards and that “[d]uring a worst-case cyberattack, navigation data could be hacked and the ship could fully lose operability.”<sup>242</sup>

According to Parliamentary Commissioner for the Armed Forces Eva Hoegl’s most recent annual report, “compensat[ing] for all shortages...would require a total of EUR 300 billion,” and it “would take around half a century to completely modernise merely the infrastructure of the Bundeswehr already in existence.”<sup>243</sup> Among the many issues raised in the report are kit shortages; shoddy infrastructure; unprofessional and overly bureaucratic personnel management; barracks with walls propped up by sandbags; 66 parachuting accidents; clothing shortages; lack of adequate gear for protecting against biological, chemical, and nuclear attacks; tank shortages that routinely lead to training cancellations; and ammunition shortages. The report estimates that “replenish[ing] the empty ammunition storage sites” would cost “at least EUR 20 billion” but that only “EUR 1.125 billion is available for this purpose in 2023.”<sup>244</sup>

A memorandum from the Inspector of the Army to the Inspector General of the Bundeswehr reportedly states that “without countermeasures,” Germany will not be able to meet its commitment to field a fully equipped Army division by 2025 and calls plans for a second division by 2027 “unrealistic.” The memo reportedly states that under current conditions, “the army will not be able to hold

its own in high-intensity combat and will also only be able to fulfill its obligations to NATO to a limited extent.”<sup>245</sup>

Challenges to the rebuilding of Germany’s military capabilities include a lack of domestic industry capacity, a need to rely on manufacturers to repair and upgrade equipment, manpower shortages, and an outdated and slow procurement structure.<sup>246</sup> “The first projects are on the way,” Defence Commissioner Hoegl has said, “but in 2022 our soldiers still haven’t received a single cent from special funds.”<sup>247</sup> In January 2023, German officials announced plans to use money from the special fund to purchase “for every soldier in the German armed forces in the next three years” such items as “protective gear, helmets, night vision goggles, [and] rucksacks.”<sup>248</sup>

In March 2022, Germany announced an \$8.4 billion deal to purchase 35 F-35A fighters “as replacement for the Tornado in the role of nuclear sharing.” The Tornados are to be phased out between 2025 and 2030. The Luftwaffe also announced the purchase of 15 Eurofighter Typhoons “equipped for electronic warfare.”<sup>249</sup> German pilots will be trained on the platform in the U.S. beginning in 2026, and training will then move to Germany in 2027, and initial operational capability should be declared in 2028. The planned F-35 base at Büchel will require major upgrades to be ready by 2027.<sup>250</sup>

Germany has stated that these purchases do not change its commitment to take part in the Future Combat Air System (FCAS). In December 2022, a contract was awarded to develop a flying demonstrator for the FCAS with “in flight demonstrators” sought by 2028 or 2029. This contract covers “FCAS Phase 1B. Running for around three and a half years, this phase will include broader research and technology (R&T) elements, as well as the flying demonstrators themselves and related subsystems.”<sup>251</sup> FCAS, which is funded in equal measure by France, Germany, and Spain, has been slowed by industry “[w]orkshare-related delays.”<sup>252</sup> After delays awaiting U.S. approval, which is needed because “the Arrow-3 includes technological components developed in the US,” Germany intends to procure the Israeli-made Arrow-3 anti-ballistic missile defense system for \$3.1 billion once the Bundestag has given its required approval.<sup>253</sup> In March 2021, the Ministry of Defence announced plans to upgrade its Patriot missiles to keep them in service until 2030



and to invest in drone technology rather than a next-generation air defense platform.<sup>254</sup>

Pursuant to Germany's offer to send Poland three Patriot missile batteries to help defend against incoming missiles, the first two were sent in January 2023 along with 350 German troops.<sup>255</sup> The batteries are stationed at Zamość, and "the system comprises more than 10 elements, including radars, guiding units and launchers, which can hold between four and sixteen missiles each."<sup>256</sup> The performance of the IRIS-T air defense system in Ukraine led Germany to purchase eight systems for itself in February.<sup>257</sup>

Germany operates Europe's largest fleet of heavy transport aircraft and has taken delivery of 40 of 53 A400M cargo aircraft ordered.<sup>258</sup> France and Germany are procuring a joint transport capability with C-130J Hercules aircraft and KC-130J tankers. The French Air and Space Force and the German Luftwaffe are providing two and three of each aircraft, respectively, and all should be received by the end of 2024 with full operating capability expected by 2024–2025.<sup>259</sup> A new joint training center for both aircraft in Normandy is scheduled to begin operations in 2024.<sup>260</sup> The aircraft will be based at Évreux, France, where "this binational air transport squadron will have unrestricted exchange of aircraft, air crews, and maintainers, as well as technical and logistical support based on a common pool of spare parts and a common service support contract."<sup>261</sup>

Germany announced the end of its P-3C ORION maritime patrol aircraft (MPA) modernization program in June 2020. In July 2021, Germany's Defence Ministry signed a letter of offer and acceptance to procure five P-8 Poseidon maritime patrol aircraft under the U.S. government's Foreign Military Sales process.<sup>262</sup> In September 2021, Boeing signed a contract with the U.S. Navy to produce the five planes at a "total price tag" of \$1.6 billion with deliveries to begin in 2024.<sup>263</sup> In April 2022, "sources confirmed that the German Navy will add 7 additional Boeing P-8A Poseidon to complete a fleet of 12 Maritime Patrol Aircraft (MPA)."<sup>264</sup> In July, parliament approved a \$344 million support package for things like training, future software upgrades, and spare parts.<sup>265</sup>

In June 2022, Germany announced plans to purchase 60 Block 2 CH-47F Chinook transport helicopters at a cost of \$5.36 billion. Each helicopter will have "an aerial-refueling probe to enable connections with the Lockheed KC-130J Hercules

and potentially the Airbus A400M airlifter configured as a tanker."<sup>266</sup>

In April 2022, an agreement was struck for the procurement of 140 missiles for Germany's five Heron TP unmanned aerial vehicles (UAVs).<sup>267</sup> Armed drones have been a contentious political issue for years in Germany, resisted in large part by the Social Democrats. That the decision has now been taken is a significant shift. Germany, France, Italy, and Spain plan to acquire a collective fleet of Eurodrones at an estimated total cost of \$7.5 billion. Germany will have seven systems, each with two ground stations and three aircraft.<sup>268</sup>

In January 2023, officials stated that all Leopard 2 main battle tanks would be upgraded to the 2A7 configuration; the upgrades, which include digitizing the tanks' turrets, are expected to keep the Leopards in service until 2045.<sup>269</sup> Germany continues to work with France on development of the Main Ground Combat System (MGCS), which will replace both nations' MBTs<sup>270</sup> and is currently projected to reach full operational capability in 2040.<sup>271</sup> In addition, contract negotiations are "underway for 133 Boxer heavy weapon carrier (HWC) armored vehicles, which will see deliveries start in 2025 and run through to 2030."<sup>272</sup>

Germany's troubled F-125 *Baden-Württemberg*-class frigate procurement has been completed. In December 2017, the frigate failed sea trials because of "software and hardware defects."<sup>273</sup> It reportedly had "problems with its radar, electronics and the flameproof coating on its fuel tanks," was "found to list to the starboard," and lacked sufficiently robust armaments as well as the ability to add them.<sup>274</sup> In addition, the frigate's ability to defend against aerial attack is so deficient that the ship may be fit only for "stabilization operations," and the lack of sonar and torpedo tubes makes it vulnerable to attack by submarines.<sup>275</sup> Germany returned the ship to the shipbuilder following delivery.<sup>276</sup> The redesigned *Baden-Württemberg* was belatedly commissioned in June 2019, and Germany took delivery of the fourth and final F-125 in January 2022.<sup>277</sup>

In January 2020, Germany awarded a \$6.7 billion contract to the Dutch Damen Shipyards for the next-generation F-126 frigate.<sup>278</sup> Damen is building the frigates "together with its [German] partners Blohm+Voss and Thales," and the first of four ordered (with the possibility of another two) is to be delivered in 2028.<sup>279</sup> In November 2022, Damen

signed an agreement with Rheinmetall to produce two MLG27-4.0 naval guns for each vessel.<sup>280</sup>

In July 2021, Germany and Norway signed an agreement for a joint program to construct six Type 212CD submarines, two for Germany and four for Norway, the first of which are to be delivered to the Norwegian Navy in 2029 with Germany taking delivery of its submarines in 2032 and 2034.<sup>281</sup> German K130 Corvette procurement is currently at least two years behind schedule, and it is not expected that the first of five vessels will be commissioned until 2025 at the earliest.<sup>282</sup>

Germany has increased its presence in the Indo-Pacific. The frigate *Bayern* returned in February 2022 from a seven-month deployment that included official port visits to Australia, Japan, India, Israel, Pakistan, Singapore, South Korea, Sri Lanka, and Vietnam.<sup>283</sup> In March 2022, the Luftwaffe deployed six Eurofighters, four transport aircraft, three air-to-air refueling tankers, 100 tons of matériel, and 250 soldiers to Darwin, Australia, for military exercises with allies. Transferring the deployment to Singapore en route to Darwin took place in less than 24 hours as part of a “strategic deployment capability.”<sup>284</sup>

German Indo-Pacific deployments are visible and strategically valuable, but they also strain the military. According to one analyst, the six-month deployment of the *Bayern* to the Mediterranean, Indian Ocean, and Pacific theater beginning in August 2021 “came ‘at the price of gutting the fleet,’ with ship maintenance plans and training schedules altered to accommodate the *Bayern* mission.” Even Germany’s robust contribution to Baltic Air Policing closer to home “takes everything it has, often at the expense of training initiatives.”<sup>285</sup>

Germany also suffers from a shortage of personnel. The military, which as of December 31, 2022, included “183,051 service personnel,” has “a long way to go to achieve the target figure [of 203,000 personnel] by 2031, especially with numbers of applications also declining significantly by around 11 per cent in [2022].”<sup>286</sup>

Germany’s significant cultural aversion to military service remains a difficult obstacle to overcome. A survey in August 2022 found that “52 percent of Germans said the country should continue practicing restraint in international crises, and 68 percent rejected the notion that Germany should become a leading military power in Europe.”<sup>287</sup>

**France.** France has one of NATO’s most capable militaries and retains an independent nuclear deterrent capability. It rejoined NATO’s Integrated Command Structure in 2009 but remains outside the alliance’s nuclear planning group.

In 2022, France spent 1.89 percent of GDP on defense and 28.55 percent of defense spending on equipment, just short of both NATO benchmarks.<sup>288</sup> In January 2023, President Emmanuel Macron announced a major increase in defense spending: a planned \$450 billion for 2024–2030 compared to \$320 billion for 2019–2025, an increase of over one-third.<sup>289</sup> The previous military program law (LPM) focused on expeditionary forces and counterterrorism; the upcoming LPM will focus largely on high-intensity state-on-state warfare.<sup>290</sup> France is also planning to add €1.5 billion to its 2023 defense budget with increases of €3.1 billion in 2024; €3 billion each year in 2025, 2026, and 2027; and €4.3 billion each year in 2028, 2029, and 2030.<sup>291</sup>

Following the Cold War, France drew down the capabilities needed for peer-to-peer conflict. Between 1991 and 2021, “the number of battle tanks dropped from 1,349 to 222, the number of fighters from 686 to 254, the number of large surface ships from 41 to 19 and its active-duty manpower from 453,000 to 203,000.” “Today, the French Army is beautiful,” French General Eric Laval has said, “but in a high intensity conflict, would it be able to hold beyond 48 hours? High intensity would imply potentially very tough battles which could last between 72 to 96 hours and which we are not allowed to lose.” Chief of the Army General Pierre Schill has described the current transformation process as the “most important modernization undergone since World War II.”<sup>292</sup>

The new LPM focuses on such areas as nuclear modernization, drone/anti-drone technology, air defenses, and intelligence gathering.<sup>293</sup> “Nuclear deterrence,” according to President Macron, “is an element that makes France different from other countries in Europe. We see anew, in analysing the war in Ukraine, its vital importance.”<sup>294</sup> French intelligence agencies will see a 60 percent increase in their budgets, although some analysts have predicted that high energy prices and inflation will reduce the value of that increase. “Capabilities in all layers of air defense will increase by at least 50 percent,” Macron has explained, “obviously including anti-drone technologies.” Long-range strike capability,

the suppression of enemy air defense, and anti-submarine warfare “are all part of these priorities.”<sup>295</sup>

The LPM also calls for France to maintain a focus on its overseas territories, particularly in the Indo-Pacific,<sup>296</sup> and to expand industrial capacity. “An issue we unfortunately rediscovered with the war in Ukraine is the issue of the ammunition stocks,” Armed Forces Minister Sébastien Lecornu has said. “We will need a ten-year period of time to upgrade all infrastructures and equipment of our military.”<sup>297</sup>

Air Force procurements include an upgrade to the aerial refueling and airlift fleet. In February 2020, France received the second of two KC-130J Super Hercules.<sup>298</sup> It also has been introducing new A330 MRTT (Multi-Role Tanker Transport) aircraft and as of April 30, 2023, had received nine of 13 ordered.<sup>299</sup> France has received 21 of 50 A400M Atlas military transport aircraft ordered, and the “military programming law plans for a fleet of 25 A400Ms to be in service in 2025.”<sup>300</sup> In October 2020, the government announced that the final 10 NH90 Tactical Troop Helicopters on order for delivery in 2025 and 2026 would be upgraded to meet special forces requirements.<sup>301</sup>

In January 2023, Macron announced that France would move to an “all-Rafale force” by 2035.<sup>302</sup> France signed a \$2.3 billion agreement with Dassault Aviation in January 2019 for development of the F4 Standard upgrade to the Rafale fighter aircraft, the first of which was received in March 2023. The “new standard includes upgrades to existing capabilities like the Thales AESA radar and Talios targeting pod along with the Rafale’s electronic warfare system and communications suite,” and “the Thales Scorpion Helmet Mounted Display, MBDA’s MICA NG (Next-Generation) air-to-air missile and the 1,000 kilogram variant of Safran’s AASM (armement air-sol modulaire) ‘Hammer’ precision-guided munition” are among the plane’s “new capabilities.”<sup>303</sup> France is expecting to receive 13 Rafales during the year with deliveries of another 40 to be completed by 2025.<sup>304</sup> Forty-two additional Rafales will be ordered in 2023, partly to backfill aircraft sold to Croatia in 2021.

Introduction of the Rafale F5 standard is planned for the 2035–2038 period. It is expected that the F5 will “further improve connectivity,” “have enhanced manned/unmanned teaming capabilities,” and “be capable of carrying the new ASN4G hypersonic ramjet missile, which will ensure the

continuity of the airborne component of the French nuclear deterrent, replacing the ASMP-A missile.”<sup>305</sup>

In May 2021, France, Germany, and Spain signed an agreement to develop a flying demonstrator aircraft for the Future Combat Air System (FCAS), which is to begin entering service in 2040.<sup>306</sup> In December 2022, the governments working on FCAS awarded a \$3.4 billion contract to develop flying demonstrators by 2028 or 2029.<sup>307</sup> In March 2022, France announced that it would upgrade 42 of 67 Tiger MkIII attack helicopters at a cost of \$3.06 billion with delivery expected in 2029.<sup>308</sup> Because a lack of German interest has made the planned capability upgrades increasingly unaffordable, “the less extensive Tiger upgrade now planned may lack new missiles,” although it “retains sensors and communication enhancements that perhaps can be paired with pre-existing advanced missiles...”<sup>309</sup>

France established a 220-person Space Command under the French Air Force in September 2019. In September 2022, Prime Minister Élisabeth Borne announced that France would increase its space investments by 25 percent (\$9 billion) over the next three years with launch vehicles as “a major priority.”<sup>310</sup> In January 2021, NATO approved a Center of Excellence for Military Space to be located alongside French Space Command in Toulouse. The first researchers arrived in 2021, and the center is to be fully staffed by 2025.<sup>311</sup>

France intends to have a “fully capable” system to defend its space assets in place by 2030. “If our satellites are threatened,” then-Armed Forces Minister Florence Parly stated in 2019, “we intend to blind those of our adversaries. We reserve the right and the means to be able to respond: that could imply the use of powerful lasers deployed from our satellites or from patrolling nano-satellites.”<sup>312</sup> However, in November 2022, France pledged “not to conduct destructive direct-ascent anti-satellite missile tests.”<sup>313</sup>

In March 2021, with German and U.S. space forces also participating, France launched AsterX, its first military exercise in space, “to evaluate its ability to defend its satellites and other defense equipment from an attack.”<sup>314</sup> AsterX 23 took place in February and March 2023, again with the U.S. participating. Instead of “the time-lapse approach used in previous editions, the 2023 iteration took place “in real-time,” which “provides increased tactical realism during the phases of data processing

and space situation analysis.”<sup>315</sup> France is reportedly working on a ground-to-space laser system and planning to launch “a new orbital space surveillance project, using nanosatellites to patrol Geostationary Orbit (GEO), identify potential on-orbit threats to national assets, and if necessary, disable the threat with an on-board laser.”<sup>316</sup>

Army procurements include Kochi HK416 Assault Rifles, more than 50 percent of which had been delivered as of March 2022; 300 ANAFI USA micro-drones; and 364 Serval Armored Vehicles ordered in 2021 with the possibility of more than 900 being ordered by 2030.<sup>317</sup> As of January 2023, the Army had received 38 JAGUAR armored reconnaissance and combat vehicles and 452 GRIF-FON multi-role armored vehicles since 2019.<sup>318</sup> In December 2022, the Army ordered 50 upgraded Leclerc tanks, 18 of which are set to be delivered in 2023.<sup>319</sup> The upgrade includes a new fire control system as well as “enhanced protection against mines and rockets” and “a 7.62-millimeter remotely-operated turret to support urban combat.”<sup>320</sup>

France plans to invest €58 million in the Main Ground Combat System, a next-generation tank that is being developed jointly with Germany.<sup>321</sup> The program, however, remains stuck in study and design, a sluggish start that the French Armed Forces Minister, in February 2023 testimony before a committee of the French Senate, “appeared to attribute...largely to discord between the ambitions of the German government and its industry vendors as well as industry infighting.”<sup>322</sup>

One major project is an upgrade to the French sea-based and air-based nuclear deterrent. The French military procurement agency test-fired the M51.2, the current three-stage, sea-land strategic ballistic missile (without a warhead), in April 2021 as part of a development program for the M51.3, which is expected in 2025.<sup>323</sup>

France’s sea-based deterrent is provided by four *Le Triomphant*-class ballistic missile submarines.<sup>324</sup> In March 2022, in response to Russian aggression and threats, France reportedly had three of its four ballistic missile submarines at sea at the same time—something that has not happened in decades. Similar messaging was behind the successful test of the ASMP-A air-launched nuclear weapon in March 2022.<sup>325</sup>

The government launched France’s third-generation ballistic missile submarine program in

February 2021. Delivery of the first submarine is planned for 2035 with three additional subs to be delivered every five years after that. Former Armed Forces Minister Parly has described the third-generation submarines in colorful terms as able to “hear better and defend themselves better whilst at the same time being more silent: They will not make more noise than a school of shrimp.”<sup>326</sup>

Other major naval procurements include \$1.09 billion through 2025 for the design phase of a new nuclear-powered aircraft carrier (a model of which was unveiled in October 2022) that will deploy 32 Future Combat Aircraft Systems and is planned to enter service in 2038.<sup>327</sup> In December 2021, the U.S. Department of State’s Defense Security Cooperation Agency (DSCA) cleared a potential \$1.3 billion sale to France of an Electromagnetic Aircraft Launch System (EMALS), an Advanced Arresting Gear (AAG) system, and related equipment for its new carrier, which will incorporate two or three relatively new electromagnetic catapult systems. According to the DSCA, “[t]he proposed sale will result in continuation of interoperability between the United States and France.”<sup>328</sup> In August 2022, the U.S. Department of Defense (DOD) awarded a contract for the development of EMALS and AAG for the French carrier.<sup>329</sup>

The *Suffren*, the first of six new fifth-generation *Barracuda*-class nuclear-powered attack submarines, was commissioned in November 2020.<sup>330</sup> The second, the *Duguay-Trouin*, began sea trials in March 2023.<sup>331</sup> The remaining four, the *Tourville*, *De Grasse*, *Rubis*, and *Casabianca*, “are scheduled for delivery no later than 2030.”<sup>332</sup>

France is procuring five defense and intervention frigates, the first of which is due in 2024 and the second and third of which are due in 2025.<sup>333</sup> In November 2022, the French Navy took delivery of the FREMM multi-mission frigate *Lorraine*, the last of eight FREMMs procured.<sup>334</sup> The final two have enhanced air defense capabilities in addition to the focus on anti-submarine warfare that characterizes the six that were delivered between 2012 and 2019.<sup>335</sup>

In November 2020, France announced the overhaul of its mine countermeasures systems by 2029.<sup>336</sup> In the same month, France and the U.K. signed a production contract for the joint Système de lutte anti-mines futur (SLAM-F) program, known in the U.K. as the Maritime Mine Counter Measures (MMCM) system, which “combines

unmanned underwater and surface vehicles and should enable sailors to operate outside of the mine field.”<sup>337</sup> Identical unmanned mine-hunting demonstrators were delivered to France and the U.K. in December 2021.<sup>338</sup> The SLAM program’s first mine warfare drones are expected in 2023.<sup>339</sup>

In December 2016, France opened a cyber-operational command.<sup>340</sup> In April 2023, the Ministry of Defense announced that among the planned investments in the government’s proposed 2024–2030 military programming law is “€4 billion for cyber defense.” Other plans outlined in the latest LPM include “€16 billion for munitions, including the modernization of long-range anti-ship missiles, as well as F321 heavy torpedoes and new surface-to-air and air-to-air interceptors (MBDA’s Aster-MICA and METEOR families, respectively);” “€10 billion for innovative technology investments, to include directed energy technology, swarming drones, and robotic capabilities;” and “€6 billion for the space domain.”<sup>341</sup>

France, which has NATO’s third-largest complement of active-duty personnel,<sup>342</sup> withdrew the last of its troops from Afghanistan at the end of 2014, although all of its combat troops had left in 2012. France continues to remain engaged in the fight against the Islamic State, deploying 600 troops in Operation Chammal.<sup>343</sup> In February 2022, the *Charles de Gaulle* Carrier Strike Group undertook a three-month operational deployment to the Mediterranean that included support for Operation Chammal. During the deployment, the CSG took part in “‘tri carrier operations’ with the Italian Navy...Cavour CSG and the U.S. Navy’s Truman CSG” to “maintain interoperability between allied navies, and train with new assets such as Italian F-35Bs, and American E-2D Advanced Hawkeye aircraft.”<sup>344</sup>

In November 2022, the CSG left France again for a deployment to the Mediterranean and Indian Ocean in Mission Antares. “During the Mediterranean phase of the deployment, the Charles De Gaulle CSG included U.S. Navy destroyer USS *Arleigh Burke* (DDG-51), Italian Navy frigate ITS *Virginio Fasan* (F 591) and the Hellenic Navy frigate HS *Adrias* (F459).” In January 2023, the *Charles de Gaulle* and a French Maritime Patrol Aircraft took part in bilateral exercises with the Indian Navy off the western Indian coast. Simultaneously, a French A330 MRTT and three Rafales deployed to a Singaporean air force base for exercises.<sup>345</sup>

France’s contributions to NATO deterrence missions in Eastern Europe include the deployment of approximately 219 soldiers to Estonia as part of NATO’s Enhanced Forward Presence.<sup>346</sup> France also has deployed 500 troops and an air defense system to Romania where it serves as framework nation for one of NATO’s battlegroups.<sup>347</sup> France has taken part in Baltic Air Policing 10 times, most recently with four French Rafale jets flying out of Lithuania from December 2022 to March 2023.<sup>348</sup> French fighters continue to fly air patrol missions over Bulgaria, Croatia, Poland, and Romania from bases in France as part of NATO’s “enhanced Vigilance Activities [eVA].”<sup>349</sup>

France, which NATO reported in March 2022 was leading “this year’s highest-readiness element of the NRF, a multinational force comprised of up to 40,000 land, air, maritime and special operations personnel that NATO can deploy at short notice as needed,”<sup>350</sup> is preparing for high-intensity warfare. In February 2023, it launched ORION (Operations for a Resilient, Integrating, high-intensity Oriented and New Army) 23, “France’s biggest war games in decades,” which involved 12,000 troops from allied nations, including 7,000 French troops, as well as “naval and land vehicles, aircraft and an aircraft carrier.” There was a clear emphasis on large-scale conflict including amphibious landings. “Such preparation is absolutely essential,” explained General Vincent Desportes, “and I hope that it will be reproduced in the future so that we regain the know-how of managing large, joint forces that we lost because we have been focused on narrow operations in small spaces with relatively limited means for the past two decades.”<sup>351</sup>

On February 17, 2022, President Macron announced that France would “begin a military withdrawal [of its 2,400 troops] from Mali after more than nine years fighting a jihadist insurgency” and that “[t]he heart of this military operation will no longer be in Mali but in Niger...and perhaps in a more balanced way across all the countries of the region which want this [help].”<sup>352</sup> France has reduced its force in the Sahel region from 4,300 to 3,000 troops in Chad and Niger and has 1,500 troops stationed in Djibouti, 900 in Côte d’Ivoire, 350 in Gabon, and 400 in Senegal.<sup>353</sup> It also has 700 troops stationed in the United Arab Emirates,<sup>354</sup> and a 15-year defense agreement between the two countries has been in effect since 2012.

In the Mediterranean, French Rear Admiral Jean J. de Muizon is Deputy Operation Commander of the EU-led Operation Irini, which is charged principally with enforcing a U.N. arms embargo on Libya.<sup>355</sup> France also conducts occasional freedom-of-navigation operations in the Pacific. In April 2023, it reportedly conducted a freedom-of-navigation operation through the Taiwan Strait, most likely with the Frigate *FS Prairial*.<sup>356</sup>

France is keenly aware of and concerned about Chinese activity in the Pacific. In June 2021, French Admiral Pierre Vandier said that France faced “a logic of suffocation” in the region because of China’s activities:

We have a lot of evidence showing a change in posture. Our boats are systematically followed, sometimes forced to maneuver in front of Chinese ships to avoid a collision, in defiance of the rules of freedom of navigation that we defend. Some of our stopovers in countries in the region where we used to pass are canceled at the last moment, without clear explanations.<sup>357</sup>

The French-led, Abu Dhabi–based Awareness Strait of Hormuz initiative to help patrol the waters near Iran became operational on February 25, 2020. France continues to contribute to the initiative’s military mission, Operation Agenor.<sup>358</sup>

At 10,000 soldiers, Operation Sentinelle, launched in January 2015 to protect the country from terrorist attacks, is the largest operational commitment of French forces.<sup>359</sup> A 2021 RAND Corporation study found that French forces were highly capable but struggled with readiness, which would become increasingly apparent in large-scale conflict: “[T]he French armed forces lack depth, meaning that demanding operations would quickly exhaust both France’s human and material resources.”<sup>360</sup> Operation Sentinelle has been a significant burden on French forces since its inception. With the military slated to assist in securing the 2024 Paris Olympics, military leaders worry that any additional tasks levied as the games approach will further strain resources.<sup>361</sup>

**The United Kingdom.** America’s most important bilateral relationship in Europe is its Special Relationship with the United Kingdom. From the sharing of intelligence to the transfer of nuclear technology, a high degree of military cooperation has helped to make this relationship unique.

In 2022, the U.K. spent 2.16 percent of GDP on defense and 28.1 percent of its defense budget on equipment, meeting both NATO benchmarks.<sup>362</sup> On March 15, 2023, Chancellor of the Exchequer Jeremy Hunt announced that “we will add a total of £11 billion to our defense budget over the next five years and it will be nearly 2.25% of GDP by 2025.” On March 13, the government had announced a £5 billion increase that “over the next two years would be spent on Britain’s nuclear submarine building and support activities and replenishing missile and munition stocks depleted by the supply of weapons to Ukraine.” Two days later, the Treasury announced the addition of another £6 billion, to be “equally split across the final three years of a five-year period starting 2023/24.”<sup>363</sup>

The U.K., which will spend around £48 billion on defense in 2023, remains committed to raising defense spending to 2.5 percent of GDP but without a fixed target date.<sup>364</sup> The new funding will be used in part for acquisitions, including frigates, Type 32 warships, and the U.K.’s Future Combat Air System. The U.K. is also standing up a Space Command and an Artificial Intelligence Center.<sup>365</sup>

In March 2023, the government released its *Integrated Review Refresh 2023 (IR23)*,<sup>366</sup> updating *Global Britain in a Competitive Age*, which had been published in 2021.<sup>367</sup> Then, in July, the government released *Defence’s Response to a More Contested and Volatile World*,<sup>368</sup> updating its 2021 Defense Command Paper.<sup>369</sup>

IR23 argues that a refresh was necessary in part because “the transition into a multipolar, fragmented and contested world has happened more quickly and definitively than anticipated.”<sup>370</sup> It further states that “the government’s overarching assessment is that the broad direction set by IR2021 was right, but that further investment and a greater proportion of national resource will be needed in defence and national security—now and in the future—to deliver its objectives.”<sup>371</sup>

The “Ministerial Foreword” to the Defence Ministry’s 2023 Command Paper states frankly that there are “no new commitments on platforms at all—because on that we stand by what we published in 2021. Instead, we focus on how to drive the lessons of Ukraine into our core business and to recover the warfighting resilience needed to generate credible conventional deterrence.”<sup>372</sup>

The return of major war to the continent of Europe—alongside growing threats elsewhere in the world—means we need to sharpen our approach. We need to ensure our warfighting capabilities are robust and credible to be able to deter threats from manifesting in the first place, but also to fight and win if they do. We need to be able to defend the homeland and make ourselves more resilient to all types of shocks. We need to be able to sustain operations today—with sufficient stockpiles of munitions, and critical enablers—as well as investing now in the battle-winning capabilities of the future. We must address increasingly complex and diverse threats, by maximising our own growing but ultimately finite resources, which necessitates ruthless prioritisation and improved productivity.<sup>373</sup>

**The Command Paper specifies a notable change in emphasis “From Platform-centric to Technology-centric.” Specifically:**

We must...think differently about the Armed Forces themselves. To stay at the cutting edge, we need to move decisively away from a platform-centric approach in favour of a focus on the military effects we are seeking to achieve. Through a technology-centric approach we will achieve an acceleration in battlefield decision making, greater mass, increased productivity in the force and, most importantly, significantly more lethality.

In those areas where we do continue to require platforms, we will increasingly procure based on a clear technology strategy, driving more innovative and future-proofed solutions. We will prioritise the ability to upgrade and evolve through-life rather than see platforms that were highly integrated at the point of design becoming technologically obsolete whilst still relatively new from an automotive perspective. We will typically achieve this through open architectures, rapid software updates, and hardware modularity. Across major programmes, we will ensure much stronger technological feasibility and deliverability assessments within our scrutiny and approvals processes.<sup>374</sup>

**Additionally:**

The operational productivity of the force—**ensuring greater levels of lethality and readiness**—is essential given the threats we face. As well as exploiting new technology to this end, we have established a dedicated programme to **increase our operational productivity** across the enterprise, focusing on increasing the readiness of our assets. Defence is already well set, with access to some of the very best military capabilities that exist. However, our studies have shown that we can get more out of them by rebalancing investment in their availability and Next Generation Protector RG Mk 1 UAV will offer increased sustainment. In the first wave of projects, we are focused on maximising the return on our investment in the new Type 31 frigate, our Typhoon aircraft and our Challenger 2 tanks—as well as setting ourselves up for bringing Challenger 3 into service.<sup>375</sup>

**The U.K.’s *Defence Equipment Plan 2022–2032* details spending of £242 billion (approximately \$298 billion) across 10 years.<sup>376</sup> Navy Command will receive £41.1 billion; Army Command, £40.6 billion; Air Command, £35.1 billion; Strategic Command, £36.3 billion; the Defence Nuclear Organisation, £59.7 billion; and the combined Strategic and Combat Air Programmes, £23.7 billion.<sup>377</sup> The MOD estimates total costs across the decade at £240 billion, therefore allowing £2.6 billion in “headroom.”<sup>378</sup>**

**According to the National Audit Office:**

The Department (MOD) has assessed that the Plan is affordable over the period 2022–2032. This is based on financial data from March 2022 and reflects ongoing improvements to its affordability assessment. However, its assessment continues to be based on optimistic assumptions that it will achieve all planned savings. It will also take some important decisions that affect the Plan’s costs in the next financial planning round. While the Plan continues to serve a useful purpose in reporting to Parliament on planned expenditure, the volatile external environment means this year’s Plan is already out of date.<sup>379</sup>

Although the number of its active-duty service-members is small in comparison to the militaries of France and Germany, the U.K. maintains one of NATO's most effective armed forces, but underinvestment, particularly in land forces, has eroded these capabilities. In January 2023, a senior U.S. general reportedly told U.K. Defence Secretary Ben Wallace that "the British Army is no longer regarded as a top-level fighting force."<sup>380</sup>

The Army's Future Soldier plan, published in November 2021, "aims to achieve the most 'radical transformation' of the British Army in 20 years by delivering a fully modernized warfighting division by 2030, largely dependent on entry to service of Challenger 3 main battle tanks, Ajax armored fighting vehicles and Boxer wheeled, armored personnel carriers." However, there is concern that "the recent acquisition record of the service, beset by gross overspending, program cancellations, industrial disputes and equipment not entering service in line with original timeline projections, puts the 2030 target in jeopardy."<sup>381</sup> The plan envisions reducing the regular Army from 77,000 to 73,000 by 2025, but Wallace has been quoted as saying, "I've always said as the threat changes, so must the size of everything, and I still stick to that."<sup>382</sup>

In early 2021, the Defence Ministry announced that it had been granted observer status for the Franco-German Main Ground Combat System program, which is slated to replace French and German main battle tanks "around 2035."<sup>383</sup> In April 2019, the U.K. reported that it was planning to upgrade only 148 of its 227 remaining Challenger IIs, cutting its fleet by one-third.<sup>384</sup> The 79 other tanks would be scavenged for spare parts.<sup>385</sup> Defence Secretary Wallace has stated that more tanks will be modernized in light of Russia's war in Ukraine, but exactly how many additional tanks will be upgraded is unclear.<sup>386</sup> Because Challengers are not currently manufactured, sourcing spare parts is a major problem.<sup>387</sup>

The 2021 Defence Command Paper laid out plans to spend £1.3 billion on upgrades to "148 of our main battle tanks to ensure the Challenger III will become one of the most protected and most lethal in Europe."<sup>388</sup> The Challenger III's upgrade is to include "active protection systems, improved sensors and optics, and a new turret."<sup>389</sup> Production of the Challenger IIIs began in March 2022, and initial operating capability is expected in 2027.<sup>390</sup> The tank will remain in service "until at least 2040."<sup>391</sup>

Of the 227 Challenger IIs in the Army's current inventory, only 157 could undertake operations within 30 days.<sup>392</sup> One former tank officer has observed that because of the small number of tanks available to the U.K., its "armoured brigades can only play a bit part in someone else's military in alliance or coalition."<sup>393</sup>

In March 2021, the U.K. announced that it would no longer upgrade its Warrior armored vehicles but that they would remain in service through the mid-2020s.<sup>394</sup> In 2019, the U.K. signed a £2.8 billion deal to procure 523 Boxer armored vehicles.<sup>395</sup> As a result of the decision to stop upgrading the heavier Warriors, "Defence is considering further Boxer fleet enhancements, uplifts, and potential new variants for a number of programmes for capability coherence in the Brigade Combat Teams, Land Industrial Strategy opportunity, and longer-term strategic planning."<sup>396</sup> In 2022, the Army signed a contract extension for 100 additional Boxers (for a total of 623) with the first units expected to enter service in 2023.<sup>397</sup> The Ajax infantry fighting vehicle platform has begun to move again after an eight-year delay. The first squadron will receive the Ajax by the end of 2025, but vehicles will not obtain full operating capability until 2028 or later.<sup>398</sup>

As of March 2023, the U.K. had taken delivery of 30 of 48 F-35Bs ordered with delivery of seven more possible by the end of the year and 11 more to be delivered across 2024 and 2025.<sup>399</sup> Although the total number of F-35s that will be procured may not be known until "the 2025 time frame,"<sup>400</sup> the 2021 Defence Command Paper states an ambition to "grow the [F-35] Force, increasing the fleet size beyond the 48 aircraft that we have already ordered."<sup>401</sup> In December 2022, the MOD reiterated its commitment to procuring a total of 138 F-35s.<sup>402</sup>

In 2019, the U.K. took delivery of the last of 160 Typhoon aircraft, all of which are expected to stay in service until 2040.<sup>403</sup> In January 2023, BAE Systems told Parliament that upgrading the U.K.'s remaining 30 Tranche 1 Typhoons to bring them "up to a standard where they could be retained in service rather than retired in 2025, as currently planned," is "technically feasible." The planes "have an average of 60% of their airframe fatigue lives remaining" but are slated to be retired in 2025.<sup>404</sup>

Project Centurion, a \$515.83 million Typhoon upgrade to integrate additional Storm Shadow long-range cruise missiles and Brimstone precision



attack missiles, was completed in 2018 and enabled the U.K. to retire its fleet of Tornado aircraft.<sup>405</sup> In 2021, the U.K. detailed a £2 billion investment over the next four years to develop the Tempest, a sixth-generation fighter to be delivered in 2035, in partnership with Italy, Japan, and Sweden.<sup>406</sup> In December 2022, the U.K., Italy, and Japan announced an agreement to cooperate on development of a sixth-generation fighter aircraft under the Global Combat Air Programme, which would essentially merge the Tempest effort with Japan's F-X program.<sup>407</sup>

Along with the U.K., the U.S. has produced and jointly operated an intelligence-gathering platform, the RC-135 Rivet Joint aircraft, which has seen service in Mali, Nigeria, and Iraq and is now part of the RAF fleet.<sup>408</sup>

The U.K. operates seven C-17 cargo planes and has started to bring the European A400M cargo aircraft into service after years of delays. It has taken delivery of 21 of 22 A400M heavy transport aircraft ordered and plans to procure six more by 2030.<sup>409</sup> The U.K. has retired four of 14 C-130Js with the remainder to be retired in 2023 rather than 2025. The decision to retire the C-130J—an aircraft favored by special forces—12 years ahead of schedule has drawn criticism from some lawmakers and military personnel. RAF Deputy Commander Capability Air Marshal Richard Knighton testified in February 2023 that “[t]here are a small number of niche capabilities that the C-130J has that will not be transferred across to the A400M program at the point in which the C-130 is retired in the summer [of 2023].” Whether the A400M has the ability to take on these niche capabilities, which include the need for longer runways, remains a matter of concern.

The Sentinel R1, an airborne battlefield and ground surveillance aircraft, flew its last operational flight in February 2021.<sup>410</sup> In January 2021, “[t]he ninth and final Poseidon maritime patrol aircraft—ZP809—[was] delivered to RAF Lossiemouth in Scotland.”<sup>411</sup> In 2018, retired Air Vice-Marshal Andrew Roberts testified to Parliament that “capable though the P-8 may be, the number of aircraft planned is undoubtedly inadequate to fulfil even the highest priority tasks likely to be assigned to the force in tension and hostilities.”<sup>412</sup> The P-8s are expected to obtain full operating capability at the end of 2024.<sup>413</sup>

The U.K. is replacing its MQ-9A reaper fleet with 17 MQ-9B “protector” drones.<sup>414</sup> The MQ-9Bs were slated to enter service by 2018 but were delayed by budgetary issues;<sup>415</sup> the U.K. accepted the first in October 2022.<sup>416</sup> The U.K. also plans to procure approximately 44 medium helicopters (a \$1.15 billion program) that will enter service in 2025 and remain in service until the mid-2040s. This platform will replace four different helicopter platforms currently in service.<sup>417</sup>

The Royal Navy has lost 40 percent of its fleet since the end of the Cold War.<sup>418</sup> Of the 55 ships lost since the early 1980s, half are frigates, and the U.K. now operates only 12.<sup>419</sup> Overall:

Budget cuts have delayed crucial procurement programmes. The Type 23 frigates and Trafalgar class submarines should have been replaced years ago, and it is becoming increasingly challenging and expensive to maintain aging vessels. The Navy has also taken too long to rectify major problems with vessels. One notable example is the issue with the Type 45 destroyers' propulsion system: the six vessels are not scheduled to be fixed until 2028, and there are already signs that this target may be slipping. As a result of these failures too many of our high-end warships spend too much of their time unavailable for operations.<sup>420</sup>

**As construction of destroyers and frigates picks up steam, “the ambition is to rebuild to more than 20 by the end of the decade.”<sup>421</sup> However:**

The mid-2020s will be a period when the [Royal Navy] must endure an unavoidable low point in strength before it recovers in the early 2030s. There are three main factors that drive this, two of them rather beyond the RN's immediate control. Firstly the backbone of the surface fleet, the Type 23s, are getting older and fewer in number. Secondly, the carrier strike project is some way from reaching its full potential mainly due to the slow delivery of F-35s, a constrained pilot training pipeline and obstacles to the integration of key air weapons. Finally, ship numbers are declining while the RN transitions to autonomous systems that are not yet fully mature or proven on operations.<sup>422</sup>

The Royal Navy's surface fleet is based on the new Type-45 destroyer and the older Type-23 frigate. The latter will be replaced by eight Type-26 Global Combat Ships, the first of which is "expected to enter service in the mid-2020s."<sup>423</sup> The Type-26 Global Combat Ships are meant to handle a flexible range of tasks; weaponry will include "the Sea Ceptor missile defence system, a 5-inch medium calibre gun, flexible mission bay, Artisan 997 Medium Range Radar, and towed array sonars" as well as "the Future Cruise/Anti-Ship Weapon (FCASW) from 2028."<sup>424</sup> In September 2021, construction began on the HMS *Venturer*, the first of five T31e frigates that are scheduled for delivery by 2028.<sup>425</sup> One of the U.K.'s oldest Type-23 frigates, HMS *Monmouth*, was retired early at the end of 2021, and a second, HMS *Montrose*, was retired in March 2023, bringing the U.K.'s frigate fleet down to 11.<sup>426</sup> The projected savings of £100 million (\$133 million) "will be invested into the development of the follow-on capabilities of the Type 26 anti-submarine warfare frigate and Type 31 general purpose frigate."<sup>427</sup>

From May 2021–December 2021, the HMS *Queen Elizabeth* conducted its first operational deployment, which included time in the Mediterranean Sea and the Indian and Pacific Oceans "working alongside ships from 17 countries and participating in 18 major exercises."<sup>428</sup> The Carrier Strike Group deployment included a U.S. destroyer and a Dutch frigate, and "[t]he F35B contingent aboard HMS Queen Elizabeth undertook 1,278 sorties...with more than 2,200 hours of flying, including 44 combat missions in support of Operation Inherent Resolve against the Islamic State (ISIS) in Iraq and Syria."<sup>429</sup> In November, the Carrier Strike Group took part in interoperability exercises with Italian F-35Bs.

According to Commodore Steve Moorhouse, commander of the U.K. Carrier Strike Group, "[t]he fact that US, Italian, and UK F-35Bs are able to fly to and from one another's decks offers tactical agility and strategic advantage to NATO."<sup>430</sup> International Institute for Strategic Studies (IISS) Senior Fellow for Naval Forces and Maritime Security Nick Childs noted that "[f]or the Royal Navy, this was in part a relearning of the lessons of large-scale carrier deployments after a decade-long gap in its operational carrier capability." Additionally:

A significant part of this will have been the exercises with multiple US carriers and aviation-capable amphibious ships to calibrate the added value of a UK carrier, and perhaps also to test how best to mitigate the relatively low endurance of the F-35B, particularly as far as the potential operational challenges in the Indo-Pacific theatre are concerned.<sup>431</sup>

The U.K.'s *Queen Elizabeth*-class carriers are the largest operated in Europe. A second, HMS *Prince of Wales*, was commissioned in December 2019.<sup>432</sup> A series of leaks that cost £3.3 million to correct caused the cancellation of planned fixed-wing sea trials with F-35s off the U.S. east coast that were scheduled for January 2021; the *Prince of Wales* returned to the sea in May 2021 after five months of repairs.<sup>433</sup> In September 2022, Forces.net reported that the *Queen Elizabeth* "can carry up to 72 aircraft, with a maximum capacity of 36 F-35B fighter jets" but that "[i]t is more likely the Queen Elizabeth-class carriers will have up to 24 Lightning jets on board for operations."<sup>434</sup>

In March 2022, the *Prince of Wales* led NATO's Maritime High Readiness Force, serving as command ship for Exercise Cold Response in which 35,000 troops from 28 nations converged in Norway and the surrounding seas through April for cold-weather exercises.<sup>435</sup> In August 2022, the carrier was forced to leave exercises with the U.S. early after breaking down off the southern U.K. coast.<sup>436</sup> It arrived in dry-dock for repairs in October 2022. Repair costs have soared from an estimated £3 million to £20 million, but a spokesman for the Royal Navy has said that "[w]e expect HMS *Prince of Wales* to commence her operational program as planned, in autumn 2023."<sup>437</sup>

The Royal Navy is also introducing seven *Astute*-class attack submarines (SSNs) as it phases out its older *Trafalgar*-class subs. The fifth *Astute*-class submarine, HMS *Anson*, was launched in April 2021.<sup>438</sup> In March, the U.S., the U.K., and Australia announced that Australia's SSN "will be based upon the United Kingdom's next-generation SSN design while incorporating cutting edge U.S. submarine technologies, and will be built and deployed by both Australia and the United Kingdom."<sup>439</sup> Reflecting its close ties with Australia, the U.K. "agreed to provide training to Royal Australian Navy submariners alongside Royal Navy crews on board the HMS *Anson* in September 2022."<sup>440</sup>

The U.K. maintains a fleet of 13 Mine Counter Measure Vessels (MCMVs) that deliver world-leading capability. As a supplement, the U.K. began minehunting and survey operations using unmanned surface vessels (USVs) in March 2020.<sup>441</sup> In February 2022, the U.K. ordered a fifth ATLAS Remote Combined Influence Minesweeping System.<sup>442</sup> A newly purchased “mother ship to launch drones to find and destroy undersea threats” was “intended to enter service in Spring 2023.”<sup>443</sup>

Perhaps the Royal Navy’s most important contribution is its continuous-at-sea, submarine-based nuclear deterrent based on the *Vanguard*-class ballistic missile submarine and the Trident missile. In July 2016, the House of Commons voted to renew Trident and approved the manufacture of four replacement submarines to carry the missile. The U.K.’s 2021 Integrated Review announced plans to raise the ceiling on the nation’s nuclear warhead stockpile to “no more than 260 warheads” because of “the developing range of technological and doctrinal threats.”<sup>444</sup> In November 2022, the U.S. Navy published “an exceptionally rare picture showing the *Ohio*-class ballistic missile submarine USS *Tennessee*, sailing on the surface alongside an unnamed British *Vanguard* class ballistic missile submarine somewhere in the Atlantic Ocean.” *Vanguard* subs “regularly travel to the U.S. Navy’s ranges in the Atlantic off Florida for training and other purposes, including to conduct routine test launches of Trident D5 missiles.”<sup>445</sup>

The U.K. is procuring four new *Dreadnought*-class ballistic missile submarines—HMS *Dreadnought*, HMS *Valiant*, HMS *Warspite*, and HMS *George VI*—at a cost of “£31bn (USD42bn) with a further contingency of £10bn (USD13.6bn).<sup>446</sup> The first, HMS *Dreadnought*, “is expected to enter service in the 2030s with a service life of a minimum of 30 years.” Construction of HMS *Dreadnought* began in October 2016, “[t]he keel for *Valiant* was laid in 2019,” and “[t]he steel-cutting ceremony for *Warspite* was held...in February 2023.”<sup>447</sup> In May 2021, the Ministry of Defence ordered a review of the program because of delays that continue to push back the date of completion.<sup>448</sup>

Despite these issues, the U.K. remains a leader in NATO, serving as the framework nation for NATO’s EFP in Estonia and a contributing nation for the U.S.-led EFP in Poland with 140 troops.<sup>449</sup> In February 2022, the U.K. announced that it was doubling

its troop presence in Estonia by deploying an additional battlegroup, swelling the U.K. contribution to more than 1,700 troops along with 48 Warrior Infantry Fighting Vehicles and 24 Challenger II main battle tanks.<sup>450</sup> However, the second battlegroup returned to the U.K. in December 2022 and was not replaced this year. Instead, “the UK will hold at high readiness the ‘balance of a Brigade’ in the UK, available to deploy if needed” and “will also ‘surge’ forces throughout the year for exercises, enhance its headquarters and provide support to Estonian armed forces.”<sup>451</sup>

In December 2021, the U.K. deployed 140 armed forces engineers to Poland “to provide support at [Poland’s] border with Belarus, where the West says Minsk is orchestrating an ongoing migrant crisis.”<sup>452</sup> In February 2022, it sent 350 Marines “to support the Polish Armed Forces with joint exercises, contingency planning and capacity building in the face of ongoing tensions on the Ukrainian border. This support is being offered on a bilateral basis and is not part of the UK’s offer to NATO.”<sup>453</sup> The U.K. is committed to leading NATO’s VJTF in 2024. The VJTF’s “leadership position is rotated among members to share the burden that it places on the military, and brigades are bound to the VJTF for three years to help with the stand-up, stand-by and stand-down phases, meaning they are not available for other missions or international obligations.”<sup>454</sup>

The Royal Air Force has taken part in Baltic Air Policing seven times since 2004, most recently beginning in March 2023.<sup>455</sup> In March 2022, four RAF Typhoons were deployed to Romania to take part in NATO’s enhanced Air Policing, the fourth time the RAF has participated in eAP since 2017.<sup>456</sup> That same month, the RAF announced that F-35s flying from RAF Marham were taking part in patrols of Polish and Romanian airspace as part of NATO’s enhanced Vigilance Activity.<sup>457</sup> From November 2019–December 2019, four U.K. typhoons and 120 personnel took part in Icelandic Air Policing.<sup>458</sup>

Before its withdrawal early in 2021, the U.K. maintained a force of 750 troops in Afghanistan as part of NATO’s Resolute Support Mission.<sup>459</sup> It also contributes to NATO’s Kosovo Force;<sup>460</sup> is an active part of the anti-ISIS coalition “as part of Operation Shader, the UK’s military contribution to the destruction of Daesh which has been running since 2014”;<sup>461</sup> and has 100 soldiers engaged in training Iraqi security forces.<sup>462</sup>

**Italy.** Italy hosts some of the U.S.'s most important bases in Europe, including the headquarters of the 6th Fleet. It also has NATO's fifth-largest military<sup>463</sup> and one of its more capable (a relative measure) despite continued lackluster defense investment. In 2022, Italy spent 1.51 percent of its GDP on defense and 22.69 percent of its defense budget on equipment, meeting the second NATO spending benchmark.<sup>464</sup> Current Prime Minister Giorgia Meloni "has vowed to drop Italy's traditional reticence about discussing defense spending and boost budgets" because "[f]reedom has a price and if you are not able to defend yourself, someone else will do it for you, but will not do it for free. They will impose their interests, even if they differ from yours, and I don't think this was ever good business for anyone."<sup>465</sup> The new government raised the defense procurement budget from €7.85 billion to €8.25 billion.<sup>466</sup> The Defense Ministry's planning document for 2022–2024, released in July 2022, "anticipates that Rome will reach the current NATO average of 1.64 percent by 2024, inflation permitting."<sup>467</sup>

Italy spends the alliance's second-highest total on salaries (62 percent of its defense budget),<sup>468</sup> "leaving proportionally less cash for military procurement, training, maintenance and infrastructure."<sup>469</sup> It has been noted that "[h]igh personnel expenditure is partly linked to the limited generational change within the armed forces. In 2020, for instance, the average age in the Italian Army was 38 and 44 for the air force. By contrast, the average age is 31 in the U.K. military and 33 in both France's armed forces and the Bundeswehr's."<sup>470</sup>

Recruitment difficulties have led to personnel shortages, particularly in the Navy, a service that also suffers from "a shortage of vessels" and "capability gaps in key areas such as anti-submarine warfare and land-attack missiles."<sup>471</sup> For instance, "Navy chief Adm. Enrico Credendino told lawmakers his force lacked drones and submarine-spotting aircraft, complaining that 'When we need one we ask the U.S. to use one of those it has stationed at Sigonella,'" and that "Italian naval performance was hampered by a lack of personnel, claiming that while France provided each of its FREMM frigates with two rotating crews, 'We cannot guarantee one full crew for any of our FREMMs."<sup>472</sup>

Key naval procurements include plans for four U212A submarines, the first of which is scheduled for delivery in May 2030; a "Special Diving

Operations–Submarine Rescue Ship (SDO–SuRS)"; and the Teseo Mk2/E anti-ship missile, which is in development.<sup>473</sup> The U212A project passed a design review in March that "validates the final design of the underwater vessel, demonstrating that it is mature and fully compliant with specific mission requirements."<sup>474</sup>

Italy launched the last of 10 new FREMM frigates in January 2020. Its Landing Helicopter Dock (LHD) Trieste is expected to be delivered this year and "although classified as an LHD...will effectively be Italy's second aircraft carrier, featuring a ski jump that allows the ship to operate the Lockheed Martin F-35B."<sup>475</sup>

The Italian Navy is planning major capabilities expansions that include:

7 PPA medium frigates of the Thaon di Revel class, 8 corvettes of 3000 tons from the European Patron Corvette program, 4 Offshore Patron Vessel of 1500 tons of the Comandanti class, 10 mine warfare ships, as well as 3 large logistics ships of the Vulcano and Etna classes. In addition, it will have 8 to 12 Type 212 anaerobic conventionally powered submarines, and 4 destroyers, two of the 7000-ton Horizon class already in service, identical to the 2 French Forbin-class anti-aircraft defense frigates, and especially two new heavy destroyers over 10,000 tons which will replace the two Durand de la Penne anti-aircraft destroyers.<sup>476</sup>

Scheduled to be delivered by 2028, the DXX destroyers, "[w]ith a length of 175 meters, and a displacement of nearly 11,000 tons...will be the largest surface combatants built in Europe."<sup>477</sup>

Air Force procurements include (among others) T-345 and T-346 jet trainers; three MC-27J Praetorians for support of special forces; and three EC-27J JEDI (Jamming and Electronic Defense Instrumentation) electronic warfare aircraft with capabilities that "are intended for the execution of convoy escort missions where it provides from the air an electromagnetic safety bubble."<sup>478</sup> In November 2022, Italy announced a €1.12 billion program to purchase six new KC-767B/KC-46A tankers to replace its KC-767A fleet beginning in 2023 and continuing through 2035.<sup>479</sup>

As of March 2023, Italy had received 17 F-35As and six F-35Bs "of the 90 aircraft currently on

order,” with the last to be delivered by 2030.<sup>480</sup> Italian Air Force Chief of Staff General Luca Goretti has urged a return to the initial purchase number of 131, which “was cut [in 2012] by 30 percent, from 131 to 90 ‘as a consequence of the general economic situation, rather than as a result of scientific military analysis.’”<sup>481</sup> A government-owned plant for final assembly of the F-35 is located in Cameri, Italy. Italy now operates two bases with F-35s: Amendola, north of Bari along the Adriatic, and Ghedi in northern Italy outside Milan.<sup>482</sup>

Italy will continue funding for development of the Eurodrone in conjunction with France, Germany, and Spain. It also “plans to arm its MQ-9 Reaper drones with upgrades from the United States” and reportedly has expressed interest in acquiring Turkish-made drones for surveillance.<sup>483</sup>

In December 2020, Italy signed the Future Combat Air System (FCAS) Cooperation agreement with Sweden and the U.K. The agreement covers “cooperation for research, development, and ‘joint-concepting’ of the Tempest fighter which will eventually replace the Eurofighter Typhoon fighter jets in Italy and the UK, and the Saab Gripen fighter jets in Sweden.”<sup>484</sup> In December 2022, Japan announced “that it will jointly develop its next-generation fighter jet with the U.K. and Italy as it looks to expand defense cooperation beyond its traditional ally, the United States.”<sup>485</sup> In March 2023, the leaders of Italy, Japan, and the U.K. “confirmed their commitment to achieve the fighter jet deployment by 2025.”<sup>486</sup>

Key Army procurements include the planned acquisition of 150 Centauro II tank destroyers, 650 Lince 2 light multi-role vehicles, VBM Freccia 8x8 infantry combat vehicles, and upgrades to the Ariete main battle tank (MBT). The Army plans to upgrade 125 Ariete MBTs, extending their operational timeline to 2040, but analysts have noted that not enough money has been allocated to upgrade all 125. Because of inadequate funding, other non-priority Army acquisition projects are not likely to come into service until the end of the decade.<sup>487</sup> The Army began trials of the upgraded Ariete MBT in July 2022.<sup>488</sup> However, despite these planned upgrades, Italian defense planners reportedly “envisage a current need for 250 main battle tanks, of which 125 could be upgraded Ariete tanks, leaving a need for 125 gap fillers.”<sup>489</sup>

Italy’s focus is the Mediterranean region where it participates in a number of stabilization missions

including NATO’s Sea Guardian, the EU’s Operation Iriini and Operation Atalanta, and the Italian Navy’s own Operation Mare Sicuro (Safe Sea) off the Libyan coast.<sup>490</sup> Additionally, 400 Italian troops are deployed to Libya as part of the Assistance and Support Bilateral Mission in Libya (MIASIT).<sup>491</sup>

Italy also contributes to Standing NATO Maritime Group Two and Standing NATO Mine Countermeasures Group Two;<sup>492</sup> NATO battlegroups in Bulgaria, where Italy is the framework nation (750 troops), Hungary (250 troops), and Latvia (260 troops); and Operation Prima Parthica in Iraq and Kuwait (650 troops, partly to help train Iraqi Security Forces).<sup>493</sup> Italian air assets including Tornado jets operating out of the Ahmed Al Jaber air base in Kuwait are performing reconnaissance missions in support of the coalition to defeat the Islamic State.<sup>494</sup> With 564 troops, Italy was the third-largest contributor to KFOR, behind the United States (768) and Germany (743), as of April 2023.<sup>495</sup> In March 2022, it was reported that Italy intended to send two mine countermeasures vessels to Romania “to assist with the recently found drifting sea mine threat.”<sup>496</sup>

Since 2015, “Italian jets...have regularly deployed to support NATO’s Baltic Air Policing mission out of Lithuania and Estonia,” and in August 2022, “Italian Air Force Eurofighters officially took up the mission of safeguarding NATO’s skies above the Baltic region flying out of Malbork, Poland.”<sup>497</sup> From December 2022–July 2023, the Air Force once again took part in NATO’s enhanced Air Policing in Romania with four Typhoons,<sup>498</sup> and from April–July 2022, four F-35As and 130 troops were deployed to Iceland.<sup>499</sup>

**Poland.** Situated in the center of Europe, Poland shares a border with four NATO allies, a long border with Belarus and Ukraine, and a 130-mile border with Russia’s Kaliningrad Oblast, a Russian enclave between Poland and Lithuania on the Baltic Sea that Poland is trying to secure against Russian-facilitated illegal border crossings by building a “temporary barrier.”<sup>500</sup> Poland also has a 65-mile border with Lithuania, the only land connection linking NATO’s Baltic members with any other NATO member. NATO’s contingency plans for liberating the Baltic States in the event of a Russian invasion reportedly rely heavily on Polish troops and ports.<sup>501</sup>

Poland is ground zero for supplies and military equipment from Western allies reaching Ukraine.

Currently, “as many as 10 Boeing 747 jumbo jets carrying cargo land and take off during a single day, on top of regular commercial traffic” at the Rzeszow airport in the country’s East. The city may have 30,000 more residents than it had before Russia’s full-scale invasion of Ukraine began, and the U.S. has deployed Patriot missile batteries at the airport, underscoring its importance.<sup>502</sup>

Poland has an active military force of 114,050 that includes a 58,500-person army with 647 MBTs.<sup>503</sup> It also has a Territorial Defense Force (TDF) that, according to former Minister of Defense Antoni Macierewicz, is intended “to increase the strength of the armed forces and the defense capabilities of the country” and is “the best response to the dangers of a hybrid war like the one following Russia’s aggression in Ukraine.”<sup>504</sup> The TDF is mostly volunteer; “its personnel combine their civilian careers with limited military service of a minimum of two days twice a month and an annual two-week camp.”<sup>505</sup> Its planned 17 brigades will be distributed across the country.<sup>506</sup>

The TDF, which currently numbers 36,000, is planned to reach a minimum strength of 50,000<sup>507</sup> and is “the fifth single service in the Polish Armed Forces next to Land Forces, Air Force, Navy and Special Operations Forces” and “an integral part of Poland’s defence and deterrence potential.”<sup>508</sup> National Defence Minister Mariusz Blaszczak has stated that during the COVID-19 pandemic, the TDF “impeccably proved their importance and effectiveness.”<sup>509</sup> According to Blaszczak, Poland plans to “increas[e] the army’s size to at least 300,000 soldiers, supported by a 50,000-strong territorial defence force,” and the 13,742 Poles who joined in 2022 constitute “the highest enrolment...since Poland abolished conscription in 2008.”<sup>510</sup>

Poland is investing in cyber capabilities. Its new Cyberspace Defense Force was established in February 2022 with a mission of “defense, reconnaissance and, if need be, offensive actions to protect Poland’s Armed Forces from cyberattacks.”<sup>511</sup> In November 2020, the U.S. and Poland signed an enhanced defense cooperation agreement that increased the number of U.S. forces stationed in Poland. The U.S. further expanded its footprint in 2022 following Russia’s second invasion of Ukraine.

In 2022, Poland spent 2.42 percent of GDP on defense and 35.92 percent of its defense budget on equipment, surpassing both NATO benchmarks.<sup>512</sup>

Poland’s 2020 National Security Strategy accelerated the timeline for spending 2.5 percent of GDP on defense from 2030 to 2024.<sup>513</sup> In January 2023, Prime Minister Mateusz Morawiecki announced that Poland would raise defense spending to 4 percent of GDP in 2023—a “decision, against the background of Russia’s war in Ukraine, [that] would see the country spending even more as a proportion of its economy than the United States.”<sup>514</sup>

In October 2022, Poland and the U.K. “signed a series of agreements to move forward on military collaboration, as the Ukraine conflict continues to drive home the necessity of European co-development efforts.” The agreements include an Air Defence Complex Weapons Memorandum of Understanding that “enables the UK and Poland to cooperate in the development and manufacture of current and future complex weapons” and approves the creation of a working group to “explore the potential for the UK and Polish Armed Forces to cooperate on the development of a Future Common Missile.” The countries also signed a Statement of Intent “to collaborate on the procurement and operation of three Miecznik frigates, which will be a variant of the Arrowhead-140 frigates.”<sup>515</sup>

Poland is making major investments in military modernization and is planning to spend \$133 billion on new capabilities by 2035 as envisioned in the Defense Ministry’s Technical Modernization Plan for 2021–2035, which was signed in October 2019.<sup>516</sup> Several major acquisitions have been announced in recent years. For example:

- In February 2018, Poland joined an eight-nation “coalition of NATO countries seeking to jointly buy a fleet of maritime surveillance aircraft.”<sup>517</sup>
- In March 2018, in the largest procurement contract in its history, Poland signed a \$4.75 billion deal for two Patriot missile batteries. The first was delivered in 2022, and delivery of the second is expected in 2023. The batteries are being deployed at Bemowo military airport in Warsaw, and troops are training on the systems, “which are set to achieve operational readiness in 2024.”<sup>518</sup> In May 2022, Defense Minister Mariusz Blaszczak announced that Poland had “request[ed] the U.S. government to sell it six Patriot batteries with related gear.”<sup>519</sup>

- In February 2019, Poland signed a \$414 million deal to purchase 20 high-mobility artillery rocket systems (HIMARS) from the U.S.,<sup>520</sup> and in February 2023, it was reported that “[t]he first HIMARS battalion firing module is set to arrive this year.”<sup>521</sup> In May 2022, Defence Minister Blaszczak sent a letter of request to purchase an additional 500 HIMARS systems from the U.S.<sup>522</sup>
  - In April 2019, Poland signed a \$430 million deal to buy four AW101 helicopters that will provide anti-submarine warfare and search-and-rescue capabilities. Delivery of the first helicopter has been delayed until the second half of 2023.<sup>523</sup>
  - In April 2020, it was announced that Poland had concluded negotiations for the purchase of 60 Javelin Command Launch Units (CLUs) and 180 Javelin anti-tank missiles.<sup>524</sup> In January 2023, Poland exercised an option to order an additional 50 CLUs and 500 missiles, deliveries to be completed by 2026.<sup>525</sup> The original FMS contract and the option together are worth \$158 million.<sup>526</sup>
  - In January 2020, Poland signed a \$4.6 billion deal to purchase 32 F-35As, “with initial deliveries beginning in 2024 and in-country deliveries from 2026,” to be based at Poland’s Lask Air Base. A group of 24 Polish pilots completed F-35 simulator training in Arizona early in 2021.<sup>527</sup> Polish pilots will be the first foreign pilots to train at the newly designated Air Force foreign pilot training center at Ebbing Air National Guard Base in Fort Smith, Arkansas, possibly as early as late 2024.<sup>528</sup>
  - In April 2021, the U.S. and Poland signed an agreement for Poland to acquire five retrofitted C-130H Hercules transport aircraft by 2024 with the first arriving in 2021 and the second in 2022.<sup>529</sup>
  - In July 2021, Poland announced a deal to procure 250 M1A2 Abrams SEPv3 tanks with deliveries “expected to begin in 2022.”<sup>530</sup> In January 2023, Poland signed a \$1.4 billion contract to procure an additional “116 M1A1 Abrams tanks with related equipment and logistics starting this year.”<sup>531</sup>
  - In September 2022, Poland received the first of two Narew short-range air defense system (SHORAD) launchers, originally scheduled for delivery in 2027. The earlier delivery was “prompted by Russia’s invasion of Ukraine.”<sup>532</sup>
  - In September 2022, Poland’s Ministry of National Defence sent a letter of request to the U.S. for the purchase of “96 Boeing AH-64E Apache attack helicopters.”<sup>533</sup>
  - In February 2023, the U.S. State Department approved a \$10 billion sale to Poland that “covers 18 M142 High Mobility Artillery Rocket System, or HIMARS, launchers and 468 launcher-loader module kits” in addition to “45 M57 Army Tactical Missile Systems, known as ATACMS, and hundreds of guided multiple launch rocket and warheads variants.”<sup>534</sup>
  - Poland has signed agreements to purchase 48 Korean Aerospace FA-50 light combat fighter jets, 180 Hyundai Rotem K2 Black Panther Tanks, and 212 Hanwha K9A1 self-propelled artillery from South Korea.<sup>535</sup> Poland plans to acquire “more than 800 of the K2PL variant of the tank, production of which starts in Poland in 2026,” and an additional 600 K9 howitzers “with domestic production expected to start in 2026.”<sup>536</sup> The first 10 tanks and 24 howitzers were delivered to Poland in December 2022.<sup>537</sup>
- Poland’s Air Force has taken part in Baltic Air Policing 11 times since 2006, most recently operating four F-16s out of Šiauliai Air Base in Lithuania from October 2022–March 2023.<sup>538</sup> From August–October 2021, four Polish F-16s and 140 troops took part in Icelandic Air Policing, marking the first time that Poland has taken part in that mission.<sup>539</sup>
- In 2020, Poland was the lead for NATO’s VJTF, and approximately half of the 6,000 troops in the VJTF’s Spearhead Force were Polish.<sup>540</sup> Poland also is part of NATO’s EFP in Latvia and Romania<sup>541</sup> and has 230 troops in NATO’s KFOR mission in Kosovo.<sup>542</sup> In addition, 150 troops are deployed to Iraq, Jordan, Kuwait, and Qatar as part of Operation

Inherent Resolve, and 30 are deployed as part of NATO Mission Iraq.<sup>543</sup> In 2021, 80 Polish soldiers deployed to Turkey as part of a NATO assurance mission to assist Turkey by providing additional maritime patrols over the Black Sea and the Mediterranean.<sup>544</sup>

**Turkey.** Turkey remains an important U.S. ally and NATO member, but autocratic President Recep Tayyip Erdogan's delays in considering Sweden's NATO membership,<sup>545</sup> Turkey's purchase of S-400 air defense systems from Russia, and Turkey's becoming a haven for illicit Russian money to evade Western sanctions have strained relations. At the same time, Turkey's support for Ukrainian forces has included its February 2022 closure of the Bosphorus and Dardanelles Straits to warships of any nation, thereby hampering the Russian Black Sea Fleet;<sup>546</sup> facilitation of a deal for the safe export of Ukrainian grain via the Black Sea; and providing the Bayraktar TB2 drone that has proven to be so effective on the battlefield.<sup>547</sup> So close has the relationship become that in October 2022, Baykar announced it would complete a production facility for the drone in Ukraine within two years.<sup>548</sup>

Turkey has been an important U.S. ally since the closing days of World War II. During the Korean War, it deployed 15,000 troops and suffered 721 killed in action and more than 2,000 wounded. Turkey joined NATO in 1952, one of only two NATO members (the other was Norway) that had a land border with the Soviet Union. It continues to play an active role in the alliance, but not without difficulties.

Following an attempted coup in July 2016, thousands of academics, teachers, journalists, judges, prosecutors, bureaucrats, and soldiers were fired or arrested. As of July 2022, 332,884 people had been detained, and the government continues to jail opposition politicians and civil society leaders. The government is also pursuing an ambitious program of prison construction and "is planning to build 20 new prisons [in 2023], which is expected to significantly increase the country's already high incarceration rate."<sup>549</sup>

The post-coup crackdown has had an especially negative effect on the military. At the end of 2021, 24,253 military personnel had been dismissed,<sup>550</sup> and military promotions have been politicized. In the words of one military officer:

[T]he power in the promotion and appointment of admirals and generals passed from the military bureaucracy to Erdoğan's government. The changes led to the politicization of the military and undermined its independence. The new system favors officers loyal to the Erdoğan government rather than those best qualified and experienced.<sup>551</sup>

Turkey's military is now suffering from a loss of experienced generals and admirals as well as an acute shortage of pilots. The dismissal of 680 of 1,350 pilots greatly exacerbated existing pilot shortages.<sup>552</sup> In September 2022, it was reported that the "Turkish Ministry of Defence requested that the 15-year limit for mandatory service of pilots be extended to 21, so as to reduce the shortage of combat pilots."<sup>553</sup>

The dilapidated condition of its air force is partly why Turkey has decided to acquire new ground-based air defense systems.<sup>554</sup> In December 2017, Turkey signed a \$2.5 billion agreement with Russia to purchase two S-400 air defense systems. Delivery of the first system, consisting of two S-400 batteries and 120 missiles, was completed in September 2019, but delivery of a second system has been delayed by the inability of the two countries to agree on technology transfer and co-production.<sup>555</sup> Russia's full-scale invasion of Ukraine and Turkey's less urgently felt need for air defenses to cover territory in Syria have led some analysts to conclude that a second S-400 system will never be delivered.<sup>556</sup>

As with other defense capabilities, Turkey is working hard to develop an indigenous replacement for the S-400:

As it drifts from the Russian system, Turkey has been implementing an ambitious plan to locally produce its own missile defense systems. Experts said the short- and medium-range systems have come a long way, and some are operational, though long range air defense systems with capabilities similar to S-400 are still in the testing phase.<sup>557</sup>

In March 2023, the chairman of defense equipment manufacturer Aselsan Elektronik Sanayi echoed this sentiment: "We are making air defense systems. We don't need S-300s, S-400s."<sup>558</sup>



The delivered S-400 system is partly to blame for a souring of relations with the U.S. U.S. officials expressed grave concerns about the purchase and suspended Turkey from the F-35 program in July 2019, stating that “[t]he F-35 cannot coexist with a Russian intelligence collection platform that will be used to learn about its advanced capabilities.”<sup>559</sup> In addition, Section 1245 of the FY 2020 National Defense Authorization Act for Fiscal Year 2020 prohibits the transfer of “any F-35 aircraft or related support equipment or parts to Turkey” unless the Secretaries of Defense and State certify that Turkey “no longer possesses the S-400 air and missile defense system or any other equipment, materials, or personnel associated with such system.”<sup>560</sup>

Turkey tested the system against its F-16s in November 2019 and further tested the system at Sinop near the Black Sea in October 2020.<sup>561</sup> In December, a U.S. official stated that “[w]e object to Turkey’s purchase of the system and are deeply concerned with reports that Turkey is bringing it into operation.”<sup>562</sup> That same month, the U.S. decided to impose sanctions that took effect in April 2021.<sup>563</sup> Fearful of the effect of these sanctions, Turkey had been stockpiling spare F-16 parts since 2019.<sup>564</sup> In November 2022, Defense Minister Hulusi Akar stated that S-400 could be deployed if the circumstances warranted: “If any threats arise, we will decide where and how to use it.”<sup>565</sup> As of March 2023, despite “some testing,” Turkey did “not appear to have made the system generally operational.”<sup>566</sup>

Turkish defense firms made “more than 800 components...for the F-35 as part of a nine-nation consortium,” and Turkey’s suspension from the program may have cost Turkish defense industry as much as \$10 billion (excluding indirect costs).<sup>567</sup> (The U.S. Government Accountability Office has specified more precisely that 1,005 parts were produced by Turkish firms.<sup>568</sup>) It took some time for the consortium to move away from Turkish suppliers. As a result, “Turkish suppliers continued to supply F-35 parts to US companies until September 2021. As of September 23, 2021, Turkish defense companies stopped supplying F-35 parts and Turkey was officially removed from the program.”<sup>569</sup>

Having been removed from the F-35 program, Turkey is purportedly planning to produce a domestic fifth-generation jet, the TF-X National Combat Aircraft. A prototype was unveiled in early 2023 and may have its maiden flight in 2023 with a

goal of entering service in 2030. The TF-X appears possibly to be using engines from a U.S. company, which if true would have required Biden Administration approval.<sup>570</sup>

Turkey has been a key supporter of Ukraine. In addition to Bayraktar armed drones,<sup>571</sup> it supplies “equipment including Kirpi armoured troop carriers and body armour.”<sup>572</sup> The first of two Ada-class corvettes being built in Turkey for the Ukrainian Navy was launched at a Turkish shipyard in October 2022,<sup>573</sup> and as noted previously, Turkey’s closure of the Bosphorus and Dardanelles straits to warships has blocked Russian warships operating in the Mediterranean from entering the Black Sea to join in the assault on Ukraine.

In October 2019, Turkey launched a major offensive in Syria against the Kurdish-led Syrian Democratic Forces (SDF), partly to create a buffer zone near the Turkish border. The largest Kurdish armed faction within the SDF is the People’s Protection Units (YPG), an offshoot of the Kurdistan Workers’ Party (PKK), a U.S.-designated terrorist group that has waged war against Turkey off and on since 1984. The offensive led to the creation of a buffer zone patrolled jointly by Turkish and Russian forces following an agreement between Presidents Erdogan and Putin in Sochi.

In February 2020, Russian-backed Syrian regime forces launched an attack on Idlib, the last remaining stronghold of forces opposed to Bashar al-Assad. Turkish forces opposed the offensive and lost 36 soldiers before Turkey and Russia agreed to a cease-fire. The cease-fire was extended in February 2021 and, despite violations by the Syrian Army and rebel factions, has held because of a *détente* in Syria between Turkey and Russia. Russia is seeking to craft some sort of agreement between Turkey and Moscow’s client regime in Damascus. According to the Congressional Research Service:

Erdogan has hinted at the possibility of repairing relations with Assad, after more than a decade in which Turkey has sought an end to Assad’s rule. As of early 2023, Russia is reportedly trying to broker better ties. Turkey is seeking Syria’s help to push YPG fighters farther from the border and facilitate the return of Syrian refugees living in Turkey. Assad reportedly wants full Turkish withdrawal in return. It is unclear whether the two leaders

can compromise and how that would affect Turkey's relationship with the [Syrian National Army] and the overall dynamic with other stakeholders in northern Syria. In response to a question about potential Turkey-Syria rapprochement, the State Department spokesperson has said that U.S. officials have told allies that now is not the time to normalize or upgrade relations with the Asad regime.<sup>574</sup>

Turkish threats to renege on a 2016 agreement with the EU under which the EU paid Turkey to stop the flow of migrants to Europe are an enduring source of friction (perhaps at least partly because Turkey did in fact renege on the agreement in 2020).<sup>575</sup> Turkey and Greece remain at odds over maritime boundaries and drilling rights in the eastern Mediterranean, drilling rights off the Cypriot coast, and migration.<sup>576</sup> Turkey is reportedly planning to build a naval base in the Turkish Republic of Northern Cyprus<sup>577</sup> and began to fly UAVs out of Geçitkale Airport in December 2019.<sup>578</sup> Recent upgrades to the base have further heightened tensions.<sup>579</sup>

In March 2021, Turkey and Qatar signed a deal for Qatari pilots to train in Turkey, leading to speculation that Turkey had “decided to train its fighter pilots on Rafale jets of the Qatar Emiri Air Force (QeAF) so as to counter the Rafale fleet of its adversary, Greece.”<sup>580</sup> Qatar is sending 250 military personnel and 36 fighter jets to Turkey for training.<sup>581</sup>

U.S. security interests in the region lend considerable importance to America's relationship with Turkey. Turkey is home to Incirlik Air Base, a major U.S. and NATO facility, but it was reported early in 2018 that U.S. combat operations at Incirlik had been significantly reduced and that the U.S. was considering permanent reductions. In January 2018, the U.S. relocated an A-10 squadron from Incirlik to Afghanistan to avoid operational disruptions; these aircraft have since returned to their home base in Missouri following the U.S. withdrawal. Restrictions on the use of Incirlik for operations in Syria have proven problematic. “[The] American operation to kill Islamic State leader Abu Bakr al-Baghdadi in Syria,” for example, “saw U.S. forces use a base in Iraq instead of the much closer Incirlik, requiring a round trip of many hours.”<sup>582</sup> The U.S. reportedly began to review plans to remove nuclear weapons from

Incirlik in 2019, but no such decision has yet been taken, at least as far as is publicly known.

Turkey's Konya Air Base continues to support NATO AWACS aircraft involved in counter-ISIS operations, and Spain has deployed a Patriot system in the Turkish city of Adana under NATO auspices since 2015.<sup>583</sup> Turkey also hosts a crucial AN/TPY-2 radar at Kurecik that is part of NATO's BMD system and “may have the ability to track targets more than 1,800 miles away, depending on its position.”<sup>584</sup>

Turkey has a 355,200-strong active-duty military,<sup>585</sup> which is NATO's second largest after that of the United States, but as one analyst has cautioned, “the size of the military is a direct result of conscription. Mandatory military service, however, does not often translate into power.”<sup>586</sup> The Turks have contributed to a number of peacekeeping missions in the Balkans; still maintain 335 troops in Kosovo,<sup>587</sup> and have participated in counterpiracy and counterterrorism missions off the Horn of Africa in addition to deploying planes, frigates, and submarines during the NATO-led operation in Libya. Turkey is among countries listed as contributors to the Standing NATO Maritime Groups and Standing NATO Mine Countermeasures Groups.<sup>588</sup> It has taken part in Baltic Air Policing twice, most recently from May–September 2021 when four F-16s and 80 troops deployed to Malbork, Poland.<sup>589</sup> In 2021, Turkey commanded NATO's Very High Readiness Joint Task Force.<sup>590</sup>

Turkey, which in 2023 will spend only 1.37 percent of GDP on defense and 25.52 percent of its defense budget on equipment,<sup>591</sup> has become increasingly self-reliant with respect to its defense capabilities. A particular success has been its Bayraktar drone program, and Turkey is investing further in autonomous systems. This is paying dividends: Turkey surpassed its export target in 2022, attaining \$4.4 billion in arms exports, and hopes to export \$6 billion in arms in 2023.

Between 2020 and 2021, “[r]evenue from overseas defense exports rose by 42%...with foreign contracts making up as much as 90% of revenue for some Turkish companies—like Baykar.”<sup>592</sup> Nevertheless, \$6 billion will fall short of the \$10.2 billion export target for 2023 set out in the Strategic Plan 2019–2023 released in December 2019 by Turkey's Presidency of Defense Industries.<sup>593</sup> The plan also “aims to meet 75% of its weaponry requirements through indigenous production by 2023. However,

GlobalData’s forecast suggest[s] this number will narrowly be missed, with only 71% of procurements in 2023 likely to fulfill this target.”<sup>594</sup>

A key struggle is Turkey’s continued reliance on components from Western companies, including for its drones. In particular, the Bayraktar drone relies on “optical/infrared imaging and targeting sensor systems” from a Canadian company.<sup>595</sup> As one analyst has written:

Overall, Turkish industries can now design, produce, modernize, and export—at varying levels of domestic contribution—some core conventional arms and equipment such as corvettes, fire support systems, unmanned aircraft systems, gliding munitions for drones, joint-direct attack munitions, across-the-spectrum land warfare platforms (except for main battle tanks), grenade launchers, and tactical anti-material rifles. On the other hand, the defense sector demands international cooperation, marking the limits of independence, at least at the time being, on strategic weapons and high-end arms, such as exo-atmospheric ballistic missile defense, fifth-generation tactical military aviation, air-independent propulsion submarines, and space-based assets....<sup>596</sup>

Over “the next two to three years,” more than 350 indigenously produced Atmaca anti-ship cruise missiles will replace U.S.-produced Harpoon missiles on Turkey’s Ada-class corvettes, Istanbul-class frigates, and TF2000-class anti-air warfare destroyers” with a goal of saving as much as \$500 million “as the homemade missile comes in at around half the price of a Harpoon.”<sup>597</sup>

Turkey “also has plans for a ‘mobile naval mine’ that can be used for surveillance and to attack ships, as well as for unmanned fighter jets and strike aircraft to be used on its amphibious assault ships, which officials say will be able to carry 30 to 50 drones.”<sup>598</sup> The first flight test for the prototype of the unmanned fighter, the Bayraktar Kizilelma, took place on December 14, 2022. The jet purportedly “will be able to take off and land on aircraft carriers with short runways and conduct missions with internally carried munitions.”<sup>599</sup>

In addition, Turkey is seeking to modernize its manned aircraft, especially in light of planned Greek procurements of F-35s and French Dassault

Rafales F3R fighters.<sup>600</sup> In October 2021, Turkey made a request to purchase 40 F-16 fighters and 80 modernization kits for its older fleet of F-16s, and in a March 2022 letter to Congress, the State Department found “compelling long-term NATO alliance unity and capability interests, as well as U.S. national security, economic and commercial interests that are supported by appropriate U.S. defense trade ties with Turkey.”<sup>601</sup> In May 2022, the Biden Administration asked Congress to approve the sale of electronics, missiles, and radar to Turkey for F-16 upgrades.<sup>602</sup> Following Turkey’s June 2022 announcement that it was lifting its objections to Finland and Sweden joining NATO, the Administration reiterated its support for the modernization kits and the sale of new F-16s to Turkey because, “Turkey’s modernization of its fighter fleet...is a contribution to NATO security and therefore American security.”<sup>603</sup>

In January 2023, the State Department informed Congress that it intended to proceed with the \$20 billion sale of new F-16s and modernization kits.<sup>604</sup> Congress remains opposed, partly because of Turkey’s continued blocking of Sweden’s accession to NATO despite its earlier assurances.<sup>605</sup> While “Congress can block a sale by passing a resolution of disapproval after a formal notification of a sale,” it is unclear whether the Administration would proceed in the face of congressional disapproval or whether Congress could muster the votes to block a sale if it were to take place.<sup>606</sup> Absent U.S. modernization kits, Turkey once again is turning to its own domestic industry to modernize its aging fleet. Its Ozgur Project “includes new avionics, structural improvements, and a locally-produced active electronically scanned array (AESA) radar that will be retrofitted onto its Block 30 F-16s.”<sup>607</sup>

Turkey’s procurement of 250 new Altay main battle tanks has been delayed for years because of the need to acquire foreign components. The tank had relied on a German-made engine and transmission, as well as French armor, but the technology transfer was not approved. In March 2022, Turkey announced an agreement with two South Korean manufacturers to produce the engine and transmission for the tank.<sup>608</sup> In January 2023, President Erdogan announced that two Altays would be delivered in May and that long-delayed mass production would begin in 2025.<sup>609</sup>

In January 2022, after years of delays, Pakistan cancelled a \$1.5 billion deal for 30 T129 ATAK

helicopters that had been signed in 2018.<sup>610</sup> The helicopter's engine is produced by American and British firms, and Turkey has yet to field a domestic replacement. In April 2021, the U.S. granted export licenses for the sale of six T129s to the Philippines; its refusal to issue export licenses for the sale to Pakistan led to the deal's cancellation.<sup>611</sup> In February 2022, Turkey announced that a Ukrainian-developed engine for its larger T929 helicopter gunship would be produced in Turkey. The first two engines were delivered to Turkey in March 2023. The helicopter is scheduled to make its first flight this year.<sup>612</sup>

France and Italy continue to block joint development of anti-ballistic missiles with Turkey because of Turkey's actions in Syria.<sup>613</sup> President Erdogan has personally lobbied French President Macron to allow Turkey to purchase the French-Italian EUROSAM consortium's SAMP/T missile-defense systems.<sup>614</sup> In March 2022, France and Italy reportedly agreed to "explore reviving the steps for the SAMP/T missile defense system."<sup>615</sup> Italian Prime Minister Meloni reportedly made similar statements about wanting to find a solution to the impasse in November.<sup>616</sup>

Another major procurement is for six Type-214 submarines. The first, the TCG *PiriReis*, was launched in May 2021, underwent sea trials in December 2022, and will likely enter service in 2023, and one of the remaining five will be delivered each year from 2023–2027.<sup>617</sup> In February 2019, Turkey announced that upgrades of four *Preveze*-class submarines would take place from 2023–2027.<sup>618</sup> In February 2022, it was reported that "sea acceptance trials of the early delivered systems and the Critical Design Phase of the Preveze Mid-Life Modernisation Project have been successfully completed."<sup>619</sup>

The intelligence-gathering ship TCG *Ufuk*, which President Erdogan has described as the "eyes and ears of Turkey in the seas,"<sup>620</sup> was commissioned in January 2022.<sup>621</sup>

**The Baltic States.** The U.S. has championed the sovereignty and territorial integrity of the Baltic States ever since the interwar period of the 1920s. Since regaining their independence from the Soviet Union in the early 1990s, the Baltic States have been staunch supporters of the transatlantic relationship. Although small in absolute terms, the three countries contribute significantly to NATO in relative terms.

*Estonia.* Estonia has been a leader in the Baltics in terms of defense spending. In 2022, it spent 2.12 percent of GDP on defense and 21.57 percent of its defense budget on new equipment.<sup>622</sup> In December, Prime Minister Kaja Kallas announced that Estonia's defense budget would exceed 3 percent of GDP by 2024.<sup>623</sup>

In September 2022, Estonia signed an agreement to acquire the short-range, man-portable Piorun air defense system with delivery of 100 Piorun gripstocks and 300 missiles to begin in the second half of 2023.<sup>624</sup> Estonia is also expected to announce a contract for the joint procurement with Latvia of medium-range air defense systems and "could be getting its own medium-range air defense system in three years' time."<sup>625</sup> In October 2021, Estonia signed a contract to purchase the Blue Spear 5G coastal shore-to-ship mobile defense system.<sup>626</sup> The system, likely to arrive by the end of 2023,<sup>627</sup> will be integrated with Finland's coastal defense systems, "which would allow the countries to close the Gulf of Finland to Russian warships if necessary."<sup>628</sup>

Estonia's Ministry of Defence Development Plan 2031, released in December 2021, details investments in ammunition stocks along with renovation of Ämari airfield, a modern War and Disaster Medicine Centre in Tartu, "mid-range anti-tank weapons for all infantry brigades," R-20 Rahe assault rifles, a mid-range air surveillance radar, CV-9035 armored combat vehicle upgrades, and naval mines.<sup>629</sup> In February 2022, Estonia announced its largest defense procurement, a \$794 million joint Estonia-Latvia purchase of "mostly logistical vehicles including cranes, loaders and aircraft loaders"<sup>630</sup> that were "expected to start arriving in 2023."<sup>631</sup> In December 2022, Estonia signed an agreement for six M142 High Mobility Artillery Rocket Systems worth more than \$200 million with deliveries to begin in 2024. "[I]n addition to the weapon system," according to an Estonian Centre for Defence Investments official, "Estonia will also procure ammunition, communications solutions, as well as training, logistics, and life-cycle solutions. The package includes rockets with different effects, ranging from 70 to 300 kilometers."<sup>632</sup>

Although the Estonian armed forces total only 7,200 active-duty personnel (including the army, navy, and air force),<sup>633</sup> they are held in high regard by their NATO partners and punch well above their weight inside the alliance. Between 2003 and 2011,

455 Estonians served in Iraq. Perhaps Estonia's most impressive deployment was to Afghanistan: More than 2,000 Estonian troops were deployed between 2003 and 2014 and sustained the second-highest number of deaths per capita among all 28 NATO members.

In 2015, Estonia reintroduced conscription for men ages 18–27, who must serve eight or 11 months before being added to the reserve rolls.<sup>634</sup> The number of conscripts will increase from 3,500 in 2022 to 3,800 in 2024 and 4,000 in 2025 at a cost of €4 million a year for each additional 500 conscripts in addition to barracks and other facilities to “meet the increased need for space across units.”<sup>635</sup>

Estonia has demonstrated that it takes defense and security policy seriously, focusing on improving defensive capabilities at home while maintaining the ability to be a strategic actor abroad. Estonia is acquiring 24 South Korean–built K9 self-propelled howitzers at a total cost of \$88 million and as of January 2023 had taken delivery of 18.<sup>636</sup> That same month, it signed a \$38.9 million contract for an additional 12 K9s with deliveries through 2026.

In October 2020, Estonia withdrew from a joint armored vehicle development program with Latvia and Finland for financial reasons, but in April 2022, it announced an expedited €200 million procurement for 220 wheeled armored vehicles.<sup>637</sup> In 2019, it received two C-145A tactical transport aircraft donated by the U.S.<sup>638</sup>

In 2017, Estonia and the U.S. strengthened their bilateral relationship by signing a defense cooperation agreement that builds on the NATO–Estonia Status of Forces Agreement, further clarifying the legal framework for U.S. troops in Estonia. U.S. Ambassador James Melville called the agreement “a major step for enhanced defense and security cooperation in the context of the North Atlantic Alliance.”<sup>639</sup>

Estonian forces have participated in a number of operations. These involvements include, for example, 45 soldiers in Resolute Support before its end, a vessel as part of the Standing NATO Mine Countermeasures Group One, a logistics officer for the EU's Operation IRINI, and troops for NATO Mission Iraq and the U.S.-led Operation Inherent Resolve in Iraq.<sup>640</sup> In February 2022, Estonia announced the withdrawal from Mali of 95 troops who had been taking part in the French-led Operation Barkhane, completed in November 2022.<sup>641</sup>

*Latvia.* Latvia's recent military experience has been centered on operations in Iraq and Afghanistan with NATO and U.S. forces. Latvia deployed more than 3,000 troops to Afghanistan and between 2003 and 2008 deployed 1,165 troops to Iraq. It also has contributed to a number of other international peacekeeping and military missions. Its clear focus, however, is territorial defense.

A recent IISS analysis notes that “[t]here is no capacity to independently deploy and sustain forces beyond national boundaries, although the armed forces have taken part in NATO and EU missions.”<sup>642</sup> Nevertheless, despite a military that consists of only 6,600 full-time servicemembers, Latvia deployed troops to NATO's Resolute Support Mission until the mission's completion; participates in Operation Inherent Resolve in Iraq, where the mandate for Latvian soldiers taking part was extended in March 2022 and now runs until February 2024; and has 136 troops deployed in NATO's KFOR mission.<sup>643</sup>

Latvia aims “to increase the share of combat-ready population...to 50,000” by 2027, with 14,000 “to operate in active service units,” 16,000 “to serve in the National Guard,” and 20,000 “in the reserve force.”<sup>644</sup> In April 2023, the Latvian parliament passed a bill reintroducing mandatory military conscription for males aged 18 to 27 (conscription had been abolished in 2007).<sup>645</sup> Conscripts can serve “11 months in the National Armed Forces or the National Guard; five years in the National Guard, with at least 21 individual training days per year and 7 collective training days per year; [or by] finishing a five-year education university program of a Reserve Lieutenant.”<sup>646</sup>

In 2022, Latvia's former Minister of Defense raised the possibility of opening “a new training field and a second international base” in Latvia for allied forces that “are currently based in Ādaži.”<sup>647</sup> In November 2022, the Canadian commander of NATO's EFP in Latvia expressed his view that “[t]he amount of resources that the Russians have invested now in Ukraine, and that they are losing in Ukraine, is reducing their ability to do something in this theatre rapidly.” Nevertheless, the Russians are still a threat: “What they're going to do in the future is really in President (Vladimir) Putin's hands...but the threat is very real.”<sup>648</sup>

In 2022, Latvia spent 2.07 percent of GDP on defense and 24.58 percent of its defense budget on equipment, exceeding both NATO benchmarks.<sup>649</sup>

Latvia continues to bolster its defense budgets, spending around 2.25 percent of GDP on defense in 2023. In February, Defense Minister Ināra Mūrniece stated that the nation could hit 3 percent of GDP on defense before the planned date of 2027 due to upcoming procurements.<sup>650</sup> Contracts for the acquisition of six M142 HIMARS, for example, could be signed in 2023,<sup>651</sup> and Latvia is also reportedly in negotiations to purchase the Norwegian-made Naval Strike Missile Coastal Defence System sometime in 2023.<sup>652</sup>

In December 2022, the first two of Latvia's four UH-60M Black Hawk helicopter procurement (a \$200 million agreement signed in 2018) were delivered from the U.S. with the remaining two "slated for delivery by the end of 2023." As of December 2022, five crews had been trained on the Black Hawks, which are replacing Latvia's Mi-17 helicopter fleet, and "Latvian personnel [had] been training for future helicopter flight and maintenance since 2020."<sup>653</sup>

Latvia is also procuring the RBS 70 NG short-range ground-based air defense system and Giraffe 1X radar from Swedish manufacturer Saab<sup>654</sup> and in June 2022 "signed a joint letter of intent [with Estonia] for the purchase of medium-range air defense systems."<sup>655</sup> According to the IISS, "Estonia signalled its intention in 2022 to join the European Sky Shield initiative, to boost air defence capacity. As well as capability development, modernisation spending is directed toward improving infrastructure and readiness."<sup>656</sup> Other joint procurements include (with Estonia) logistics vehicles and (with Finland) 200 armored vehicles for Latvian forces, the first two of which were delivered in March 2022 and all of which are to be delivered by 2029.<sup>657</sup>

Latvia is upgrading fencing along its border with Belarus into permanent fencing to stem the flow of migrants "illegally pushed into Latvia from Belarus."<sup>658</sup> The first phase of the upgrade will be completed in the fall of 2023, with the second and third phases complete by the end of 2024.<sup>659</sup> Early in 2022, Latvia's State Border Guard received 67 Polaris tactical vehicles worth \$2 million from the United States. "Since 2018, the United States has provided more than seven million dollars in aid to the Latvian Border Guard," which was "scheduled to receive another 18 'Polaris' tactical vehicles by the end of [2022]."<sup>660</sup>

*Lithuania.* Lithuania is the largest of the three Baltic States, and its armed forces total 23,000 active-duty troops.<sup>661</sup> The government reintroduced conscription in 2015 and lowered the age for compulsory service in December 2019.<sup>662</sup> In January 2023, Chief of Defence Valdemaras Rupšys detailed potential conscription reforms to "help achieve the goal of having 40,000 active reserve soldiers in the armed forces."<sup>663</sup>

Lithuania has shown a steadfast commitment to international peacekeeping and military operations. Between 2003 and 2011, it sent 930 troops to Iraq. From 2002–2021, around 3,000 Lithuanian troops served in Afghanistan, and Lithuania continues to contribute to NATO's KFOR, NATO Mission Iraq, and a few EU-led missions in Africa. Lithuania has supported Ukraine in part by taking part in the U.K.-led Operation Interflex to train and support Ukraine's territorial defense forces, as well as the German-led EU Military Assistance Mission in support of Ukraine training.<sup>664</sup> Lithuania trained Ukrainian forces even before 2022 and will train about 2,000 Ukrainian troops this year.<sup>665</sup>

In 2022, Lithuania spent 2.47 percent of GDP on defense and 34.54 percent of its defense budget on equipment.<sup>666</sup> In March 2023, Lithuania added another € 97.5 million to its defense budget for the year, raising defense spending to 2.52 percent of GDP for the year. "The Defence Ministry has said it will use additional funds for speeding up certain planned acquisitions, for instance, of multiple launch rocket systems, combat drones, as well as other arms and ammunition."<sup>667</sup>

In April 2019, the U.S. and Lithuania signed a five-year "road map" defense agreement.<sup>668</sup> According to the DOD, the agreement will help "to strengthen training, exercises and exchanges" and help Lithuania "to deter and defend against malicious cyber intrusions and attacks." The two nations also pledged "to support regional integration and procurement of warfighting systems," including "integrated air and missile defense systems and capabilities to enhance maritime domain awareness."<sup>669</sup> A Mobilisation and Host Nation Support law took effect in January 2021.<sup>670</sup> In December 2021, the U.S. and Lithuania signed a Reciprocal Defense Procurement Agreement that U.S. Secretary of Defense Austin stated "will improve conditions for the acquisition of defense items and increase military interoperability."<sup>671</sup>

The IISS notes that “Lithuania signalled its intention in 2022 to join the European Sky Shield initiative, to boost air defence capacity. Vilnius is also looking to acquire new rocket artillery capabilities, in common with other Baltic states, and acquire additional self-propelled artillery as well as loitering munitions.”<sup>672</sup>

In November 2020, Lithuania signed a \$213 million deal to purchase four UH-60M Black Hawk helicopters beginning in late 2024; the U.S. is contributing approximately \$30 million to help with the acquisition.<sup>673</sup> In October 2022, Lithuania signed a \$32 million contract to procure additional Swedish-made RBS 70 “very short range air defense missiles,” to be delivered in 2023 and 2024.<sup>674</sup>

In October 2020, Lithuania received two Norwegian-made NASAMS mid-range air defense batteries “armed with US-made advanced medium-range air-to-air missiles (AMRAAM) that can destroy aircraft and missiles located at a distance of several tens of kilometres.”<sup>675</sup> Lithuania plans to acquire additional NASAMS in 2023, and according to one analyst, “Just having this system is like a big deterrent hedgehog for enemy planes.”<sup>676</sup> In February, Lithuanian President Gitanas Nausėda said that “Lithuania is ready to contribute to repairing the NASAMS medium-range air defense systems handed over to Ukraine.”<sup>677</sup>

In March 2022, Lithuania announced a \$40 million purchase of additional Javelin anti-tank weapons.<sup>678</sup> In April 2021, the U.S. donated \$10 million worth of M72 Light-Armor Weapons to Lithuania.<sup>679</sup> In December 2022, Lithuania announced a \$48 million contract for an unspecified number of Switchblade 600 kamikaze drones.<sup>680</sup> In October 2022, Lithuania increased its order of U.S.-made Oshkosh Joint Light Tactical Vehicles (JLTV) from 200 to 500. About 100 vehicles were delivered in 2022, with the remaining expected from 2023 to 2024.<sup>681</sup> In January 2022, it was reported that Saab had recently “signed a framework agreement with the Lithuanian Ministry of Defence to provide the country with several Carl-Gustaf M4 recoilless weapons and ammunition” and that Lithuania’s “Defence Materiel Agency has placed a \$16.7 million ammunition order as part of the framework agreement.”<sup>682</sup>

In December 2022, Lithuania and the U.S. signed a \$495 million agreement for eight M142 HIMARS systems with deliveries beginning in 2025 and

ending in 2026. The agreement “includes Army Tactical Missile Systems, or ATACMS, which have a range of 300 kilometers, and other ammunition. A State Department notice [in November 2022] said several dozen Guided Multiple Launch Rocket Systems, and variants of them, would be included.”<sup>683</sup>

### Current U.S. Military Presence in Europe

At its peak in 1953, because of the Soviet threat to Western Europe, the U.S. had approximately 450,000 troops in Europe operating across 1,200 sites. During the early 1990s, both in response to a perceived reduction in the threat from Russia and as part of the so-called peace dividend following the end of the Cold War, the number of U.S. troops in Europe was slashed. Today, the U.S. has fewer than 66,000 active-duty forces permanently stationed in Europe. However, increased numbers of rotational forces deployed to Europe to bolster deterrence in eastern NATO member states have raised total U.S. deployments to around 100,000.<sup>684</sup>

EUCOM “executes a full range of multi-domain operations in coordination with Allies and partners to support NATO, deter Russia, assist in the defense of Israel, enable global operations, and counter trans-national threats in order to defend the Homeland forward and fortify Euro-Atlantic security.”<sup>685</sup> It is supported by four service component commands (U.S. Naval Forces Europe, U.S. Army Europe and Africa, U.S. Air Forces in Europe, and U.S. Marine Forces Europe) and one subordinate unified command (U.S. Special Operations Command Europe).

In response to Russia’s second invasion of Ukraine, EUCOM created Control Center Ukraine (ECCU) to coordinate defense assistance to Ukraine. A “senior defense official” has described ECCU as “a combination of a call center, a watch floor, meeting rooms. They execute a battle rhythm to support decision-makers as well as 24/7 engagement and coordination around the globe with about 40 to 60 people at any given time.”<sup>686</sup>

### Conclusion

The European region remains a mature and friendly operating environment. Russia remains the preeminent military threat, and its continued operations against Ukraine have added instability to the theater, particularly in the Black Sea region. In addition to the threat from Russia, Chinese propaganda, influence operations, and

investments in key sectors present an additional—and serious—threat.

The past year has proven to be an inflection point for transatlantic security with many European allies reinvesting in defense and capabilities. The long-term capacity of allies to sustain a commitment to defense remains to be seen, as does the outcome of the Russia–Ukraine war, which is dramatically reshaping the threat perception in Europe and necessitating operational planning that takes into account what is transpiring on a daily basis.

America’s closest and oldest allies are located in Europe, and the region is incredibly important to the U.S. for economic, military, and political reasons. Perhaps most important, the U.S. has treaty obligations through NATO to defend the European members of that alliance. If the U.S. needs to act in or near the European region, there is a history of interoperability with allies and access to key logistical infrastructure despite very real military mobility shortfalls that makes the operating environment in Europe more favorable than the environment in other regions in which U.S. forces might have to operate.

The past year saw continued U.S. reengagement with the continent, both militarily and politically, along with continued increases in European allies’ defense budgets and capability investments. The U.S. has increased its investment in Europe, and its

military position on the continent is stronger than it has been for some time. NATO continues to return to a war footing, seeking to relearn the lessons of the past, and to put in place the doctrine, plans, and force structure necessary to provide a lasting deterrent to Russia.

The military, economic, political, and societal impact of Russia’s aggression in Ukraine, including China’s support for and enablement of the regime in Moscow, will have to be reckoned with for years to come. Though Russia is experiencing significant battlefield losses, it will be prudent for defense planners to assume that Russia will replace those losses of old equipment with modern, improved items, thereby sustaining the challenge to U.S. and NATO-partner security interests.

NATO’s renewed focus on collective defense has resulted in a focus on logistics, force generation, capability investment, newly established commands that reflect a changed geopolitical reality, and a robust set of exercises. NATO’s biggest challenges derive from potential spillover from Ukraine, arming and assisting Ukrainian forces with rapidly depleted stocks, continued capability and readiness gaps for many European nations, continuing improvements and exercises in the realm of logistics, and the need to establish the ability to mount a robust response to both linear and nonlinear forms of aggression.

## Scoring the European Operating Environment

As noted at the beginning of this section, various considerations must be taken into account in assessing the regions within which the U.S. may have to conduct military operations to defend its vital national interests. Our assessment of the operating environment utilized a five-point scale, ranging from “very poor” to “excellent” conditions and covering four regional characteristics of greatest relevance to the conduct of military operations:

**1. Very Poor.** Significant hurdles exist for military operations. Physical infrastructure is insufficient or nonexistent, and the region is politically unstable. The U.S. military is poorly placed or absent, and alliances are nonexistent or diffuse.

**2. Unfavorable.** A challenging operating environment for military operations is marked by inadequate infrastructure, weak alliances, and recurring political instability. The U.S. military is inadequately placed in the region.

**3. Moderate.** A neutral to moderately favorable operating environment is characterized by adequate infrastructure, a moderate alliance structure, and acceptable levels of regional political stability. The U.S. military is adequately placed.

**4. Favorable.** A favorable operating environment includes good infrastructure, strong alliances, and a stable political environment. The U.S. military is well placed in the region for future operations.



**5. Excellent.** An extremely favorable operating environment includes well-established and well-maintained infrastructure; strong, capable allies; and a stable political environment. The U.S. military is exceptionally well placed to defend U.S. interests.

The key regional characteristics consist of:

- a. Alliances.** Alliances are important for interoperability and collective defense, as allies are more likely to lend support to U.S. military operations. Various indicators provide insight into the strength or health of an alliance. These include whether the U.S. trains regularly with countries in the region, has good interoperability with the forces of an ally, and shares intelligence with nations in the region.
- b. Political Stability.** Political stability brings predictability for military planners when considering such things as transit, basing, and overflight rights for U.S. military operations. The overall degree of political stability indicates whether U.S. military actions would be hindered or enabled and considers such questions as whether transfers of power are generally peaceful and whether there have been any recent instances of political instability in the region.
- c. U.S. Military Positioning.** Having military forces based or equipment and supplies staged in a region greatly enhances the ability of the United States to respond to crises and presumably achieve success in critical “first battles” more quickly. Being routinely present in a region also helps the U.S. to maintain familiarity with its characteristics and the various actors that might try to assist or thwart U.S. actions. With this in mind, we assessed whether or not the U.S. military was well positioned in the region. Again, indicators included bases, troop presence, prepositioned equipment, and recent examples of military operations (including training and humanitarian) launched from the region.

**d. Infrastructure.** Modern, reliable, and suitable infrastructure is essential to military operations. Airfields, ports, rail lines, canals, and paved roads enable the U.S. to stage, launch operations from, and logistically sustain combat operations. We combined expert knowledge of regions with publicly available information on critical infrastructure to arrive at our overall assessment of this metric.

For Europe, the duration of Russia’s war on Ukraine, its mounting cost and savagery, and the questions it poses for the future of Europe, NATO, and individual countries has forced European governments and citizenry to seriously consider the conditions of their political dynamics, economic dependencies, and their ability to provide for domestic security interests. In the *2023 Index*, we noted a strengthening in alliance relationships as NATO member countries conducted reviews of their respective military establishments and the ability of NATO, as a whole, to properly coordinate actions. NATO placed renewed emphasis on logistical matters and the extent to which it could respond to an emergent crisis. In 2024, we have seen a galvanizing effect within political establishments that, while continuing to be dynamic and pointed within the domestic context of each country, appear to be improved in their aggregate stability as countries get serious about national matters that have arguably been neglected since the end of the Cold War. Within specific countries there are ongoing shifts between liberal and conservative governments but the net result has been generally positive with respect to U.S. security interests, especially as countries commit to improving their defense capabilities, readiness, and posture. This has led us to increase Europe’s score for political stability from Favorable to Excellent.

- Alliances: **5—Excellent**
- Political Stability: **5—Excellent**
- U.S. Military Positioning: **4—Favorable**
- Infrastructure: **4—Favorable**

Leading to a regional score of: **Favorable**

# Operating Environment: Europe

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             |          |           | ✓         |
| Political Stability   |           |             |          |           | ✓         |
| U.S. Military Posture |           |             |          | ✓         |           |
| Infrastructure        |           |             |          | ✓         |           |
| <b>OVERALL</b>        |           |             |          | ✓         |           |

## Endnotes

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# Middle East

Nicole Robinson

The Middle East has long been an important focus of United States foreign and security policy. U.S. security relationships in this strategically important region at the intersection of Europe, Asia, and Africa are built on pragmatism, shared security concerns, and economic interests that include large sales of U.S. arms that enhance the ability of countries in the region to defend themselves. The U.S. also has a long-term interest that derives from the region's importance as the world's primary source of oil and gas.

America's vital national security interests in the Middle East endure but have evolved beyond 1981 when the United States was dependent on Middle East oil. By 2018, the U.S. imported only 11 percent of its oil, the lowest amount since 1957.

The Middle East is a critical component of the global economy. It accounts for 31 percent of global oil production, 18 percent of gas production, 48 percent of proven oil reserves, and 40 percent of proven gas reserves. Approximately 12 percent of global trade and 30 percent of global container traffic traverses the Suez Canal, transporting more than \$1 trillion worth of goods each year. In 2018, the Middle East's daily oil flow constituted approximately 21 percent of global petroleum consumption. Moreover, the region's significance is not limited to energy. Sixteen of the submarine cables that connect Asia and Europe pass through the Red Sea. While the United States may no longer be dependent on the region's petrochemical resources, the global economy is.<sup>1</sup>

The region is home to a wide array of cultures, religions, and ethnic groups: Arabs, Jews, Kurds, Persians, and Turks among others. It also is home to the three Abrahamic religions of Judaism, Christianity, and Islam as well as many smaller religions like the Bahá'í, Druze, Yazidi, and Zoroastrian faiths.

The region contains many predominantly Muslim countries as well as the world's only Jewish state.

The Middle East is deeply sectarian, characterized by long-standing divisions that, exacerbated by religious extremists' constant vying for power, in some cases are centuries-old. Contemporary conflicts, however, have more to do with modern extremist ideologies and the fact that today's borders often do not reflect cultural, ethnic, or religious realities. Instead, they are often the results of decisions taken by the British, French, and other powers during and soon after World War I as they dismantled the Ottoman Empire.<sup>2</sup>

In a way that many in the West do not understand, religion remains a prominent fact of daily life in the modern Middle East, and the friction within Islam between Sunnis and Shias—a friction that dates back to the death of the Prophet Muhammad in 632 AD<sup>3</sup>—is at the heart of many of the region's conflicts. Sunni Muslims, who form the majority of the world's Muslim population, hold power in most of the region's Arab countries.

However, viewing the Middle East's current instability through the lens of a Sunni–Shia conflict does not reveal the full picture. The cultural and historical division between Arabs and Persians has reinforced the Sunni–Shia split. The mutual distrust between many Sunni Arab powers and Iran, the Persian Shia power, compounded by clashing national and ideological interests, has fueled instability in such countries as Iraq, Lebanon, Syria, and Yemen. Sunni extremist organizations like al-Qaeda and the Islamic State (IS) have exploited sectarian and ethnic tensions to gain support by posing as champions of Sunni Arabs against Syria's Alawite-dominated regime and other non-Sunni governments and movements.

Regional demographic trends also are destabilizing factors. The Middle East's population is one of the youngest and fastest-growing in the world. This would be viewed as an advantage in most of the West, but not in the Middle East. Known as "youth bulges," these demographic tsunamis have overwhelmed many countries' inadequate political, economic, and educational infrastructures, and the lack of access to education, jobs, and meaningful political participation fuels discontent. Because more than half of the region's inhabitants are less than 30 years old, this demographic bulge will continue to undermine political stability across the region.<sup>4</sup>

The Middle East has more than half of the world's oil reserves and is the world's chief oil-exporting region.<sup>5</sup> As the world's largest producer and consumer of oil,<sup>6</sup> the U.S. actually imports relatively little of its oil from the Middle East. Nevertheless, it has a vested interest in maintaining the free flow of oil and gas from the region. Oil is a fungible commodity, and the U.S. economy remains vulnerable to sudden spikes in world oil prices.

During the COVID-19 crisis, oil prices fell temporarily below zero in April 2020 after stay-at-home orders caused a severe imbalance between supply and demand. This unprecedented drop in demand sparked an oil price war between Saudi Arabia and Russia, both of which tried to maintain revenue by increasing the price of the reduced amount of oil sold. Although both countries eventually agreed to reduce production by 12 percent, the plummet in oil prices during 2020 caused significant shocks for both exporters and importers.<sup>7</sup>

U.S. energy policies during 2021 exacerbated the problem. The new Administration's decisions to shutter some existing energy production and refuse permission for new exploration made the U.S. more sensitive to Middle East-based volatility in the energy market. Then Russia's invasion of Ukraine made matters worse. The price of oil jumped to more than \$139 a barrel while gas prices doubled—the highest levels for both in almost 14 years.<sup>8</sup> In November 2021 and February 2022, Saudi Arabia declined a U.S. request to increase oil production, choosing instead to abide by the April 2020 agreement between the Organization of the Petroleum Exporting Countries (OPEC) and Russia to cut production.<sup>9</sup> Then, in April 2023, OPEC and Russia announced a massive supply cut totaling 1.6 million barrels per day, causing oil prices to jump by \$7 a barrel.<sup>10</sup>

Because many U.S. allies depend on Middle East oil and gas, there is also a second-order effect for the U.S. if supply from the Middle East is reduced or compromised. For example, Japan is the world's third-largest economy<sup>11</sup> and largest importer of liquefied natural gas (LNG).<sup>12</sup> The U.S. might not have to depend on Middle East oil or LNG, but the economic consequences arising from a major disruption of supplies would ripple across the globe. Thus, tensions and instabilities continue to affect global energy markets and directly affect U.S. national security and economic interests.

Beijing knows the Middle East is a vital source of the energy that fuels its economic growth and military. China's economy and military depend on external resources, which helps to explain why it developed its Belt and Road Initiative (BRI) to obtain the resources it requires and sustain the routes that connect China to those resources. Imports currently constitute nearly 70 percent of China's overall oil consumption. Of these imports, 43 percent come from the Gulf region, and China's oil imports will continue to grow to an estimated 80 percent of its total consumption by 2030.<sup>13</sup> *It would be a grave strategic error to abandon the Middle East and its petrochemical resources, which sustain the global economy, to Xi Jinping and the Chinese Communist Party.*

Financial and logistics hubs are growing along some of the world's busiest transcontinental trade routes, and one of the region's economic bright spots in terms of trade and commerce is in the Persian Gulf. The emirates of Dubai and Abu Dhabi in the United Arab Emirates (UAE), along with Qatar, are competing to become the region's top financial center.

The economic situation is part of what drives the region's political environment. The lack of economic freedom helped to fuel the popular discontent that led ultimately to the Arab Spring uprisings, which began in early 2011 and disrupted economic activity, depressed foreign and domestic investment, and slowed economic growth. Sustained financial and economic growth could lead to greater opportunities for the region's people, but tensions will persist as countries compete for this added wealth.

The COVID-19 pandemic and Russia's war on Ukraine have had massive repercussions for the entire region, affecting economies and shaking

political systems. The World Bank “forecast[s] that the MENA [Middle East and North Africa] region will grow by 3 percent in 2023 and by 3.1 percent in 2024, much lower than the growth rate of 5.8 percent in 2022.”<sup>14</sup> Countries that were already facing economic challenges before the pandemic are now facing a long period of recovery during which the likelihood of political instability in an already fragile region can be expected to increase.

The political environment has a direct bearing on how easily the U.S. military can operate in any region of the world. The political situation in many Middle Eastern countries remains fraught with uncertainty. The Arab Spring uprisings of 2010–2012 formed a sandstorm that eroded the foundations of many authoritarian regimes, erased borders, and destabilized many of the region’s countries,<sup>15</sup> but the popular uprisings in Tunisia, Libya, Egypt, Bahrain, Syria, and Yemen did not usher in a new era of democracy and liberal rule as many in the West were hoping would happen. At best, they made slow progress toward democratic reform; at worst, they added to political instability, exacerbated economic problems, and contributed to the rise of Islamist extremists.

Today, the region’s economic and political outlooks remain bleak. In some cases, self-interested elites have prioritized regime survival over real investment in human capital, aggravating the material deprivation of youth as issues of endemic corruption, high unemployment, and the rising cost of living remain unresolved. Since 2019, large-scale protests have called attention to the region’s lack of economic and political progress. COVID-19 lockdowns and curfews temporarily disrupted protests in Lebanon and Iraq. Demonstrations resumed in 2020 but failed to gain momentum. More recently, the spike in food and gas prices caused in part by the Russian invasion of Ukraine has sparked demonstrations in Iraq and bank robberies in Lebanon<sup>16</sup> that, along with ongoing socioeconomic deterioration, have further fueled discontent.<sup>17</sup> If similar protests were to break out across the region, they could easily affect the operational environment for U.S. forces.

There is no shortage of security challenges for the U.S. and its allies in this region. Using the breathing space and funding afforded by the July 14, 2015, Joint Comprehensive Plan of Action (JCPOA), for example, Iran exploited Shia–Sunni tensions

to increase its influence on embattled regimes and undermine adversaries in Sunni-led states. In May 2018, the Trump Administration left the JCPOA after European allies failed to address many of its serious flaws, including its sunset clauses,<sup>18</sup> and imposed a crippling economic sanction program in a “maximum pressure campaign” with more than 1,500 sanctions that targeted individuals and entities that were doing business with Iran.<sup>19</sup> The sanctions were meant to force changes in Iran’s behavior, particularly with regard to its support for terrorist organizations and refusal to renounce a nascent nuclear weapons program.<sup>20</sup>

Many of America’s European allies publicly denounced the Trump Administration’s decision to withdraw from the JCPOA, but most officials agree privately that the agreement is flawed and needs to be fixed. America’s allies in the Middle East, including Israel and most Gulf Arab states, supported the U.S. decision and welcomed a harder line against the Iranian regime.<sup>21</sup>

However, the Biden Administration’s efforts to resurrect the JCPOA threaten to disrupt the gains made by the Trump Administration. On February 18, 2021, the Biden Administration rescinded President Donald Trump’s restoration of U.N. sanctions on Iran, thereby signaling President Joseph Biden’s willingness to negotiate a nuclear agreement with Iran.<sup>22</sup> Indirect talks brokered by the European Union between U.S. and Iranian diplomats in Vienna resumed in April 2021.

From the beginning, Iran has been mounting its own maximum-pressure campaign to force President Biden to lift sanctions and return to the 2015 agreement without imposing conditions. The Administration has lifted sanction designations on several entities and individuals several times over the course of the negotiations to inject momentum but with little to show for it.<sup>23</sup> Unacceptable Iranian demands for non-nuclear sanctions relief, including the lifting of U.S. terrorist sanctions on the Islamic Revolutionary Guard Corps (IRGC), and a guarantee that the International Atomic Energy Agency’s investigation of Iran’s nuclear activities would be ended led to the suspension of negotiations in September 2022.<sup>24</sup>

Despite Iran’s insistence, the Biden Administration has rightly refused to lift the terrorist designations of the IRGC.<sup>25</sup> Anti-regime protests in Iran, sparked by the murder of 22-year-old Mahsa

Amini by the morality police, and Iran's supplying of missiles and drones to Russia have made further negotiations politically difficult.<sup>26</sup> Yet the Biden Administration is currently discussing a "freeze-for-freeze" approach to Iran's nuclear program that would grant partial sanctions relief in exchange for a partial freeze of Iran's nuclear program.<sup>27</sup>

Tehran attempts to run an unconventional empire by exerting great influence on sub-state entities like Hamas in the Palestinian territories, Hezbollah in Lebanon, the Mahdi movement and other Shia militias in Iraq, and the Houthi insurgents in Yemen. The Iranian Quds Force, the special-operations wing of the IRGC, has orchestrated the formation, arming, training, and operations of these sub-state entities as well as other surrogate militias. These Iran-backed militias have carried out terrorist campaigns against U.S. forces and allies in the region for many years.

On January 2, 2020, President Donald Trump ordered an air strike that killed General Qassem Soleimani, leader of the Iranian Quds Force, and Abu Mahdi al-Muhandis, leader of an Iraqi Shia paramilitary group, both of whom had been responsible for carrying out attacks against U.S. personnel in Iraq. Soleimani's and Muhandis's deaths were a huge loss for Iran's regime and its Iraqi proxies. They also were a major operational and psychological victory for the United States.<sup>28</sup> Under the Biden Administration, attacks by Iran's proxies against U.S. forces in the region have increased dramatically. Since President Biden took office, Iranian proxies have carried out drone and rocket attacks against U.S. troops in the region 83 times according to U.S. Central Command. Washington has responded with force only four times.<sup>29</sup>

In Afghanistan, Tehran's influence on some Shiite groups is such that thousands have volunteered to join IRGC-led militias deployed to fight for Bashar al-Assad in Syria.<sup>30</sup> Iran also provided arms to the Taliban after it was ousted from power by a U.S.-led coalition<sup>31</sup> and has long considered the Afghan city of Herat near the Afghanistan-Iran border to be within its sphere of influence. The Biden Administration's disastrous withdrawal from Afghanistan paved the way for a Taliban takeover and a deepening of ties between Tehran and Kabul, increasing Iran's growing influence in the region.

Iran already looms large over its weak and divided Arab rivals. Iraq and Syria have been destabilized

by insurgencies and civil war and may never fully recover, Egypt is distracted by its own internal economic problems, and Jordan has been inundated by a flood of Syrian refugees and is threatened by the instability in Syria.<sup>32</sup> Meanwhile, Tehran has continued to build up its missile arsenal, which is the largest in the Middle East; has continued its efforts to prop up the Assad regime in Syria; and supports Shiite Islamist revolutionaries across the region.<sup>33</sup>

To raise funds for its regional proxies, Iran works with rogue actors in Iraq, Lebanon, and Syria to traffic drugs like Captagon, a psychostimulant that has become the most in-demand narcotic in the region. The more than \$10 billion Captagon trade bankrolls the Bashar al-Assad dictatorship in Syria, Lebanese Hezbollah, and Popular Mobilization Forces in Iraq and has sparked a regional drug war that especially affects Saudi Arabia, Jordan, and other countries in the Persian Gulf.<sup>34</sup> If violence were to break out among rival drug cartels, the effects on the operational environment for U.S. forces could be significant.

Tehran's main partner in the drug trade is Syria's Bashar al-Assad regime, whose brutal repression of peaceful demonstrations early in 2011 ignited a fierce civil war that killed more than half a million people and created a major humanitarian crisis: according to the United Nations High Commissioner for Refugees, "15.3 million people in need of humanitarian and protection assistance in Syria"; "5.3 million Syrian refugees worldwide, of whom 5.5 million hosted in countries near Syria" like Turkey, Lebanon, and Jordan; and "6.8 million internally displaced persons" within Syria.<sup>35</sup> The large refugee populations created by this civil war could become a source of recruits for extremist groups. For example, both the Islamist Hay'at Tahrir al-Sham, formerly known as the al-Qaeda-affiliated Jabhat Fateh al-Sham and before that as the al-Nusra Front, and the self-styled Islamic State (IS), formerly known as ISIS or ISIL and before that as al-Qaeda in Iraq, used the power vacuum created by the war to carve out extensive sanctuaries where they built proto-states and trained militants from a wide variety of other Arab countries, Central Asia, Russia, Europe, Australia, and the United States.<sup>36</sup> At the height of its power, with a sophisticated Internet and social media presence and by capitalizing on the civil war in Syria and sectarian divisions in Iraq, the IS was able to recruit more than 25,000

fighters from outside the region to join its ranks in Iraq and Syria. These foreign fighters included thousands from Western countries, among them the United States.

In 2014, the U.S. announced the formation of a broad international coalition to defeat the Islamic State. By early 2019, the territorial “caliphate” had been destroyed by a U.S.-led coalition of international partners. However, the socioeconomic meltdown of Lebanon and ongoing fighting in Syria present the ideal environment for the IS to reconstitute itself. Multiple reports indicate that the IS is recruiting young men in Tripoli, Lebanon.<sup>37</sup> There is a real danger that IS or other Islamic extremists could capitalize on the security vacuum created by that country’s ongoing deterioration.<sup>38</sup> The fall of Afghanistan has also opened the door for a revival of al-Qaeda in Afghanistan. Rebuilding the group will take time, but al-Qaeda remains a long-term threat to American interests and citizens as well as to the homeland.<sup>39</sup>

Arab–Israeli tensions are another source of regional instability. The repeated breakdown of Israeli–Palestinian peace negotiations has created an even more antagonistic situation. Hamas, the Palestinian branch of the Muslim Brotherhood that has controlled Gaza since 2007, seeks to transform the conflict from a national struggle over sovereignty and territory into a religious conflict in which compromise is denounced as blasphemy. Hamas invokes jihad in its struggle against Israel and seeks to destroy the Jewish state and replace it with an Islamic state.

The signing of the Abraham Accords in 2020 caused a brief spark of hope. These U.S.-brokered agreements normalizing relations between Israel and the UAE, Bahrain, Morocco, and Sudan have created new opportunities for trade, investment, and defense cooperation.<sup>40</sup> To strengthen the Abraham Accords, the U.S., Egypt, the UAE, Bahrain, Morocco, and Israel established the Negev Forum, a new framework for cooperation in the region with six working groups: Clean Energy, Education and Coexistence, Food and Water Security, Health, Regional Security, and Tourism.<sup>41</sup> These efforts are important milestones in the diplomatic march toward a broader Arab–Israeli peace.<sup>42</sup>

However, Israeli–Palestinian tensions have worsened over the past three years. In both April 2021 and 2022, Hamas fired a barrage of rockets

into Israel from Gaza following deadly violence and attacks in Jerusalem’s Old City. Israel responded with air strikes.<sup>43</sup> In 2023, tensions took on a new dimension after days of escalating violence in Jerusalem led to rockets being fired not only by Hamas in Gaza, but also by the Al-Quds Brigades, an armed wing of the Syria-based Palestinian Islamic Jihad.<sup>44</sup> Increased violence threatens the stability of Israel at a time of increased internal division. In March 2023, tens of thousands of Israelis took to the streets to protest judicial reforms proposed by the Netanyahu government.<sup>45</sup> As this book was being prepared, the situation remained tense.

### **Important Alliances and Bilateral Relations in the Middle East**

The U.S. has strong military, security, intelligence, and diplomatic ties with several Middle Eastern nations, including Israel, Egypt, Jordan, and the six members of the Gulf Cooperation Council (GCC): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Because the historical and political circumstances that led to the creation of NATO have been largely absent in the Middle East, the region lacks a similarly strong collective security organization.

In 2017, the Trump Administration proposed the idea of a multilateral Middle East Strategic Alliance with its Arab partners.<sup>46</sup> The initial U.S. concept, which included security, economic cooperation, and conflict resolution and deconfliction, generated considerable enthusiasm, but the project has since been sidelined although discussions are ongoing in Congress with a view to creating some sort of “regional security architecture” within the Abraham Accords framework.<sup>47</sup>

In April 2022, shortly after the March 2022 Negev summit, the U.S. established the 34-nation Combined Task Force 153 “to enhance international maritime security and capacity-building efforts in the Red Sea, Bab al-Mandeb and Gulf of Aden.”<sup>48</sup> Over the spring and summer of 2022, the U.S. organized regional discussions about air-defense cooperation.<sup>49</sup> To build on these agreements, the U.S. will host Negev Forum partners for defense meetings in 2023 that will focus on capacity-building and the sharing of best practices on such issues as border security, disaster preparedness, and climate change. Traditionally, however, Middle Eastern countries have preferred to maintain bilateral relationships

with the U.S. and generally have shunned multi-lateral arrangements because of the lack of trust among Arab states.

This lack of trust manifested itself in June 2017 when the Kingdom of Saudi Arabia, the UAE, Bahrain, Egypt, and several other Muslim-majority countries cut or downgraded diplomatic ties with Qatar after Doha was accused of supporting terrorism in the region.<sup>50</sup> These nations severed all commercial land, air, and sea travel with Qatar and expelled Qatari diplomats and citizens. In January 2021, Saudi Arabia, the UAE, Bahrain, and Egypt agreed to restore ties with Qatar during the 41st Gulf Cooperation Council summit. Per the agreement, Saudi Arabia and its GCC allies lifted the economic and diplomatic blockade of Qatar, reopening their airspace, land, and sea borders. This diplomatic détente paves the way for full reconciliation in the GCC and, at least potentially, a more united front in the Gulf.<sup>51</sup>

Military training is an important part of these relationships. Exercises involving the United States are intended principally to ensure close and effective coordination with key regional partners, demonstrate an enduring U.S. security commitment to regional allies, and train Arab armed forces so that they can assume a larger share of responsibility for regional security.

**Israel.** America's most important bilateral relationship in the Middle East is with Israel. Both countries are democracies, value free-market economies, and believe in human rights at a time when many Middle Eastern countries reject those values. With support from the United States, Israel has developed one of the world's most sophisticated air and missile defense networks.<sup>52</sup> No significant progress on peace negotiations with the Palestinians or on stabilizing Israel's volatile neighborhood is possible without a strong and effective Israeli–American partnership.

Ties between the U.S. and Israel improved significantly during the Trump Administration, encouraged by the relocation of America's embassy from Tel Aviv to western Jerusalem in 2018 and the Administration's role in facilitating the Abraham Accords, which were signed in 2020, and so far have shown no signs of deteriorating under the Biden Administration.<sup>53</sup> Officials have stated, however, that the Abraham Accords are not a substitute for Israeli–Palestinian peace. At the same time, the

Biden Administration has shown little interest in taking an active role in Israeli–Palestinian peace negotiations, explaining instead that it will promote equal rights for Palestinians and Israelis rather than focusing on resolving the overarching dispute.<sup>54</sup> If the conflict between the two sides continues to escalate, President Biden may find himself pressured to become more involved.

**Saudi Arabia.** After Israel, the deepest U.S. military relationship is with the Gulf States, including Saudi Arabia, which serves as de facto leader of the Gulf Cooperation Council. America's relationship with Saudi Arabia is based on pragmatism and is important for both security and economic reasons, but it has come under intense strain since the October 2018 murder of Saudi dissident journalist Jamal Ahmad Khashoggi in the Saudi consulate in Istanbul, Turkey.

The Saudis enjoy huge influence across the Muslim world, and approximately 2 million Muslims participate in the annual Hajj pilgrimage to the holy city of Mecca. Riyadh has been a key partner in efforts to counter the influence of Iran. The U.S. is also the largest provider of arms to Saudi Arabia and regularly, if not controversially, sells munitions needed to resupply stockpiles expended in the Saudi-led campaign against the Houthis in Yemen.

Under the Biden Administration, bilateral relations have significantly deteriorated because the Administration turned a blind eye to Houthi aggression. For example, the Biden Administration lifted the Trump Administration's designation of the Houthi Ansar Allah (Supporters of God) movement as a terrorist organization despite Houthi drone and ballistic missile attacks against military and civilian targets in Saudi Arabia and the UAE. Both Saudi Arabia and the UAE have called for a redesignation of the Houthis, but as this book was being prepared, no such designation had been imposed.<sup>55</sup> The bilateral relationship has deteriorated further over oil production disputes. After OPEC+ decided to cut oil production,<sup>56</sup> the Biden Administration vowed that there would be "consequences" for Saudi Arabia. The Administration has failed to follow through on this threat, which has further strained the relationship between the two countries.

**Gulf Cooperation Council.** The GCC's member countries are located in an oil-rich region close to the Arab–Persian fault line and are therefore strategically important to the U.S.<sup>57</sup> The root of

Arab–Iranian tensions in the Gulf is Iran’s ideological drive to export its Islamist revolution and overthrow the traditional rulers of the Arab kingdoms. This ideological clash has further amplified long-standing sectarian tensions between Shia Islam and Sunni Islam. Tehran has sought to radicalize Shia Arab minority groups to undermine Sunni Arab regimes in Saudi Arabia, Kuwait, Yemen, and Bahrain. It also sought to incite revolts by the Shia majorities in Iraq against Saddam Hussein’s regime and in Bahrain against the Sunni al-Khalifa dynasty. Culturally, many Iranians look down on the Gulf States, many of which they see as artificial entities carved out of the former Persian Empire and propped up by Western powers.

GCC member countries often have difficulty agreeing on a common policy with respect to matters of security. This reflects both the organization’s intergovernmental nature and its members’ desire to place national interests above those of the GCC. The 2017 dispute regarding Qatar illustrates this difficulty.

Another source of disagreement involves the question of how best to deal with Iran. The UAE, Kuwait, and Saudi Arabia, all of which once opposed the Iran nuclear deal, have restored diplomatic relations with Tehran, the UAE and Kuwait in 2022 and Saudi Arabia in a deal brokered by China in March 2023.<sup>58</sup> Bahrain still maintains a hawkish view of the threat from Iran. Oman prides itself on its regional neutrality, and Qatar shares natural gas fields with Iran, so it is perhaps not surprising that both countries view Iran’s activities in the region as less of a threat and maintain cordial relations with Tehran.

**Egypt.** Egypt is another important U.S. military ally. As one of six Arab countries that maintain diplomatic relations with Israel (the others are Jordan, Bahrain, the UAE, Sudan, and Morocco), Egypt is closely enmeshed in the Israeli–Palestinian conflict and remains a leading political, diplomatic, and military power in the region.

Relations between the U.S. and Egypt have been difficult since the downfall of President Hosni Mubarak in 2011 after 30 years in power. The Muslim Brotherhood’s Mohamed Morsi was elected president in 2012 and used the Islamist-dominated parliament to pass a constitution that advanced an Islamist agenda. Morsi’s authoritarian rule, combined with rising popular dissatisfaction with

falling living standards, rampant crime, and high unemployment, led to a massive wave of protests in June 2013 that prompted a military coup in July. The leader of the coup, Field Marshal Abdel Fattah el-Sisi, pledged to restore democracy and was elected president in 2014 and again in 2018 in elections that many considered to be neither free nor fair.

Sisi’s government faces major political, economic, and security challenges. However, because of Egypt’s ban on anti-government demonstrations and Sisi’s tight control of internal security, there was only one outbreak of protests in 2018.<sup>59</sup> Internal security may deteriorate if historically high rates of inflation and bread prices continue to rise—a development that could trigger a new wave of anti-government protests—or if the Islamic State resurges inside Egypt.<sup>60</sup>

### Quality of Armed Forces in the Region

The quality and capabilities of the region’s armed forces are mixed. Some countries spend billions of dollars each year on advanced Western military hardware; others spend very little. Saudi Arabia’s military budget is by far the region’s largest, but in 2021 (the most recent year for which data are available), Oman spent the region’s highest percentage of GDP on defense at 7.3 percent, followed by Kuwait at 6.7 percent. Saudi Arabia dropped down to third in the region at 6.6 percent. Qatar (based on data released for the first time since 2010) spent 4.8 percent of its GDP on defense.<sup>61</sup>

Different security factors drive the degree to which Middle Eastern countries fund, train, and arm their militaries. For Israel, which fought and defeated Arab coalitions in 1948, 1956, 1967, 1973, and 1982, the chief potential threat to its existence is now an Iranian regime that has called for Israel to be “wiped off the map.”<sup>62</sup> States and non-state actors in the region have invested in asymmetric and unconventional capabilities to offset Israel’s military superiority.<sup>63</sup> For the Gulf States, the main driver of defense policy is the Iranian military threat combined with internal security challenges; for Iraq, it is the internal threat posed by Iran-backed militias and Islamic State terrorists.

The Israel Defense Forces (IDF) are considered the most capable military forces in the Middle East. Iran and other Arab countries have spent billions of dollars in an effort to catch up with Israel, but U.S. support preserves Israel’s qualitative military

edge (QME). Iran is steadily improving its missile capabilities and, due to the expiration of the U.N. conventional arms embargo in October 2020, now has access to the global arms trade.<sup>64</sup> In response, Arab countries are upgrading their weapons capabilities while establishing officer training programs to improve military effectiveness.<sup>65</sup>

Israel funds its military sector heavily and has a strong national industrial capacity that is supported by significant funding from the U.S. Combined, these factors give Israel a regional advantage despite limitations of manpower and size. In particular, the IDF has focused on maintaining its superiority in missile defense, intelligence collection, precision weapons, and cyber technologies.<sup>66</sup> The Israelis regard their cyber capabilities as especially important and use cyber technologies for a number of purposes that include defending Israeli cyberspace, gathering intelligence, and carrying out attacks.<sup>67</sup>

In 2010, Israel signed a \$2.7 billion deal with the U.S. to acquire approximately 20 F-35I Adir Lightning fighter jets (the F-35I is a heavily modified version of the Lockheed Martin F-35 stealth fighter).<sup>68</sup> In the 2021 conflict with Hamas, these jets were deployed in a major combat operation that targeted dozens of Hamas rocket launch tubes in northern Gaza.<sup>69</sup> In December 2021, Israel also signed a \$3 billion deal with the U.S. to buy 12 Lockheed Martin–Sikorsky CH-53K helicopters and two Boeing KC-46 refueling planes to replace the Sikorsky CH-53 Yas'ur heavy-lift aircraft that have been in use since the late 1960s. These aircraft would aid Israel in the event of conflict with Iran.<sup>70</sup>

Israel maintains its qualitative superiority in medium-range and long-range missile capabilities and fields effective missile defense systems, including Iron Dome, Arrow, and David's Sling, all of which have benefitted from U.S. financing and technical support.<sup>71</sup> Israel also has a nuclear weapons capability (which it does not publicly acknowledge) that increases its strength relative to other powers in the region and has helped to deter adversaries as the gap in conventional capabilities has been reduced.

After Israel, the most technologically advanced and best-equipped armed forces are found in the GCC countries. Previously, the export of oil and gas meant that there was no shortage of resources to devote to defense spending, but the up-and-down nature of oil prices in recent years may force

oil-exporting countries to adjust their defense spending patterns. Nevertheless, GCC nations still have the region's best-funded (even if not necessarily its most effective) Arab armed forces. All GCC members boast advanced defense hardware that reflects a preference for U.S., United Kingdom (U.K.), and French equipment.

The GCC's most capable military force is Saudi Arabia's: an army of 75,000 soldiers and a National Guard of 130,000 personnel reporting directly to the king. Its army operates 1,010 main battle tanks including 500 U.S.-made M1A2s. Its air force is built around American-built and British-built aircraft and consists of more than 455 combat-capable aircraft that include F-15s, Tornados, and Typhoons.<sup>72</sup>

Air power is the strong suit of most GCC members. Oman, for example, operates F-16s and Typhoons. In 2018, the U.S. government awarded Lockheed Martin a \$1.12 billion contract to produce 16 new F-16 Block 70 aircraft (Lockheed Martin's newest and most advanced F-16 production configuration) for the Royal Bahraini Air Force. Bahrain is expected to receive its first batch of upgraded aircraft in 2024.<sup>73</sup> Qatar operates French-made Mirage fighters and has purchased at least 24 Typhoons from the U.K.<sup>74</sup>

In November 2020, the U.S. Department of State notified Congress that it had approved the sale of a \$23.4 billion defense package of F-35A Joint Strike Fighters, armed drones, munitions, and associated equipment to the UAE.<sup>75</sup> After a temporary freeze on arms sales by the Biden Administration, the sale moved forward in April 2021. The sale is somewhat controversial because of Israeli concerns about other regional powers also possessing the most modern combat aircraft and potentially challenging an important Israeli advantage.

Middle Eastern countries have shown a willingness to use their military capabilities under certain limited circumstances. The navies of GCC member countries rarely deploy beyond their Exclusive Economic Zones (EEZs), but Kuwait, Bahrain, the UAE, Saudi Arabia, and Qatar have participated in and, in some cases, have commanded Combined Task Force 152, formed in 2004 to maintain maritime security in the Persian Gulf.<sup>76</sup> Egypt commands Combined Task Force 153, a 34-nation naval partnership established in 2022, as noted previously, "to enhance international maritime security and capacity-building efforts in the Red Sea, Bab Al-Mandeb



and Gulf of Aden.<sup>77</sup> In 2011, the UAE and Qatar deployed fighters to participate in NATO-led operations over Libya, although they did not participate in strike operations. To varying degrees, all six GCC members also joined the U.S.-led anti-ISIS coalition with the UAE contributing the most in terms of air power.<sup>78</sup> Air strikes in Syria by members of the GCC ended in 2017.

With 438,500 active personnel and 479,000 reserve personnel, Egypt has the region's largest Arab military force.<sup>79</sup> It possesses a fully operational military with an army, air force, air defense, navy, and special operations forces. Until 1979, when the U.S. began to supply Egypt with military equipment, Cairo relied primarily on less capable Soviet military technology.<sup>80</sup> Since then, its army and air force have been significantly upgraded with U.S. military weapons, equipment, and warplanes. Egypt's naval capabilities have also grown with the opening of a naval base at Ras Gargoub and the commissioning of a fourth Type-209/1400 submarine and a second FREMM frigate.<sup>81</sup>

Egypt has struggled with increased terrorist activity in the Sinai Peninsula, including attacks on Egyptian soldiers and foreign tourists and the October 2015 bombing of a Russian airliner departing from the Sinai. The Islamic State's Sinai Province terrorist group has claimed responsibility for all of these actions.<sup>82</sup> Although the Egyptian army regained control of two IS-controlled villages, militant attacks against army affiliates in different parts of North Sinai and the kidnapping of tribal leaders threaten the stability of the area.<sup>83</sup>

The Hashemite Kingdom of Jordan is a close U.S. ally, and its military forces, while small, are effective. The principal threats to Jordan's security include terrorism, political turbulence, refugees, and the trade in Captagon spilling over from Syria and Iraq. Although Jordan faces few conventional threats from its neighbors, its internal security is threatened by Islamist extremists who have fought in the region and have been emboldened by the growing influence of al-Qaeda and other Islamist militants. As a result, Jordan's highly professional armed forces have had to focus on border and internal security in recent years.

Considering Jordan's size, its conventional capability is significant. Jordan's ground forces total 86,000 soldiers and include 182 British-made Challenger 1 tanks and several French-made Leclerc

tanks. Two squadrons of F-16 Fighting Falcons form the backbone of its air force,<sup>84</sup> and its special operations forces are highly capable, having benefitted from extensive U.S. and U.K. training. Jordanian forces have served in Afghanistan and in numerous U.N.-led peacekeeping operations.

Iraq has fielded one of the region's most dysfunctional military forces. After the withdrawal of U.S. troops in 2011, Iraq's government selected and promoted military leaders according to political criteria.<sup>85</sup> Shiite army officers were favored over their Sunni, Christian, and Kurdish counterparts, and former Prime Minister Nouri al-Maliki chose top officers according to their political loyalties. Politicization of the armed forces also encouraged corruption within many units with some commanders siphoning off funds allocated for "ghost soldiers" who never existed or had been separated from the army for various reasons.<sup>86</sup>

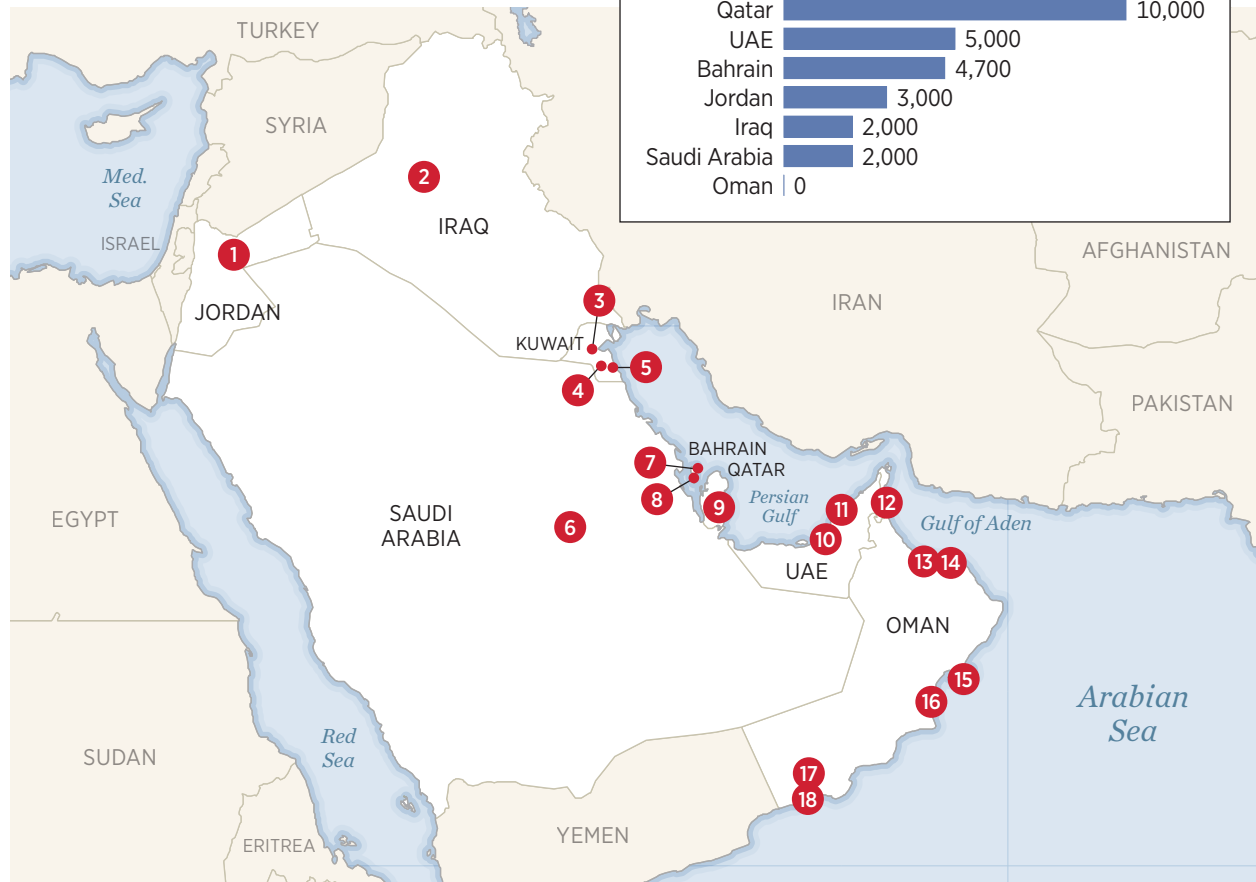
The promotion of incompetent military leaders, poor logistical support because of corruption and other problems, limited operational mobility, and weaknesses in intelligence, reconnaissance, medical support, and air force capabilities have combined to undermine the effectiveness of Iraq's armed forces. In June 2014, for example, the collapse of as many as four divisions that were routed by vastly smaller numbers of Islamic State fighters led to the fall of Mosul.<sup>87</sup> The U.S. and its allies responded with a massive training program for the Iraqi military that led to the liberation of Mosul on July 9, 2017.<sup>88</sup>

Since 2017, the capabilities and morale of Iraq's armed forces have improved, but there is still concern about Baghdad's ability to sustain operational effectiveness in the face of the current U.S. drawdown and redeployment of forces. The continued presence of armed militias presents the biggest obstacle to force unity.<sup>89</sup>

### **Current U.S. Military Presence in the Middle East**

Before 1980, the limited U.S. military presence in the Middle East consisted chiefly of a small naval force that had been based in Bahrain since 1958. The U.S. "twin pillar" strategy relied on prerevolutionary Iran and Saudi Arabia to take the lead in defending the Persian Gulf from the Soviet Union and its client regimes in Iraq, Syria, and South Yemen,<sup>90</sup> but the 1979 Iranian revolution demolished

## U.S. Access to Bases and Facilities in the Middle East



- |   |  |   |   |
|---|--|---|---|
| <p><b>JORDAN</b></p> <ul style="list-style-type: none"> <li>1 Muwaffaq Salti Airbase</li> </ul> <p><b>IRAQ</b></p> <ul style="list-style-type: none"> <li>2 al-Asad Air Base</li> </ul> <p><b>KUWAIT</b></p> <ul style="list-style-type: none"> <li>3 Ali al-Salem Air Base</li> <li>4 Ahmad al-Jabir Air Base</li> <li>5 Camp Arifjan</li> </ul> | <p><b>SAUDI ARABIA</b></p> <ul style="list-style-type: none"> <li>6 Eskan Village Air Base</li> </ul> <p><b>BAHRAIN</b></p> <ul style="list-style-type: none"> <li>7 Khalifa bin Salman Port</li> <li>8 Shaykh Isa Air Base</li> </ul> <p><b>QATAR</b></p> <ul style="list-style-type: none"> <li>9 Al Udeid Air Base</li> </ul> | <p><b>UNITED ARAB EMIRATES</b></p> <ul style="list-style-type: none"> <li>10 Al-Dhafra Air Base</li> <li>11 Jebel Ali Port</li> <li>12 Fujairah Naval Base</li> </ul> | <p><b>OMAN</b></p> <ul style="list-style-type: none"> <li>13 Musnanah Air Base</li> <li>14 Muscat International Airport</li> <li>15 RAFO Masirah</li> <li>16 Al Duqm Port</li> <li>17 RAFO Thumrait</li> <li>18 Salah Port</li> </ul> |
|---|--|---|---|

**SOURCES:** International Institute for Strategic Studies, *The Military Balance 2023: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2023), and Heritage Foundation research.

one pillar, and the December 1979 Soviet invasion of Afghanistan increased the Soviet threat to the Gulf.

In January 1980, President Jimmy Carter proclaimed in a commitment known as the Carter Doctrine that the United States would take military action to defend oil-rich Persian Gulf States from external aggression. In 1980, he ordered the creation of the Rapid Deployment Joint Task Force (RDJTF), the precursor to U.S. Central Command (USCENTCOM), which was established in January 1983.<sup>91</sup>

Until the late 1980s, according to USCENTCOM, America’s “regional strategy still largely focused on the potential threat of a massive Soviet invasion of Iran.”<sup>92</sup> After the collapse of the Soviet Union, Saddam Hussein’s Iraqi regime became the chief threat to regional stability. Iraq invaded Kuwait in August 1990, and the United States responded in January 1991 by leading an international coalition of more than 30 nations to expel Saddam’s forces from Kuwait. CENTCOM commanded the U.S. contribution of more than 532,000 military personnel to the coalition’s armed forces, which totaled at least 737,000.<sup>93</sup> This marked the peak U.S. force deployment in the Middle East.

Confrontations with Iraq continued throughout the 1990s as Iraq continued to violate the 1991 Gulf War cease-fire. Baghdad’s failure to cooperate with U.N. arms inspectors to verify the destruction of its weapons of mass destruction and its links to terrorism led to the U.S. invasion of Iraq in 2003. During the initial invasion, U.S. forces numbered nearly 192,000,<sup>94</sup> joined by military personnel from coalition forces. Apart from the “surge” in 2007, when President George W. Bush deployed an additional 30,000 personnel, the number of American combat forces in Iraq fluctuated between 100,000 and 150,000.<sup>95</sup>

In December 2011, the U.S. officially completed its withdrawal of troops, leaving only 150 personnel attached to the U.S. embassy in Iraq.<sup>96</sup> Later, in the aftermath of IS territorial gains in Iraq, the U.S. redeployed thousands of troops to the country to assist Iraqi forces against IS and help to build Iraqi capabilities.

In 2021, the Biden Administration brought America’s combat mission in Iraq to a close and transitioned U.S. forces involvement to an advisory role. U.S. force levels in Iraq declined from 5,200 in 2020 to 2,500 in January 2021.<sup>97</sup> CENTCOM

Commander General Frank McKenzie stated that “[a]s we look into the future, any force level adjustment in Iraq is going to be made as a result of consultations with the government of Iraq.”<sup>98</sup>

The U.S. continues to maintain a limited number of forces in other locations in the Middle East, primarily in GCC countries. Rising naval tensions in the Persian Gulf prompted the additional deployments of troops, Patriot missile batteries, and combat aircraft to the Gulf in late 2019 to deter Iran, but most were later withdrawn.<sup>99</sup> In August 2022, it was reported that the U.S. State Department had “approved more than \$5 billion in arms deals for key Middle East partners, including \$3.05 billion in Patriot missiles for Saudi Arabia” to defend itself “against persistent Houthi cross-border unmanned aerial system and ballistic missile attacks on civilian sites and critical infrastructure” and “\$2.25 billion in THAAD [Terminal High Altitude Area Defense] systems for the United Arab Emirates.”<sup>100</sup>

By January 2022, CENTCOM had deployed an estimated 40,000 to 60,000 U.S. troops in 21 countries within its area of responsibility.<sup>101</sup> Although the exact disposition of U.S. forces is hard to triangulate because of the fluctuating nature of U.S. military operations in the region,<sup>102</sup> information gleaned from open sources reveals the following:

- **Kuwait.** More than 13,500 U.S. personnel are based in Kuwait and spread among Camp Arifjan, Ahmad al-Jabir Air Base, and Ali al-Salem Air Base. A large depot of prepositioned equipment and a squadron of fighters and Patriot missile systems are also deployed to Kuwait.<sup>103</sup>
- **United Arab Emirates.** About 3,500 U.S. personnel are deployed at Jebel Ali port, Al Dhafra Air Base, and naval facilities at Fujairah. Jebel Ali port is the U.S. Navy’s busiest port of call for aircraft carriers. U.S. Air Force personnel who are stationed in the UAE use Al Dhafra Air Base to operate fighters, unmanned aerial vehicles (UAVs), refueling aircraft, and surveillance aircraft. In addition, the United States has regularly deployed F-22 Raptor combat aircraft to Al Dhafra and in April 2021 deployed the F-35 combat aircraft because of escalating tensions with Iran. Patriot and THAAD missile systems are deployed for air and missile defense.<sup>104</sup>

- **Oman.** In 1980, Oman became the first Gulf State to welcome a U.S. military base. Today, it provides important access in the form of over 5,000 aircraft overflights, 600 aircraft landings, and 80 port calls annually. The number of U.S. military personnel in Oman has fallen to a few hundred, mostly from the U.S. Air Force. According to the Congressional Research Service, a March 2019 U.S.–Oman Strategic Framework Agreement “expand[ed] the U.S.–Oman facilities access agreements by allowing U.S. forces to use the ports of Al Duqm, which is large enough to handle U.S. aircraft carriers, and Salalah.” In addition, “Oman is trying to expand and modernize its arsenal primarily with purchases from the United States. As of June 2021, the United States ha[d] 72 active cases valued at \$2.7 billion with Oman under the government-to-government Foreign Military Sales (FMS) system.”<sup>105</sup>
- **Bahrain.** More than 9,000 U.S. military personnel are based in Bahrain. Because Bahrain is home to Naval Support Activity Bahrain and the U.S. Fifth Fleet, most U.S. military personnel there belong to the U.S. Navy. A significant number of U.S. Air Force personnel operate out of Shaykh Isa Air Base, where F-16s, F/A-18s, and P-8 surveillance aircraft are stationed. U.S. Patriot missile systems also are deployed to Bahrain. The deep-water port of Khalifa bin Salman is one of the few facilities in the Gulf that can accommodate U.S. aircraft carriers. In 2021, Bahrain became an operational hub for the use of new artificial intelligence technology to direct Unmanned Surface Vessels and unmanned underwater vehicles in the CENTCOM area of responsibility.<sup>106</sup>
- **Saudi Arabia.** In June 2021, President Biden reported to Congress that approximately 2,700 U.S. military personnel were deployed in Saudi Arabia “to protect United States forces and interests in the region against hostile action by Iran or Iran-backed groups.” The President confirmed that these troops, “operating in coordination with the Government of the Kingdom of Saudi Arabia, provide air and missile defense capabilities and support the operation of United States fighter aircraft.”<sup>107</sup> The six-decade-old United States Military Training Mission to the Kingdom of Saudi Arabia, the four-decade-old Office of the Program Manager of the Saudi Arabian National Guard Modernization Program, and the Office of the Program Manager–Facilities Security Force are based in Eskan Village Air Base approximately 13 miles south of the capital city of Riyadh.<sup>108</sup>
- **Qatar.** The number of U.S. personnel, mainly from the U.S. Air Force, deployed in Qatar “has ranged from about 8,000 to over 10,000.”<sup>109</sup> The U.S. operates its Combined Air Operations Center at Al Udeid Air Base, which is one of the world’s most important U.S. air bases. It is also the base from which the anti-ISIS campaign was headquartered. Heavy bombers, tankers, transports, and ISR (intelligence, surveillance, and reconnaissance) aircraft operate from Al Udeid Air Base, which also serves as the forward headquarters of CENTCOM. The base houses prepositioned U.S. military equipment and is defended by U.S. Patriot missile systems. The recent tensions between Qatar and other Arab states have not affected the United States’ relationship with Qatar.
- **Jordan.** According to CENTCOM, “the Jordanian Armed Forces is one of [America’s] strongest and most reliable partners in the Levant sub-region.”<sup>110</sup> Although there are no U.S. military bases in Jordan, the U.S. has a long history of conducting training exercises out of Jordanian air bases. The Congressional Research Service has reported that “Jordanian air bases have been particularly important for the U.S. conduct of intelligence, surveillance, target acquisition, and reconnaissance (ISR) missions in Syria and Iraq” and that “[a]s of June 2022...approximately 2,833 United States military personnel [were] deployed to Jordan to counter the Islamic State and enhance Jordan’s security.”<sup>111</sup> In addition:
 

Beyond the need to use Jordanian facilities to counter the Islamic State throughout the region, CENTCOM may seek to partner more closely with Jordan in order to position U.S. materiel to counter Iran. In summer 2021, the U.S. Department of Defense announced that

equipment and materiel previously stored at a now-closed U.S. base in Qatar would be moved to Jordan.<sup>112</sup>

CENTCOM “directs and enables military operations and activities with allies and partners to increase regional security and stability in support of enduring U.S. interests.”<sup>113</sup> Execution of this mission is supported by four service component commands (U.S. Naval Forces Middle East [USNAVCENT]; U.S. Army Forces Middle East [USARCENT]; U.S. Air Forces Middle East [USAFCENT]; and U.S. Marine Forces Middle East [MARCENT]) and one subordinate unified command (U.S. Special Operations Command Middle East [SOCCENT]).

- **U.S. Naval Forces Central Command.** USNAVCENT is USCENTCOM’s maritime component. With its forward headquarters in Bahrain, it is responsible for commanding the afloat units that rotationally deploy or surge from the United States in addition to other ships that are based in the Gulf for longer periods. USNAVCENT conducts persistent maritime operations to advance U.S. interests, deter and counter disruptive countries, defeat violent extremism, and strengthen partner nations’ maritime capabilities in order to promote a secure maritime environment in an area that encompasses approximately 2.5 million square miles of water.
- **U.S. Army Forces Central Command.** USARCENT is USCENTCOM’s land component. Based in Kuwait, it is responsible for land operations in an area that totals 4.6 million square miles (1.5 times larger than the continental United States).
- **U.S. Air Forces Central Command.** USAFCENT is USCENTCOM’s air component. Based in Qatar, it is responsible for air operations and for working with the air forces of partner countries in the region. It also manages an extensive supply and equipment prepositioning program at several regional sites.
- **U.S. Marine Forces Central Command.** MARCENT is USCENTCOM’s designated Marine Corps service component. Based in

Bahrain, it is responsible for all Marine Corps forces in the region.

- **U.S. Special Operations Command Central.** SOCCENT is a subordinate unified command under USCENTCOM. Based in Qatar, it is responsible for planning special operations throughout the USCENTCOM region, planning and conducting peacetime joint/combined special operations training exercises, and orchestrating command and control of peacetime and wartime special operations.

In addition to the American military presence in the region, two NATO allies—the United Kingdom and France—play an important role.

The U.K.’s presence in the Middle East is a legacy of British imperial rule. The U.K. has maintained close ties with many countries that it once ruled and has conducted military operations in the region for decades. As of 2020, approximately 1,350 British service personnel were based throughout the region.<sup>114</sup> This number fluctuates with the arrival of visiting warships.

The British presence in the region is dominated by the Royal Navy. Permanently based naval assets include four mine hunters and one Royal Fleet Auxiliary supply ship. In addition, there generally are frigates or destroyers in the Gulf or Arabian Sea performing maritime security duties,<sup>115</sup> and (although such matters are not the subject of public discussion) U.K. attack submarines also operate in the area. In April 2018, as a sign of its long-term maritime presence in the region, the U.K. opened a base in Bahrain—its first overseas military base in the Middle East in more than four decades.<sup>116</sup> The U.K. has made a multimillion-dollar investment in modernization of the Duqm Port complex in Oman to accommodate its new *Queen Elizabeth*-class aircraft carriers.<sup>117</sup>

The U.K. also has a small Royal Air Force (RAF) presence in the region, mainly in the UAE and Oman. A short drive from Dubai, Al-Minhad Air Base is home to a small contingent of U.K. personnel, and small RAF detachments in Oman support U.K. and coalition operations in the region. Although considered to be in Europe, the U.K.’s Sovereign Base Areas of Akrotiri and Dhekelia in Cyprus have supported U.S. military and intelligence operations in the past and are expected to continue to do so.

Moreover, the British presence in the region is not limited to soldiers, ships, and planes. A British-run staff college operates in Qatar, and Kuwait chose the U.K. to help run its own equivalent of the Royal Military Academy at Sandhurst.<sup>118</sup> The U.K. also plays a very active role in training the Saudi Arabian and Jordanian militaries.

The French presence in the Gulf is smaller than the U.K.'s but still significant. France opened its first military base in the Gulf in 2009. Located in the emirate of Abu Dhabi, it was the first foreign military installation built by the French in 50 years.<sup>119</sup> The French have 700 personnel based in the UAE along with seven Rafale jets and an armored battle-group, as well as military operations in Iraq, Saudi Arabia, and Qatar.<sup>120</sup> French ships have access to the Zayed Port in Abu Dhabi, which is big enough to handle every ship in the French Navy except the aircraft carrier *Charles De Gaulle*.

Military support from the U.K. and France has been particularly important in Operation Inherent Resolve, a U.S.-led joint task force that was formed to combat the Islamic State in Iraq and Syria. As of May 2021, France had between 600 and 650 troops stationed in the UAE; 600 stationed in Jordan, Syria, and Iraq; and 650 stationed in Lebanon.<sup>121</sup> The U.K. temporarily redeployed troops back to the U.K. because of COVID-19 but announced in February 2021 that 500 troops would be sent back along with an additional 3,500 troops to boost its counterterrorism training mission in Iraq.<sup>122</sup> The additional troops will help both to prevent the IS from returning and to manage threats from Iran-backed militias more effectively.

Another important actor in Middle East security is the small East African country of Djibouti. Djibouti sits on the Bab el-Mandeb Strait, through which an estimated 6.2 million barrels of oil a day transited in 2018 (the most recent year for which U.S. Energy Administration data are available) and which is a choke point on the route to the Suez Canal.<sup>123</sup> An increasing number of countries recognize Djibouti's value as a base from which to project maritime power and launch counterterrorism operations. The country is home to Camp Lemonnier, which can hold as many as 4,000 personnel and is the only permanent U.S. military base in Africa.<sup>124</sup>

China is also involved in Djibouti and has established its first permanent overseas base there. This base can house 10,000 troops, and Chinese marines have used it to stage live-fire exercises featuring

armored combat vehicles and artillery. France, Italy, and Japan also have presences of varying strength in Djibouti.<sup>125</sup>

### **Key Infrastructure and Warfighting Capabilities**

The Middle East is critically situated geographically. Two-thirds of the world's population lives within an eight-hour flight from the Gulf region, making it accessible from most other regions of the globe. The Middle East also contains some of the world's most critical maritime choke points, including the Suez Canal and the Strait of Hormuz.

Although infrastructure is not as developed in the Middle East as it is in North America or Europe, during a decades-long presence, the U.S. has developed systems that enable it to move large numbers of matériel and personnel into and out of the region. According to the Department of Defense, at the height of U.S. combat operations in Iraq during the Second Gulf War, the U.S. presence included 165,000 servicemembers and 505 bases. Moving personnel and equipment out of the country was "the largest logistical drawdown since World War II" and included redeployment of "the 60,000 troops who remained in Iraq at the time and more than 1 million pieces of equipment ahead of their deadline."<sup>126</sup>

The condition of the region's roads varies from country to country. All of the roads in Israel, Jordan, and the UAE are paved. Other nations—for example, Oman (60,230 km); Saudi Arabia (221,372 km); and Yemen (71,300 km)—have poor paved road coverage.<sup>127</sup> Rail coverage is also poor. China's Belt and Road Initiative has targeted ports, roads, and railway development in Syria, Iraq, Egypt, and many other countries, and the result could be improved transportation conditions across the region at the expense of U.S. interests.<sup>128</sup>

The U.S. has access to several airfields in the region. The primary air hub for U.S. forces is Al Udeid Air Base in Qatar. Other airfields include Ali Al Salem Air Base in Kuwait; Al Dhafra and Al Minhad in the UAE; Isa in Bahrain; Eskan Village Air Base in Saudi Arabia; and Muscat, Thumrait, Masirah Island, and the commercial airport at Seeb in Oman. In the past, the U.S. has used major airfields in Iraq, including Baghdad International Airport and Balad Air Base, as well as Prince Sultan Air Base in Saudi Arabia.

The fact that a particular air base is available to the U.S. today, however, does not necessarily mean that it will be available for a particular operation in the future. For example, because of their more cordial relations with Iran, Qatar and Oman probably would not allow the U.S. to use air bases in their territory for strikes against Iran unless they were first attacked themselves.

The U.S. also has access to ports in the region, the most important of which may be the deep-water port of Khalifa bin Salman in Bahrain and naval facilities at Fujairah in the UAE.<sup>129</sup> The UAE's commercial port of Jebel Ali is open for visits from U.S. warships and the prepositioning of equipment for operations in theater.<sup>130</sup>

In March 2019, "Oman and the United States signed a 'Strategic Framework Agreement' that expands the U.S.-Oman facilities access agreements by allowing U.S. forces to use the ports of Al Duqm, which is large enough to handle U.S. aircraft carriers, and Salalah."<sup>131</sup> The location of these ports outside the Strait of Hormuz makes them particularly useful. Approximately 90 percent of the world's trade travels by sea, and some of the busiest and most important shipping lanes are located in the Middle East. Tens of thousands of cargo ships travel through the Strait of Hormuz and the Bab el-Mandeb Strait each year.

Given the high volume of maritime traffic in the region, no U.S. military operation can be undertaken without consideration of the opportunity and risk that these shipping lanes offer to America and her allies. The major shipping routes include:

- **The Suez Canal.** In 2022, more than 22,000 ships transited the Suez Canal—an average of 60 ships per day.<sup>132</sup> Considering that the canal itself is 120 miles long but only 670 feet wide, this is an impressive amount of traffic. The Suez Canal is important to Europe because it provides access to oil from the Middle East. It also serves as an important strategic asset for the United States, as it is used routinely by the U.S. Navy to move surface combatants between the Mediterranean Sea and the Red Sea. Thanks to a bilateral arrangement between Egypt and the United States, the U.S. Navy enjoys priority access to the canal.<sup>133</sup>

The journey through the narrow waterway is no easy task for large surface combatants.

The canal was not constructed with the aim of accommodating 100,000-ton aircraft carriers and therefore exposes a larger ship to attack. For this reason, different types of security protocols are followed, including the provision of air support by the Egyptian military.<sup>134</sup> These security protocols, however, are not foolproof. In April 2021, the Suez Canal was closed for more than 11 days after a container ship blocked the waterway, creating a 360-ship traffic jam that disrupted almost 13 percent of global maritime traffic. This crisis proves that ever-larger container ships transiting strategic choke points are prone to accidents that can lead to massive disruptions of both global maritime trade and U.S. maritime security.<sup>135</sup>

- **Strait of Hormuz.** According to the U.S. Energy Information Administration, the Strait of Hormuz, which links the Persian Gulf with the Arabian Sea and the Gulf of Oman, "is the world's most important oil chokepoint because of the large volumes of oil that flow through the strait."<sup>136</sup> In 2020, its daily oil flow averaged "around 18 million barrels" per day, or the equivalent of about "[o]ne fifth of global oil supply."<sup>137</sup>

Given the extreme narrowness of the passage and its proximity to Iran, shipping routes through the Strait of Hormuz are particularly vulnerable to disruption. Since 2021, Iran has harassed, attacked, and interfered with 15 internationally flagged merchant ships according to the White House and the Pentagon. More recently, in April and May 2023, Iran seized two oil tankers. In response, the U.S. Navy warships stationed in the Persian Gulf increased their patrols.<sup>138</sup> The U.S. needs a naval presence and port access to countries that border the Strait of Hormuz to maintain awareness of Iran's illicit drug and weapons smuggling.<sup>139</sup>

- **Bab el-Mandeb Strait.** The Bab el-Mandeb Strait is a strategic waterway located between the Horn of Africa and Yemen that links the Red Sea to the Indian Ocean. Exports from the Persian Gulf and Asia that are destined for Western markets must pass through the strait en route to the Suez Canal. Because the Bab el-Mandeb Strait is 18

miles wide at its narrowest point, passage is limited to two channels for inbound and outbound shipments.<sup>140</sup>

**Maritime Prepositioning of Equipment and Supplies.** The U.S. military has deployed noncombatant maritime prepositioning ships (MPS) containing large amounts of military equipment and supplies in strategic locations from which they can reach areas of conflict relatively quickly as associated U.S. Army or Marine Corps units located elsewhere arrive in the area. The British Indian Ocean Territory of Diego Garcia, an island atoll, hosts the U.S. Naval Support Facility Diego Garcia, which supports prepositioning ships that can supply Army or Marine Corps units deployed for contingency operations in the Middle East.

## Conclusion

For the foreseeable future, the Middle East region will remain a key focus for U.S. military planners. Once considered relatively stable, mainly because of the ironfisted rule of authoritarian regimes, the area is now highly unstable and a breeding ground for terrorism.

Overall, regional security has deteriorated in recent years. Even though the Islamic State (or at least its physical presence) appears to have been defeated, Iran is a formidable regional menace. Iraq has restored its territorial integrity since the defeat of ISIS, but the political situation and future relations between Baghdad and the U.S. will remain difficult as long as Iran retains control of powerful Shia militias that it uses to intimidate Iraqi political leaders.<sup>141</sup> Although the regional dispute with Qatar has been resolved, U.S. relations in the region will remain complex and difficult to manage. U.S. military operations, however, continue uninterrupted.

Many of the borders created after World War I are under significant stress. In countries like Iraq, Lebanon, Libya, Syria, and Yemen, the supremacy of the nation-state is being challenged by non-state actors that wield influence, power, and resources comparable to those of small states. The region's

principal security and political challenges are linked to the unrealized aspirations of the Arab Spring, surging transnational terrorism, and meddling by Iran, which seeks to extend its influence in the Islamic world. These challenges are made more difficult by the Arab–Israeli conflict, Sunni–Shia sectarian divides, the rise of Iran's Islamist revolutionary nationalism, and the proliferation of Sunni Islamist revolutionary groups. In addition, the China-brokered rapprochement between Iran and Saudi Arabia and Beijing's regionwide infrastructure investments are a warning to U.S. policymakers that neglect of long-standing allies leaves behind power vacuums that America's enemies are only too capable of exploiting to their own advantage.

For decades, the United States has relied on its incomparable ability to project power in response to crises, and many U.S. operations and contingency plans depend on time-phased force deployment from the continental U.S. to operations theaters. This requires secure air and sea lanes of communication as well as secure air and sea bases of debarkation. Neither is assured in a theater conflict as Iran now possesses the ability to threaten three of the region's strategic choke points (the Strait of Hormuz, Bab al-Mandeb, and the Suez Canal) as well as U.S. bases and ports along the Arabian Sea within range of a growing and increasingly accurate Iranian ballistic missile inventory.<sup>142</sup>

Thanks to its decades of military operations in the Middle East, the U.S. has developed tried-and-tested procedures for operating in the region. Personal links between allied armed forces are also present. Joint training exercises improve interoperability, and U.S. military educational courses that are regularly attended by officers (and often royals) from the Middle East give the U.S. an opportunity to influence some of the region's future leaders.

America's relationships in the region are based pragmatically on shared security and economic concerns. As long as these issues remain relevant to both sides, the U.S. is likely to benefit from cooperation with partners and allies in the Middle East when shared interests are threatened.

## Scoring the Middle East Operating Environment

As noted at the beginning of this section, various aspects of the region facilitate or inhibit the

ability of the U.S. to conduct military operations to defend its vital national interests against threats.



Our assessment of the operating environment uses a five-point scale that ranges from “very poor” to “excellent” conditions and covers four regional characteristics of greatest relevance to the conduct of military operations:

- **Very Poor.** Significant hurdles exist for military operations. Physical infrastructure is insufficient or nonexistent, and the region is politically unstable. The U.S. military is poorly placed or absent, and alliances are nonexistent or diffuse.
- **Unfavorable.** A challenging operating environment for military operations is marked by inadequate infrastructure, weak alliances, and recurring political instability. The U.S. military is inadequately placed in the region.
- **Moderate.** A neutral to moderately favorable operating environment is characterized by adequate infrastructure, a moderate alliance structure, and acceptable levels of regional political stability. The U.S. military is adequately placed.
- **Favorable.** A favorable operating environment includes adequate infrastructure, strong alliances, and a stable political environment. The U.S. military is well placed for future operations.
- **Excellent.** An extremely favorable operating environment includes well-established and well-maintained infrastructure, strong and capable allies, and a stable political environment. The U.S. military is well placed to defend U.S. interests.

The key regional characteristics consist of:

- **Alliances.** Alliances are important for interoperability and collective defense, as allies are more likely to lend support to U.S. military operations. Indicators that provide insight into the strength or health of an alliance include whether the U.S. trains regularly with countries in the region, has good interoperability with the forces of an ally, and shares intelligence with nations in the region.

- **Political Stability.** Political stability brings predictability for military planners when considering such things as transit, basing, and overflight rights for U.S. military operations. The overall degree of political stability indicates whether U.S. military actions would be hindered or enabled and reflects, for example, whether transfers of power are generally peaceful and whether there have been any recent instances of political instability in the region.
- **U.S. Military Positioning.** Having military forces based or equipment and supplies staged in a region greatly facilitates the ability of the United States to respond to crises and presumably to achieve success in critical “first battles” more quickly. Being routinely present in a region also helps the U.S. to remain familiar with its characteristics and the various actors that might either support or try to thwart U.S. actions. With this in mind, we assessed whether or not the U.S. military was well positioned in the region. Again, indicators included bases, troop presence, prepositioned equipment, and recent examples of military operations (including training and humanitarian) launched from the region.
- **Infrastructure.** Modern, reliable, and suitable infrastructure is essential to military operations. Airfields, ports, rail lines, canals, and paved roads enable the U.S. to stage, launch, and logistically sustain combat operations. We combined expert knowledge of regions with publicly available information on critical infrastructure to arrive at our overall assessment of this metric.<sup>143</sup>

The U.S. has developed an extensive network of bases in the Middle East region and has acquired substantial operational experience in combatting regional threats. At the same time, however, many of America’s allies are hobbled by political instability, economic problems, internal security threats, and mushrooming transnational threats. Although the region’s overall score remains “moderate,” as it was last year, it is in danger of falling to “poor” because of political instability and growing bilateral tensions with allies over the security implications of the proposed nuclear agreement with Iran and how best to fight the Islamic State.

With this in mind, we arrived at these average scores for the Middle East (rounded to the nearest whole number):

- Alliances: **3—Moderate**
- Political Stability: **2—Unfavorable**
- U.S. Military Positioning: **3—Moderate**
- Infrastructure: **3—Moderate**

Leading to a regional score of: **Moderate**

### Operating Environment: Middle East

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             | ✓        |           |           |
| Political Stability   |           | ✓           |          |           |           |
| U.S. Military Posture |           |             | ✓        |           |           |
| Infrastructure        |           |             | ✓        |           |           |
| <b>OVERALL</b>        |           |             | ✓        |           |           |

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# Asia

Jeff M. Smith, Bruce Klingner, Michael Cunningham,  
Bryan Burack, and Andrew J. Harding

Asia has always been vital to the protection and advancement of America’s economic and security interests. One of the first ships to sail under an American flag was the aptly named *Empress of China*, which inaugurated America’s participation in the lucrative China trade in 1784. In the more than two centuries since then, the United States government has maintained that allowing any single nation to dominate Asia would be against America’s interests. The region is home to too many important markets and resources for the United States to be denied access. Thus, beginning with U.S. Secretary of State John Hay’s “Open Door” policy toward China in the 19th century, the United States has worked to prevent the rise of a regional hegemon in Asia, whether it was imperial Japan, the Soviet Union, or China itself.

In the 21st century, Asia’s importance to the United States has continued to grow. Asia is a key source of natural resources and plays a crucial role in countless global supply chains. The sea lines of communication that run through the Pacific and Indian Oceans host the vast majority of sea-borne global trade. Today, six of America’s top 10 trading partners are found in Asia, including China (third); Japan (fourth); South Korea (sixth); Vietnam (seventh); India (ninth); and Taiwan (tenth).<sup>1</sup> The extent of America’s economic integration with Asia and Asian supply chains was demonstrated most starkly by the COVID-19 pandemic as the American economy struggled with import shortages of essential goods including basic pharmaceutical products and key electronics components.

The U.S. also has several key security interests in Asia, including a variety of treaty allies and

important security partners. The region has several of the world’s largest and most capable militaries, including those of China, India, Japan, Russia, Pakistan, and North and South Korea. Additionally, five Asian states—China, North Korea, India, Pakistan, and Russia—possess nuclear weapons.

The region is a focus of American security concerns for a variety of reasons:

- The region has a notable legacy of conflict: Both of the two major “hot” wars fought by the United States during the Cold War—Korea and Vietnam—were fought in Asia.
- The region is home to America’s top external security threat—China.
- The region is characterized by a number of military flashpoints, territorial disputes, and rivalries, including the India–Pakistan dispute over Kashmir, persistent tensions with North Korea, and a wide variety of active territorial disputes between China and its neighbors, including Taiwan, Japan, India, the Philippines, Bhutan, Vietnam, and Indonesia. Lesser territorial disputes also exist between Japan and Russia and between Korea and Japan.

Several of these unresolved differences could devolve into war. Growing Chinese air and sea incursions around Taiwan and indications that General Secretary Xi Jinping has ordered the People’s Liberation Army to be prepared for an invasion of the island by 2027 have generated increased concern about the potential for military conflict in the

Taiwan Strait. The situation on the Korean Peninsula remains perpetually tense with Pyongyang expanding its missile arsenal and testing increasingly capable long-range missiles annually. China's growing and increasingly potent naval capabilities, bolstered by a massive "maritime militia," are also generating alarm in Washington and among numerous treaty allies and security partners. Meanwhile, the disputed China-India border has grown considerably more volatile since a series of violent and deadly confrontations in 2020.

Contributing further to instability, the region lacks a robust political-security architecture. There is no Asian equivalent of NATO despite an ultimately failed mid-20th century effort to forge a parallel multilateral security architecture through the Southeast Asia Treaty Organization (SEATO). Regional diplomatic forums like the ASEAN Regional Forum (ARF) and groupings like the ASEAN Defense Ministers Meeting-Plus (ADMM-Plus) constitute the patchwork political architecture.

The Asian security landscape has been marked by a combination of bilateral alliances, mostly centered on the United States, and efforts by individual nations to maintain their own security. In recent years, these core aspects of the regional security architecture have been supplemented by "minilateral" consultations like the U.S.-Japan-Australia and India-Japan-Australia trilaterals; the U.S.-Japan-Australia-India quadrilateral dialogue (popularly known as the Quad); and the new Australia-U.K.-U.S. (AUKUS) agreement.

Nor is Asia undergirded by any significant economic architecture. Despite substantial trade and expanding value chains among the various Asian states, as well as with the rest of the world, formal economic integration is limited. There are many trade agreements among the nations of the region and among these nations and countries outside of Asia, most prominently the 15-nation Regional Comprehensive Economic Partnership (RCEP) and 11-nation Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), neither of which includes the U.S. However, there is no counterpart to the European Union or even to the European Economic Community or the European Coal and Steel Community, the precursor to European economic integration.

ASEAN (the Association of Southeast Asian Nations) is a looser agglomeration of disparate states,

although they have succeeded in expanding economic linkages among themselves over the past 50 years through a range of economic agreements like the ASEAN Free Trade Area (AFTA). The South Asia Association of Regional Cooperation (SAARC), which includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, has been less effective, both because of the lack of regional economic integration and because of the historical rivalry between India and Pakistan.

### **Important Alliances and Bilateral Relations in Asia**

The keys to a robust U.S. security presence in the Western Pacific are America's alliances with Japan, the Republic of Korea (ROK), the Philippines, Thailand, and Australia. These formal alliances are supplemented by close security relationships with New Zealand and Singapore, an emerging strategic partnership with India, and evolving relationships with Southeast Asian partners like Vietnam, Malaysia, and Indonesia. The U.S. also has a robust unofficial relationship with Taiwan.

The United States also benefits from the interoperability gained from sharing common weapons and systems with many of its allies. Many nations, for example, have equipped their ground forces with M-16/M-4-based infantry weapons and share the same 5.56 mm ammunition. They also field F-15, F-16, and F-35 combat aircraft and employ LINK-16 data links among their naval forces. Australia, Japan, and South Korea are partners in production of the F-35 Joint Strike Fighter, and all three countries have taken delivery of the aircraft. Partners like India and Australia operate American-made P-8 maritime surveillance aircraft and C-17 transport aircraft.

In addition, several "foundational" military agreements with regional partners and allies allow for the sharing of encrypted communications data and equipment, access to each other's military facilities, and the ability to refuel each other's air and naval vessels in theater. In the event of conflict, the region's various air, naval, and even land forces would therefore be able to share information in such key areas as air defense and maritime domain awareness. This advantage is enhanced by the ongoing range of bilateral and multilateral exercises, which acclimate various forces to operating together and familiarize both American and local

commanders with each other's standard operating procedures (SOPs), as well as training, tactics, and (in some cases) war plans.

While it does not constitute a formal alliance, in November 2017, Australia, Japan, India, and the U.S. reconstituted the Quad.<sup>2</sup> Officials from the four countries agreed to meet in the quadrilateral format twice a year to discuss ways to strengthen strategic cooperation and combat common threats. In 2019, the group held its first meeting at the ministerial level and added a counterterrorism tabletop exercise to its agenda.<sup>3</sup> In 2020, officials from the four countries participated in a series of conference calls to discuss responses to the COVID-19 pandemic that also included government representatives from New Zealand, South Korea, and Vietnam.<sup>4</sup> In March 2021, the leaders of the four nations held their first virtual summit, marking a new level of interaction.<sup>5</sup> In September 2021, the four leaders held the first in-person Quad summit, which was followed by a second in-person summit in 2022.<sup>6</sup>

**Japan.** The U.S.–Japan defense relationship is the linchpin of America's network of relations in the Western Pacific. The U.S.–Japan Treaty of Mutual Cooperation and Security, signed in 1960, provides for a deep alliance between two of the world's largest economies and most sophisticated military establishments. Changes in Japanese defense policies are now enabling an even greater level of cooperation on security issues, both between the two allies and with other countries in the region.

Since the end of World War II, Japan's defense policy has been distinguished by Article 9 of the Japanese constitution, which states in part that “the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes.”<sup>7</sup> In effect, this article prohibits the use of force by Japan's governments as an instrument of national policy.

However, Japan's legal interpretation of what is allowed under its peace constitution is not static. It has evolved in response to growing regional threats, Japan's improving military capabilities, and Tokyo's perception of the strength of its alliance with Washington. Japan has gradually adopted missions and deployed weapons that originally were deemed to be unconstitutional.

One such policy was a prohibition against “collective self-defense.” For decades, Japan recognized that nations have a right to employ their armed

forces to help other states defend themselves (in other words, to engage in collective defensive operations) but rejected that policy for itself: Japan would employ its forces only in defense of Japan. This changed in 2015 when Japan passed legislation that enabled its military to exercise collective self-defense in certain cases involving threats to an ally that has come under attack.

Another dramatic shift was Prime Minister Fumio Kishida's decision in December 2022 that Japan would develop long-range missile counterstrike capabilities. Debate about the constitutionality of such capability has raged since 1956 when then-Prime Minister Ichiro Hatoyama assessed that attacking enemy bases could be justified in terms of the right of self-defense. Since then, subsequent Japanese administrations have consistently asserted that Japan has the authority to conduct attacks on enemy targets but chooses not to develop the means to do so.

Citing the escalating Chinese and North Korean missile arsenals, the Kishida administration declared that relying solely on Japanese missile defenses or U.S. strike capabilities to defend against missile threats had become increasingly untenable. Instead, Japan must augment its missile defenses by adding capabilities that would enable it to mount effective counterstrikes against an opponent on its territory to prevent further attacks.

Kishida also broke with long-standing precedent by pledging to raise Japanese defense spending to 2 percent of current gross domestic product (GDP), thereby doubling the self-imposed limit of 1 percent that Tokyo had followed for decades.<sup>8</sup> The Kishida administration emphasized that Japan's rapid and extensive defense buildup required a sustained level of expenditures rather than a temporary increase in spending. Defense spending will be increased to a five-year total of 43 trillion yen (\$323 billion) from 2023–2027, and the annual defense budget will be 10 trillion yen (\$75 billion), making Japan the world's third-biggest military spender after the United States and China.<sup>9</sup>

Russia's invasion of Ukraine caused a significant shift in the Japanese public's perception of their country's threat environment. The Japanese had been aware of the growing Chinese and North Korean threats, but Vladimir Putin's invasion made clear that their perception of a “post-war world” was an illusion and that large-scale military conflicts

between major powers remained a realistic threat. The Russian invasion of Ukraine crystallized Japanese fears of a possible Chinese conflict in Taiwan and was a wakeup call on the need to augment Japan's military.

Before the war in Ukraine, the Japanese populace had feared that loosening any restrictions on Japan's military risked an inexorable return to the country's militaristic past. The war in Ukraine seemingly caused an overnight sea change in Japanese perceptions. Public opinion polls show strong majorities favoring greater defense spending and a counterstrike capability. Prime Minister Shinzo Abe's 2015 implementation of a policy of collective self-defense led to fierce debates in the national legislature and large public protests. By contrast, the bold security steps announced by the Kishida administration in December 2022 elicited strong public support without sparking any protests.

Despite developing a formidable military force, Japan still relies heavily on the United States—and Washington's extended deterrence guarantee of nuclear, conventional, and missile defense forces—for its security. To strengthen military coordination with the United States, Tokyo has pledged to establish a permanent joint headquarters to unify command of the ground, naval, and air forces.

Currently, the Self-Defense Forces are stovepiped with insufficient ability to communicate, plan, or operate across services. Japan's inability to conduct joint operations across its own military services has inhibited its capacity for combined operations with U.S. forces. By designating a single joint commanding general, Japan will now be able to coordinate more effectively with U.S. Indo-Pacific Command (USINDOPACOM) and its combatant commander. Despite this improvement, however, the separate and parallel command structure that Japan and the United States will continue to have is a major shortcoming compared with the integrated command relationship that the U.S. military has with South Korea or NATO allies.

As part of its military relationship with Japan, the United States maintains "approximately 54,000 military personnel" and 8,000 Department of Defense (DOD) civilian and contractor employees in Japan under the rubric of U.S. Forces Japan (USFJ).<sup>10</sup> These forces include, among other things, a forward-deployed carrier battle group centered on the USS *Ronald Reagan*; an amphibious ready

group at Sasebo centered on the LHA-6 *America*, an aviation-optimized amphibious assault ship; and the bulk of the Third Marine Expeditionary Force (III MEF) on Okinawa. U.S. forces exercise regularly with their Japanese counterparts, and this collaboration has expanded in recent years to include joint amphibious exercises as well as air and naval exercises.

The American presence is supported by a substantial American defense infrastructure throughout Japan, including Okinawa. These bases provide key logistical and communications support for U.S. operations throughout the Western Pacific, cutting travel time substantially compared with deployments from Hawaii or the West Coast of the United States. They also provide key listening posts for the monitoring of Russian, Chinese, and North Korean military operations. This capability is supplemented by Japan's growing array of space systems, including new reconnaissance satellites.

During bilateral Special Measures Agreement negotiations, the Trump Administration sought a 400 percent increase in Japanese contributions for remuneration above the cost of stationing U.S. troops in Japan. Late in 2021, Japan's *Asahi Shimbun* reported that Japan had agreed to "ramp up its annual host-nation support for U.S. forces stationed in Japan." Specifically:

Under the agreement, Japan's yearly contribution to host U.S. bases will total 1,055.1 billion yen (\$9.2 billion) for the five-year period from fiscal 2022 through fiscal 2026. This translates into an annual average payment of about 211 billion yen, nearly 10 billion yen more than the 201.7 billion yen Japan pays under the program for the current fiscal year....

Under the new agreement, Japan's funding for facilities within U.S. bases, such as bomb shelters to protect aircraft, will increase, while Japan's outlays for utilities costs will be reduced gradually in five years to 13.3 billion yen from 23.4 billion yen for the current fiscal year. This indicates a shift in the focus of the program from financing running costs for U.S. forces to bolstering operational capabilities.<sup>11</sup>

In January 2022, the U.S. Department of Defense stated that U.S. and Japanese officials had

“reaffirmed that the total amount of Japan’s Facilities Improvement Program (FIP) funding will be 164.1 billion yen to fund prioritized projects, subject to the completion of all necessary procedures for such budget request....”<sup>12</sup>

The United States has long sought to expand Japanese participation in international security affairs. Japan’s political system, grounded in the country’s constitution, legal decisions, and popular attitudes, has generally resisted this effort. However, in recent years, Tokyo has become increasingly alarmed by China’s surging defense expenditures, rapidly expanding and modernizing military capabilities, and escalating aerial and maritime incursions into Japan’s territorial waters and contiguous areas. In response, Japan has reoriented its forces so that they can better counter the Chinese threat to its remote southwest islands. It also has acquired new capabilities, built new facilities, deployed new units and augmented others, improved its amphibious warfare capabilities, increased its air and sea mobility, and enhanced its command-and-control capabilities for joint and integrated operations.<sup>13</sup>

Recently, the growing potential for a Taiwan crisis has led senior Japanese officials to issue increasingly bold public statements of support for Taipei and align Japan’s national interests more directly with the protection of Taiwan’s security. However, there have been no declared policy changes, and Japan has not pledged to intervene directly in a military conflict to defend Taiwan or even to allow U.S. defense of Taiwan from bases in Japan.

Contentious historical issues from Japan’s brutal 1910–1945 occupation of the Korean Peninsula have been serious enough to torpedo efforts to improve defense cooperation between Seoul and Tokyo. South Korean–Japanese relations took a major downturn in 2018 when the South Korean Supreme Court ruled that Japanese companies could be forced to pay reparations for forced labor.<sup>14</sup> In December 2018, an incident between a South Korean naval ship and a Japanese air force plane further exacerbated tensions. Japan responded in July 2019 by imposing restrictions on exports to South Korea of three chemicals that are critical to the production of semiconductors and smartphones.<sup>15</sup> Seoul then threatened to withdraw from the bilateral General Security of Military Information Agreement (GSOMIA), which enables the sharing of classified intelligence and military information on the North

Korean nuclear and missile threat. The Moon Jae-in administration relented and maintained the agreement, but there was public criticism of U.S. pressure.

In March 2023, President Yoon Suk Youl, who had been elected to succeed Moon in March 2022, took a bold and politically risky step to improve bilateral relations with Japan by announcing that Korean rather than Japanese companies would provide compensation to Korean forced labor victims. Yoon’s decision led to the cancellation of Japanese export restrictions, progress toward enhancing economic trade, and discussion on expanding military cooperation toward the common North Korean threat. Yoon’s decision, however, was criticized by a majority of South Koreans, indicating a lack of support that could hinder further security enhancements.

**Republic of Korea.** The United States and the Republic of Korea signed their Mutual Defense Treaty in 1953. That treaty codified the relationship that had grown from the Korean War, when the United States dispatched troops to help South Korea defend itself against invasion by Communist North Korea. Since then, the two states have forged an enduring alliance supplemented by a substantial trade and economic relationship that includes a free trade agreement.<sup>16</sup>

The U.S. is committed to maintaining 28,500 troops on the Korean Peninsula. This presence is centered mainly on the U.S. 2nd Infantry Division, rotating brigade combat teams, and a significant number of combat aircraft.

The U.S.–ROK defense relationship involves one of the more integrated and complex command-and-control structures. A United Nations Command (UNC) established in 1950 was the basis for the American intervention and remained in place after the armistice was signed in 1953. UNC has access to seven bases in Japan to support U.N. forces in Korea.

Although the 1953 armistice ended the Korean War, UNC retained operational control (OPCON) of South Korean forces until 1978, when it was transferred to the newly established Combined Forces Command (CFC). Headed by the American Commander of U.S. Forces Korea, who is also Commander, U.N. Command, CFC reflects an unparalleled degree of U.S.–South Korean military integration. CFC returned peacetime operational control of South Korean forces to Seoul in 1994. If

war became imminent, South Korean forces would become subordinate to the CFC commander, who in turn remains subordinate to both countries' national command authorities.

In 2007, then-President Roh Moo-hyun requested that the United States return wartime OPCON of South Korean forces to Seoul. Under the plan, the CFC commander would be a South Korean general with a U.S. general as deputy commander. The U.S. general would continue to serve as commander of UNC and U.S. Forces Korea (USFK). The CFC commander, regardless of nationality, would always remain under the direction and guidance of U.S. and South Korean political and military national command authorities.

This decision engendered significant opposition within South Korea and raised serious military questions about the transfer's impact on unity of command. Late in 2014, Washington and Seoul agreed to postpone the scheduled wartime OPCON transfer and instead adopted a conditions-based rather than timeline-based policy.

President Moon Jae-in advocated for an expedited OPCON transition during his administration, but critical conditions, including improvement in South Korean forces and a decrease in North Korea's nuclear program, had not been met.<sup>17</sup> Moon's successor, Yoon Suk Youl, criticized his push for a premature return of wartime OPCON before Seoul had fulfilled the agreed-upon conditions.

South Korea has fought alongside the United States in nearly every significant conflict since the Korean War. Seoul sent 300,000 troops to the Vietnam War, and 5,000 of them were killed. At one point, it fielded the third-largest troop contingent in Iraq after the United States and Britain. It also has conducted anti-piracy operations off the coast of Somalia and has participated in peacekeeping operations in Afghanistan, East Timor, and elsewhere. In spite of its support for multinational crisis response, however, South Korea's defense planning is focused on North Korea, especially as Pyongyang has deployed its forces in ways that optimize a southward advance and has carried out several penetrations of ROK territory by ship, submarine, commandos, and drones.

In response to Pyongyang's expanding nuclear strike force, South Korea created a "Three Axis" tiered defense strategy comprised of Kill Chain (preemptive attack); the Korea Air and Missile

Defense (KAMD) system; and the Korea Massive Punishment and Retaliation (KMPR) system. The South Korean military is a sizeable force with advanced weapons and innovative military education and training. South Korean military spending has increased, and Seoul appears to be procuring the right mix of capabilities. U.S.–South Korean interoperability has improved, partly because of continued purchases of U.S. weapons systems.

Over the past several decades, the American presence on the peninsula has slowly declined. In the early 1970s, President Richard Nixon withdrew the 7th Infantry Division, leaving only the 2nd Infantry Division on the peninsula. Those forces have been positioned farther back from North Korea so that few Americans are now deployed on the Demilitarized Zone (DMZ).

Traditionally, U.S. military forces regularly engaged in major exercises with their ROK counterparts, including the Key Resolve and Foal Eagle series, both of which involved the deployment of substantial numbers of U.S. forces to the Korean Peninsula. However, after the 2018 U.S.–North Korean Summit, President Donald Trump announced that he was unilaterally cancelling major bilateral military exercises with South Korea, dismissing them as "very provocative," "ridiculous," "unnecessary," and a "total waste of money."<sup>18</sup> The President made his decision without consulting the DOD, U.S. Forces Korea, or allies South Korea and Japan. During the next four years, the U.S. and South Korea cancelled numerous large-scale exercises and reduced the "size, scope, volume, and timing" of other allied military exercises in South Korea without any change in North Korean military activity<sup>19</sup> or any reciprocal diplomatic gesture in return for the unilateral U.S. concession.

In 2022, South Korean President Yoon and American President Joe Biden agreed to expand the scope and scale of bilateral combined military exercises to repair the degradation of allied deterrence and defense capabilities since 2018. Biden also agreed to resume the rotational deployment of U.S. strategic assets—bombers, aircraft carriers, and dual-capable aircraft—to the Korean Peninsula that Trump had also cancelled in 2018.<sup>20</sup>

In late 2022, Washington and Seoul conducted wide-ranging air, naval, and ground maneuvers on and near the Korean Peninsula. The U.S., South Korea, and Japan also resumed trilateral military



exercises after a five-year hiatus. The three countries engaged in anti-submarine and ballistic missile exercises to enhance security coordination against the common North Korean threat. To capitalize on this positive momentum, Washington and Seoul announced that in 2023, they would conduct at least 20 combined training programs commensurate in size to the large-scale Foal Eagle field training exercises of the past.<sup>21</sup> The Freedom/Warrior Shield exercises in March 2023 were the largest and longest drills in at least five years.

The ROK government provides substantial resources to defray the costs of U.S. Forces Korea. The bilateral, cost-sharing Special Measures Agreement has offset the non-personnel costs of stationing U.S. forces in South Korea since 1991 and is renegotiated every five years.<sup>22</sup> In February 2019, South Korea offered to increase its share of the cost by approximately 8 percent to about \$920 million.<sup>23</sup> President Trump first demanded “cost plus 50 percent”<sup>24</sup> and then demanded a fivefold increase of \$5 billion a year and threatened to reduce or remove U.S. forces from South Korea. In April 2021, the Biden Administration signed an agreement accepting an incremental increase in Seoul’s contribution in line with previous agreements, thereby defusing tensions within the alliance.<sup>25</sup>

South Korea spends 2.6 percent of its gross domestic product (GDP) on defense—more than is spent by any European ally except Poland.<sup>26</sup> Seoul absorbs costs not covered in the cost-sharing agreement, including 91 percent (\$10.7 billion) of the cost of constructing Camp Humphreys, the largest U.S. base on foreign soil.<sup>27</sup>

**The Philippines.** In addition to being America’s longest-standing defense ally in Asia, the Philippines shares a uniquely close and complex relationship with the United States. After more than 300 years of colonial rule, Spain ceded the Philippines to the United States at the conclusion of the Spanish–American War in 1898. Over the next four decades, the United States gradually established democratic institutions and provided for increased autonomy, which culminated in full independence in 1946.

During this period, the United States and Filipinos first fought against each other in the Philippine–American war and in other resistance to colonial government and then alongside each other in World War II. The bond forged between the two peoples has persisted into the 21st century. Recent

polls show that 80 percent of Filipinos view the United States favorably—a greater share than is reported by some other U.S. defense treaty allies in the Indo-Pacific.<sup>28</sup>

The United States and the Philippines signed a Mutual Defense Treaty (MDT) in 1951. For much of the period between 1898 and the end of the Cold War, the Philippines was home to the largest American bases in the Pacific, centered on the U.S. Navy base in Subic Bay and the complex of airfields that developed around Clark Field (later Clark Air Base), where unparalleled base infrastructure provided replenishment and repair facilities and substantially extended deployment periods throughout the East Asian littoral.

These bases, simultaneously controversial reminders of the colonial era and generators of economic activity, provided for substantial lease payments to the Philippines government. In 1991, the United States decided to abandon Clark Air Base after significant damage from a volcanic eruption<sup>29</sup> and offered the Philippines a reduced payment for the continued use of Subic alone.<sup>30</sup> The Philippines rejected the offer, thereby compelling the closure of U.S. Naval Base Subic Bay.<sup>31</sup>

Despite the base closures, U.S.–Philippine military relations remained close, and assistance began to increase again after 9/11 as U.S. forces supported Philippine efforts to counter Islamic terrorist groups, including the Abu Sayyaf Group (ASG), in the South of the archipelago. From 2002–2015, the U.S. rotated 500–600 special operations forces regularly through the Philippines to assist in counterterrorism operations. That operation, Joint Special Operations Task Force–Philippines (JSOTF–P), ended during the first part of 2015.<sup>32</sup>

The U.S. presence in Mindanao continued at a reduced level until the Trump Administration, alarmed by the terrorist threat there, began Operation Pacific Eagle–Philippines (OPE–P). The presence of 200–300 American advisers proved very valuable to the Philippines in its 2017 battle against Islamist insurgents in Marawi.<sup>33</sup>

U.S.–Philippine defense cooperation underwent a period of instability beginning in February 2020 when the sitting Philippine President announced a decision to abrogate the 1998 U.S.–Philippines Visiting Forces Agreement (VFA). An instrument of the MDT, the VFA specifies the procedures governing the deployment of U.S. forces and equipment

to the Philippines and governs the application of domestic Philippine law to U.S. personnel, which is the most substantive part of the VFA and historically the most controversial. During this period, the VFA operated on successive six-month extensions until the Philippines retracted its intention to terminate the agreement in July 2021.<sup>34</sup> Preservation of the VFA underpins extensive joint military activities, which reportedly will include “more than 500 activities together throughout [2023].”<sup>35</sup>

In another sign of strengthening U.S.–Philippine defense ties, in April 2023, the two countries designated additional sites under the Enhanced Defense Cooperation Agreement (EDCA). The EDCA, signed in 2014, authorizes the rotational deployment of U.S. forces and prepositioning of materiel at agreed locations in the Philippines for security cooperation, joint training, and humanitarian assistance and disaster relief.<sup>36</sup> The four new sites brought the total of agreed locations to nine. Two of the newly announced locations are adjacent to the South China Sea, and two are located in areas of the Philippines that are geographically near Taiwan.<sup>37</sup>

The U.S. government has long made it clear that any attack on Philippine ships or aircraft or on the Philippine armed forces—for example, by China—would be covered under the U.S.–Philippine Mutual Defense Treaty and would obligate the United States, consistent with its constitutional procedures, to come to the defense of the Philippines.<sup>38</sup> In February 2023, Secretary of Defense Lloyd Austin reaffirmed this commitment, specifying that such an attack anywhere in the South China Sea would invoke U.S. mutual defense commitments.<sup>39</sup>

**Thailand.** The U.S.–Thai defense alliance is built on the 1954 Manila Pact, which established the now-defunct SEATO, and the 1962 Thanat–Rusk agreement.<sup>40</sup> These were supplemented by the Joint Vision Statements for the Thai–U.S. Defense Alliance of 2012 and 2020.<sup>41</sup> In addition, Thailand gained improved access to American arms sales in 2003 when it was designated a “major, non-NATO ally.”

Thailand’s central location has made it an important part of America’s network of alliances in Asia. During the Vietnam War, U.S. aircraft based in Thailand ranged from fighter-bombers and B-52s to reconnaissance aircraft. In the first Gulf War and again in the Iraq War, some of those same air bases were essential for the rapid deployment of

American forces to the Persian Gulf. Access to these bases remains critical to U.S. global operations.

U.S. and Thai forces exercise together regularly, most notably in the annual Cobra Gold exercises, which were initiated in 1982. This collaboration builds on a partnership that began with the dispatch of Thai forces to the Korean War, during which Thailand’s approximately 12,000 troops suffered more than 1,200 casualties.<sup>42</sup> The Cobra Gold exercise is the world’s longest-running international military exercise<sup>43</sup> and one of its largest. The most recent, in 2023, involved more than 6,000 U.S. personnel and featured, in addition to co-host Thailand,<sup>44</sup> “full participation from the Republic of Indonesia, Republic of Korea, Republic of Singapore, Japan and Malaysia, as well as other limited participants, planners and observers from more than 20 additional nations.”<sup>45</sup> In past years, a small number of Chinese personnel also participated.

While U.S.–Thai security cooperation remains strong, U.S. relations with Thailand overall have faced both persistent strain and acute crises in recent years that are idiosyncratic among U.S. treaty allies. Military coups in 2006 and 2014 limited military-to-military relations for more than a decade. This was due partly to standing U.S. law prohibiting assistance to regimes that result from coups against democratically elected governments and partly to policy choices by the U.S. government.

In 2017, Thailand adopted a junta-drafted constitution that institutionalized elements of military rule. Nonetheless, the United States welcomed Thailand’s first general elections under this constitution in 2019 as “positive signs for a return to a democratic government that reflects the will of the people.”<sup>46</sup> Bilateral military engagement has since rebounded with high-level engagement and arms transfers to the Thai military of major systems like Stryker armored vehicles and Black Hawk helicopters. Under the Biden Administration, this trend may lead to the sale of the F-35.<sup>47</sup>

Thailand is the only Southeast Asian country that was never colonized and has long pursued a hedging strategy that seeks to maintain good relations among competing powers.<sup>48</sup> In the post–Cold War era, this tradition has contributed to Thailand’s geopolitical drift away from the U.S. and toward China—a trend that has been further encouraged by the suppression of democratic institutions in Thailand, resulting tensions in U.S.–Thai bilateral

relations, China's amenability to anti-democratic regimes, and expanding Chinese–Thai economic relations. The U.S. and Thailand have differing threat perceptions concerning China, and this has undermined the U.S.–Thai alliance's clarity of purpose.

Relations between the Thai and Chinese militaries have improved steadily over the years. Thai and Chinese military forces have engaged in joint naval exercises since 2005, joint counterterrorism exercises since 2007, and joint marine exercises since 2010 and conducted their first joint air force exercises in 2015.<sup>49</sup> The Thais conduct more bilateral exercises with the Chinese than are conducted by any other military in Southeast Asia.<sup>50</sup>

Thailand has also purchased Chinese military equipment for many years. Purchases in recent years have included significant buys of battle tanks and armored personnel carriers.<sup>51</sup> According to the Stockholm International Peace Research Institute (SIPRI), from 2006 to 2022, China was a significantly bigger supplier than the U.S.<sup>52</sup> These deals, however, have not been without difficulty. Thailand's acquisition of submarines, for example, has been stalled first by a combination of budget restraints, the priority of COVID-19 response, and public protest<sup>53</sup> and more recently by Germany's refusal to allow export of the engines that the boats require.<sup>54</sup> Submarines could be particularly critical to Sino–Thai relations because their attendant training and maintenance would require a greater Chinese military presence at Thai military facilities.

**Federated States of Micronesia, Republic of the Marshall Islands, and Republic of Palau.** The Federated States of Micronesia (FSM), Republic of the Marshall Islands (RMI), and Republic of Palau<sup>55</sup> enjoy a unique defense partnership with the United States. During World War II, the Pacific Islands were vitally important as the U.S. fought to gain a foothold in the Pacific theater in its campaign against Imperial Japan. After World War II, the Trust Territory of the Pacific Islands was administered by the U.S. and often used for nuclear testing, most notably the 1954 Castle Bravo test, which involved the largest U.S. bomb ever tested, at Bikini Atoll in the Marshall Islands.<sup>56</sup> As the FSM, RMI, and Palau gained independence, they elected to enter a special association with the United States.

About every 20 years, each of the Freely Associated States (FAS) negotiates a renewal of the Compact of Free Association (COFA) with the U.S. that

governs its defense, economic, and immigration affairs. The COFA agreements are strategically important for two primary reasons.

*First*, they grant the U.S. absolute control of all FAS defense matters. The U.S. exclusively operates armed forces and bases throughout the FAS while being responsible for their protection. Some restrictions apply: The U.S. cannot use weapons of mass destruction in Palauan territory and can store them in the FSM or RMI only during war or emergency.<sup>57</sup> Notably, COFA citizens serve in the U.S. armed forces.

*Second*, the U.S. has the right of strategic denial. Strategic denial allows the U.S. to determine unilaterally which militaries are authorized to enter FAS territories.<sup>58</sup> As China's influence and operations throughout the Pacific Islands grow, including recently in the Solomon Islands, the right to strategic denial becomes increasingly important.<sup>59</sup>

The current COFA agreements with the FSM and RMI expire on September 30, 2023, and with Palau on September 30, 2024. In 2003, the U.S. provided \$3.5 billion in funding to the FSM and RMI.<sup>60</sup> The Biden Administration's FY 2024 budget request includes \$7.1 billion over 20 years for the renewal of COFA agreements for all three FAS.<sup>61</sup> Renewal is essential for maintaining U.S. power projection and operational flexibility in the Pacific.<sup>62</sup>

All FAS have a “shiprider” agreement that allows U.S. Coast Guard (USCG) personnel and law enforcement to work with local maritime law enforcement to protect regional resources.<sup>63</sup> The USCG opened the Commander Carlton S. Skinner Building, located at USCG Forces Micronesia/Sector Guam, in 2022.<sup>64</sup> In 2021, former FSM President David Panuelo, USINDOPACOM Commander Admiral John C. Aquilino, and U.S. Ambassador to the FSM Carmen G. Cantor had reached an agreement to build a new military base in the FSM.<sup>65</sup> The RMI hosts the U.S. Army Garrison Kwajalein Atoll, which is the country's second-largest employer, and the Ronald Reagan Ballistic Missile Defense Test Site.<sup>66</sup> In 2012, the Marshall Islands Sea Patrol christened the LOMOR II for maritime inspections and rapid response operations with the support of Japan, Australia, and the United States.<sup>67</sup>

With about 500 Palauans serving in the U.S. armed forces, Palau has a higher volunteer rate per capita than any U.S. state.<sup>68</sup> In 2020, Palau requested that the Pentagon build permanent military

## Strategic Significance of the Compact of Free Association States

Being as close as 1,500 miles away from Taiwan, the Freely Associated States (FAS) can serve as an important staging ground for U.S. armed forces in the Indo-Pacific. Through the COFA agreements, the U.S. also can deny other countries military access to the FAS without explicit authorization.

**Exclusive Economic Zones**

- Freely Associated States
- United States



**NOTE:** Distances are approximate.  
**SOURCE:** Heritage Foundation research.

bases,<sup>69</sup> and a \$118 million foundational installation to support the Tactical Mobile Over-the-Horizon Rader is expected to be operational by 2026<sup>70</sup> with one site along the northern isthmus of Babeldaob and another on Angaur.<sup>71</sup> In 2020, the 17th Field Artillery Brigade maneuvered from Guam to Palau as part of the Defense Pacific 20 exercise with a High Mobility Artillery Rocket System.<sup>72</sup> In 2021, Secretary of Defense Austin hosted Palauan President Surangel Whipps Jr. to discuss defense-related matters.<sup>73</sup> The 1st Air Defense Artillery Battalion, based out of Okinawa, held its first Patriot live-fire exercise in Palau in 2022.<sup>74</sup>

**Australia.** Australia is one of America's most important Indo-Pacific allies. U.S.–Australia security ties date back to World War I when U.S. forces fought under Australian command on the Western Front in Europe. They deepened during World War II when, after Japan commenced hostilities in the Western Pacific, Australian forces committed to the North Africa campaign. As Japanese forces attacked the East Indies and secured Singapore, Australia turned to the United States to bolster its defenses, and American and Australian forces cooperated closely in the Pacific War. Those ties and America's role as the main external supporter of Australian security were codified in the Australia–New Zealand–U.S. (ANZUS) pact of 1951.

Today, the two nations' chief defense and foreign policy officials meet annually (most recently in December 2022) in the Australia–United States Ministerial (AUSMIN) process to address such issues of mutual concern as security developments in the Asia–Pacific region, global security and development, and bilateral security cooperation.<sup>75</sup> Australia also has long granted the United States access to a number of joint facilities, including space surveillance facilities at Pine Gap, which has been characterized as “arguably the most significant American intelligence-gathering facility outside the United States,”<sup>76</sup> and naval communications facilities on the North West Cape of Australia.<sup>77</sup>

In 2011, U.S. access was expanded with the U.S. Force Posture Initiatives (USFPI), which included Marine Rotational Force–Darwin and Enhanced Air Cooperation. The rotation of as many as 2,500 U.S. Marines for a set of six-month exercises near Darwin began in 2012. The current rotation is comprised of 2,500 Marines that participate in multiple live fire and joint exercises.<sup>78</sup> In the past,

these forces have deployed with assets that include a MV-22 Osprey squadron, UH-1Y Venom utility and AH-1Z Viper attack helicopters, and RQ-21A Blackjack drones.

The USFPI's Enhanced Air Cooperation component began in 2017, building on preexisting schedules of activity. New activities include “fifth generation integration, aircraft maintenance integration, aeromedical evacuation (AME) integration, refueling certification, and combined technical skills and logistics training.”<sup>79</sup> Enhanced Air Cooperation has been accompanied by the buildout of related infrastructure at Australian bases, including a massive fuel storage facility in Darwin.<sup>80</sup> Other improvements are underway at training areas and ranges in Australia's Northern Territories.<sup>81</sup>

In 2021, the U.S., Australia, and the U.K., which already enjoyed close security cooperation, inaugurated a new Australia–United Kingdom–United States partnership (AUKUS) initiative. A key component of this initiative is support for Australia's acquisition of “a conventionally armed, nuclear powered submarine capability at the earliest possible date, while upholding the highest non-proliferation standards.”<sup>82</sup> Among other things, the partnership also focuses on improving cooperation in undersea robotic autonomous systems, quantum technologies, artificial intelligence, and hypersonic capabilities.<sup>83</sup>

On March 13, 2023, the AUKUS partners announced an arrangement under which Australia will acquire nuclear submarines, to be known as SSN-AUKUS, featuring U.K. submarine design and advanced U.S. technology. Both Australia and the U.K. will deploy SSN-AUKUS and intend to begin domestic production before 2030. The U.K. plans to deliver its first SSN-AUKUS in the late 2030s, and Australia plans to deliver its first submarine in the early 2040s. The U.S. intends to sell three and as many as five *Virginia*-class submarines to Australia in the early 2030s. The agreement also includes increases in funding, training, port and personnel visits, rotations, and infrastructure projects.<sup>84</sup> Although maintaining political support for the decades-long commitments may prove challenging, the envisioned pathway should unleash a new era of AUKUS partnership and security in the Indo-Pacific.

This new cutting-edge cooperation under the USFPI and AUKUS comes on top of long-standing joint U.S.–Australia training, the most prominent

example of which is Talisman Saber, a series of bi-annual exercises that involve U.S. Army, Navy, Air Force, and Marines as well as almost two-dozen ships, multiple civilian agencies, and participants embedded from other partner countries.<sup>85</sup> COVID forced the 2021 iteration to downsize, but the 2019 version included more than 34,000 personnel from the U.S. and Australia. The 2023 exercise is scheduled for July 21 to August 4, 2023.<sup>86</sup>

In April 2023, the government of Prime Minister Anthony Albanese released a *Defence Strategic Review* billed as “the most ambitious review of Defence’s posture and structure since the Second World War.”<sup>87</sup> The review assesses that the U.S. is no longer the “unipolar leader of the Indo-Pacific” and recommends that Australia adopt a strategy of denial with a focused force structure that prioritizes the “most significant military risks.”<sup>88</sup> China’s strategic intentions, demonstrated by its military buildups and provocative actions in the South China Sea and Pacific Islands, are assessed as likely to have a negative impact on Australian interests.<sup>89</sup> The Albanese government either agreed or agreed in-principle to adopt or implement all of the review’s 62 recommendations.<sup>90</sup>

**Singapore.** Singapore is America’s closest non-ally partner in the Western Pacific. The agreements that support this security relationship are the 2015 U.S.–Singapore Enhanced Defense Cooperation Agreement (DCA),<sup>91</sup> which is an update of a similar 2005 agreement, and the 1990 Memorandum of Understanding Regarding United States Use of Facilities in Singapore, which was renewed in 2019 for another 15 years.<sup>92</sup>

Pursuant to these agreements and other understandings, Singapore hosts U.S. naval ships and aircraft as well as Logistics Group Western Pacific, principal logistics command unit for the U.S. Seventh Fleet.<sup>93</sup> U.S. Navy P-8 Poseidon maritime patrol aircraft began rotational deployments to Singapore in 2015,<sup>94</sup> and Littoral Combat Ships have deployed to Singapore since 2016.<sup>95</sup> The U.S. Air Force began rotational deployments of RQ-4 Global Hawk unmanned aircraft to Singapore in 2023.<sup>96</sup> Notably, the Changi Naval Base is capable of hosting U.S. aircraft carriers, which visit regularly with the USS *Nimitz* conducting the most recent port call in January 2023.<sup>97</sup>

According to the U.S. Department of State, “[t]he United States has \$8.38 billion in active

government-to-government sales cases with Singapore under the Foreign Military Sales (FMS) system” and “[f]rom 2019 through 2021...authorized the permanent export of over \$26.3 billion in defense articles to Singapore via Direct Commercial Sales (DCS).”<sup>98</sup> In addition, “more than 1,000 Singaporean military personnel participate in training, exercises, and Professional Military Education in the United States,” and “Singapore has operated advanced fighter jet detachments in the continental United States for 27 years.”<sup>99</sup>

In January 2020, it was announced that Singapore had been “formally approved to become the next customer of the F-35 Joint Strike Fighter, paving the way for a future sale.”<sup>100</sup> Like others of its assets, the four F-35s were to be housed at training facilities in the U.S.<sup>101</sup> and perhaps on Guam under an agreement reached in 2019.<sup>102</sup> In February 2023, it was reported that “Singapore will exercise a contractual option to acquire eight more F-35B fighter jets, bringing its fleet to 12 aircraft that manufacturer Lockheed Martin will deliver by the end of the decade.”<sup>103</sup>

**New Zealand.** For much of the Cold War, U.S. defense ties with New Zealand were similar to those between America and Australia. In 1986, New Zealand was suspended from the 1951 ANZUS treaty for pursuing a “nuclear free zone” and barring nuclear-powered vessels from entering its 12-nautical-mile territorial sea. In 2012 the ban on visits by U.S. nuclear-powered naval vessels was lifted.<sup>104</sup>

Defense relations improved in the early 21st century as New Zealand committed forces to Afghanistan and dispatched an engineering detachment to Iraq. The 2010 Wellington Declaration and 2012 Washington Declaration, while not restoring full security ties, allowed the two nations to resume high-level defense dialogues.<sup>105</sup> As part of this warming of relations, New Zealand rejoined the multinational U.S.-led RIMPAC (Rim of the Pacific) naval exercise in 2012 and has participated in each iteration since then.

In 2013, U.S. Secretary of Defense Chuck Hagel and New Zealand Defense Minister Jonathan Coleman announced the resumption of military-to-military cooperation,<sup>106</sup> and in July 2016, the U.S. accepted an invitation from New Zealand to make a single port call, reportedly with no change in U.S. policy to confirm or deny the presence of nuclear weapons on the ship.<sup>107</sup> At the time of the visit in

November 2016, both sides claimed to have satisfied their respective legal requirements.<sup>108</sup> Prime Minister John Key expressed confidence that the vessel was not nuclear-powered and did not possess nuclear armaments, and the U.S. neither confirmed nor denied this.

The November 2016 visit occurred in a unique context, including an international naval review and a relief response to the Kaikoura earthquake. Since then, there have been several other ship visits by the U.S. Coast Guard. In 2017, New Zealand lent one of its naval frigates to the U.S. Seventh Fleet following a deadly collision between the destroyer USS *Fitzgerald* and a Philippine container ship that killed seven American sailors.<sup>109</sup> In November 2021, the guided-missile destroyer USS *Howard* made a port call in New Zealand.<sup>110</sup>

New Zealand is a member of the elite Five Eyes intelligence alliance with the U.S., Canada, Australia, and the U.K.<sup>111</sup> After a period of record attrition in the New Zealand Defence Force that led to the idling of three naval vessels and early retirement of the country's P-3 Orion fleet, New Zealand is reportedly considering "the possibility of...becoming a non-nuclear partner of AUKUS" and increasing overall resources allocated to defense.<sup>112</sup>

**Taiwan.** When the United States shifted its recognition of the government of China from the Republic of China (Taiwan) to the People's Republic of China (PRC), it also declared certain commitments concerning the security of Taiwan. These commitments are embodied in the Taiwan Relations Act (TRA) and the subsequent "Six Assurances."<sup>113</sup>

The TRA is an American law, not a treaty. Under the TRA, the United States maintains programs, transactions, and other relations with Taiwan through the American Institute in Taiwan (AIT). Except for the Sino-U.S. Mutual Defense Treaty, which had governed U.S. security relations with Taiwan and was terminated by President Jimmy Carter following the shift in recognition to the PRC, all other treaties and international agreements made between the Republic of China and the United States remain in force.

Under the TRA, it is U.S. policy "to provide Taiwan with arms of a defensive character."<sup>114</sup> The TRA also states that the U.S. "will make available to Taiwan such defense articles and services in such quantity as may be necessary to enable Taiwan to maintain a sufficient self-defense capability."<sup>115</sup> The

U.S. has implemented these provisions of the act through sales of weapons to Taiwan.

The TRA states that it is also U.S. policy "to consider any effort to determine the future of Taiwan by other than peaceful means, including by boycotts or embargoes, a threat to the peace and security of the Western Pacific area and of grave concern to the United States"<sup>116</sup> and "to maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan."<sup>117</sup> To this end:

The President is directed to inform the Congress promptly of any threat to the security or the social or economic system of the people on Taiwan and any danger to the interests of the United States arising therefrom. The President and the Congress shall determine, in accordance with constitutional processes, appropriate action by the United States in response to any such danger.<sup>118</sup>

Supplementing the TRA are the "Six Assurances" issued by President Ronald Reagan in a secret July 1982 memo, later publicly released and the subject of hearings held by the Senate Committee on Foreign Relations and the House Committee on Foreign Affairs in August 1982.<sup>119</sup> These assurances were intended to moderate the third Sino-American communiqué, itself generally seen as one of the "Three Communiqués" that form the foundation of U.S.-PRC relations. These assurances of July 14, 1982, were that:

In negotiating the third Joint Communiqué with the PRC, the United States:

1. *has not agreed to set a date for ending arms sales to Taiwan;*
2. *has not agreed to hold prior consultations with the PRC on arms sales to Taiwan;*
3. *will not play any mediation role between Taipei and Beijing;*
4. *has not agreed to revise the Taiwan Relations Act;*
5. *has not altered its position regarding sovereignty over Taiwan;*
6. *will not exert pressure on Taiwan to negotiate with the PRC.*<sup>120</sup>

Although the United States sells Taiwan a variety of military equipment, provides limited training to Taiwanese military personnel, and sends observers to Taiwan's major annual exercises, it does not engage in joint exercises with Taiwan's armed forces. Some Taiwan military officers attend professional military education institutions in the United States, and there are regular high-level meetings between senior U.S. and Taiwan defense officials, both uniformed and civilian.

The United States does not maintain any bases in Taiwan. However, in late 2021, after reports of an uptick in the number of U.S. military advisers in Taiwan, Taiwan's President Tsai Ing-wen acknowledged their presence going back at least to 2008.<sup>121</sup> The numbers involved are in the dozens but are likely to increase to between 100 and 200 by the end of 2023 according to media reports.<sup>122</sup> Most of these personnel will continue to be focused on training Taiwanese soldiers to use U.S.-sourced military equipment and to carry out military maneuvers with a view to defending Taiwan against a hypothetical attack by China.

**Vietnam, Malaysia, and Indonesia.** On a region-wide basis, the U.S. has two major ongoing defense-related initiatives to expand its relationships and diversify the geographical spread of its forces:

- The Maritime Security Initiative, which is intended to improve the security capacity of U.S. partners, and
- The Pacific Deterrence Initiative (PDI), which bolsters America's military presence and makes it more accountable.

Among the most important of the bilateral partnerships in this effort, beyond those listed previously, are Vietnam, Malaysia, and Indonesia. None of these relationships is as extensive and formal as America's relationship with Singapore, India, and U.S. treaty allies, but all are of growing significance.

After decades without diplomatic relations following the Vietnam War, improvements in bilateral relations in recent years have led to Vietnam's emergence as a nascent U.S. security partner. Relations have been bolstered by U.S. efforts to assist Vietnam in mitigating continued dangers from Vietnam War-era unexploded ordnance (UXO) as well as bilateral efforts to address other war legacy

issues. Since 1993, for example, "the U.S. government [has] contributed more than \$206 million for UXO efforts," and "UXO assistance continues to be a foundational element of U.S.-Vietnam relations."<sup>123</sup>

Since the normalization of diplomatic relations between the two countries in 1995, the U.S. and Vietnam also have gradually normalized their defense relationship, codified in 2011 with a Memorandum of Understanding (MOU) Advancing Bilateral Defense Cooperation.<sup>124</sup> In 2015, the MOU was updated by the Joint Vision Statement on Defense Cooperation, which includes references to such issues as "defense technology exchange"<sup>125</sup> and was implemented under a three-year 2018–2020 Plan of Action for United States–Viet Nam Defense Cooperation that was agreed upon in 2017.<sup>126</sup> According to USINDOPACOM's 2022 command posture statement, the U.S. and Vietnam "are expected to sign a three-year Defense Cooperation Plan of Action for 2022–2024 and an updated Defense MOU Annex codifying new cooperation areas, including defense trade, pilot training, cyber, and personnel accounting (POW/MIA)."<sup>127</sup>

Significant limits on the U.S.–Vietnam security relationship persist, including a Vietnamese defense establishment that is very cautious in its selection of defense partners; ties between the Communist Party of Vietnam (CPV) and Chinese Communist Party (CCP); and a Vietnamese foreign policy that seeks to balance relationships with all major powers. The most significant development with respect to security ties over the past several years has been relaxation of the ban on sales of arms to Vietnam. The U.S. lifted the embargo on maritime security-related equipment in the fall of 2014 and then ended the embargo on arms sales completely in 2016. The embargo had long served as a psychological obstacle to Vietnamese cooperation on security issues, but lifting it has not changed the nature of the articles that are likely to be sold.

Transfers to date have been to the Vietnamese Coast Guard. These include provision under the Excess Defense Articles (EDA) program of three decommissioned *Hamilton*-class cutters and 24 Metal Shark patrol boats as well as infrastructure support.<sup>128</sup> Vietnam is scheduled to take delivery of six Insitu<sup>129</sup> ScanEagle unmanned aerial system (UAS) drones for its Coast Guard.<sup>130</sup> The U.S. is also providing T-6 turboprop trainer aircraft.<sup>131</sup> Agreement has yet to be reached with respect to sales of



bigger-ticket items like refurbished P-3 maritime patrol aircraft, although they have been discussed.

The U.S.–Vietnam Cooperative Humanitarian and Medical Storage Initiative (CHAMSI) is designed to enhance cooperation on humanitarian assistance and disaster relief by, among other things, prepositioning related American equipment in Da Nang, Vietnam.<sup>132</sup> This is a sensitive issue for Vietnam and is not often referenced publicly, but it was emphasized during Vietnamese Prime Minister Nguyen Xuan Phuc’s visit to Washington in 2017 and again during Secretary of Defense James Mattis’s visit to Vietnam in 2018. In the same year, Vietnam participated in RIMPAC for the first time. It did not participate in the exercise in 2020, when it was scaled down because of COVID-19,<sup>133</sup> or in 2022.

There have been two high-profile port calls to Vietnam since 2018. Early that year, the USS *Carl Vinson* visited Da Nang with its escort ships in the first port call by a U.S. aircraft carrier since the Vietnam War, and another carrier, USS *Theodore Roosevelt*, visited Da Nang in March 2020. These are significant signals from Vietnam about its receptivity to partnership with the U.S. military—messages underscored very subtly in Vietnam’s 2019 *Viet Nam National Defence* white paper.<sup>134</sup> In July 2022, a potential third carrier visit, this time by the USS *Ronald Reagan*, was cancelled.<sup>135</sup> The U.S., like others among Vietnam’s security partners, remains officially restricted to one port call a year with an additional one to two calls on Vietnamese bases being negotiable.

The U.S. and Malaysia, despite occasional political differences, “have maintained steady defense cooperation since the 1990s.” Examples of this cooperation have included Malaysian assistance in the reconstruction of Afghanistan and involvement in antipiracy operations “near the Malacca Strait and, as part of the international anti-piracy coalition, off the Horn of Africa” as well as “jungle warfare training at a Malaysian facility, bilateral exercises like Kris Strike, and multilateral exercises like Cobra Gold, which is held in Thailand and involves thousands of personnel from several Asian countries plus the United States.”<sup>136</sup> The U.S. has occasionally flown P-3 and/or P-8 patrol aircraft out of Malaysian bases in Borneo.

The U.S. relationship with Malaysia was strengthened under President Barack Obama and continued on a positive trajectory under the

Trump Administration. In addition to cooperation on counterterrorism, the U.S. is focused on helping Malaysia to ensure maritime domain awareness. In 2020, then–Deputy Assistant Secretary of Defense for South and Southeast Asia Reed B. Werner summarized recent U.S. assistance in this area:

[M]aritime domain awareness is important for Malaysia, given where it sits geographically. Since 2017, we have provided nearly US\$200 million (RM853 million) in grant assistance to the Malaysian Armed Forces to enhance maritime domain awareness, and that includes ScanEagle unmanned aerial vehicles (UAV), maritime surveillance upgrades, and long-range air defence radar.<sup>137</sup>

Malaysia has also been upgrading its fleet of fighter aircraft. In February 2023, Malaysia awarded a \$920 million contract to Korea Aerospace Industries for 18 FA-50 light attack aircraft, the first of which is to be delivered in 2026.<sup>138</sup>

The U.S.–Indonesia defense relationship was revived in 2005 following a period of estrangement caused by American concerns about human rights. It now includes regular joint exercises, port calls, and sales of weaponry. Because of their impact on the operating environment in and around Indonesia, as well as the setting of priorities in the U.S.–Indonesia relationship, the U.S. has also worked closely with Indonesia’s defense establishment to reform Indonesia’s strategic defense planning processes.

U.S.–Indonesia military cooperation is governed by the 2010 Framework Arrangement on Cooperative Activities in the Field of Defense and the 2015 Joint Statement on Comprehensive Defense Cooperation<sup>139</sup> as well as the 2010 Comprehensive Partnership. These agreements have encompassed “more than 200 bilateral military engagements a year” and cooperation in six areas: “maritime security and domain awareness; defense procurement and joint research and development; peacekeeping operations and training; professionalization; HA/DR [High Availability/Disaster Recovery]; and countering transnational threats such as terrorism and piracy.”<sup>140</sup>

In 2021, the agreements framed new progress in the relationship that included breaking ground on a new coast guard training base,<sup>141</sup> inauguration of a new Strategic Dialogue,<sup>142</sup> and the largest-ever

U.S.–Indonesia army exercise.<sup>143</sup> In 2022, this exercise, Garuda Shield, involved “more than 4,000 combined forces from 14 countries.”<sup>144</sup> As of March 2021, the U.S. “ha[d] \$1.88 billion in active government-to-government sales cases with Indonesia under the Foreign Military Sales (FMS) system.”<sup>145</sup> In February 2022, the U.S. agreed to sell Indonesia “up to 36” F-15s and related equipment and munitions worth \$14 billion.<sup>146</sup> During a visit by Defense Secretary Lloyd Austin to Jakarta in November 2022, Indonesian Defense Minister Prabowo Subianto said that Indonesia “is on the verge of making a decision about buying” the jets<sup>147</sup> and that the deal was in “advanced stages.”<sup>148</sup>

The U.S. and Indonesia also have signed two of the four foundational information-sharing agreements that the U.S. maintains with its closest partners: the General Security of Military Information Agreement (GSOMIA) and Communications Interoperability and Security Memorandum of Agreement (CISMOA).

**Afghanistan.** On October 7, 2001, U.S. forces invaded Afghanistan in response to the September 11, 2001, terrorist attacks on the United States. This marked the beginning of Operation Enduring Freedom to combat al-Qaeda and its Taliban supporters. The U.S., in alliance with the U.K. and the anti-Taliban Afghan Northern Alliance forces, ousted the Taliban from power in December 2001. Most Taliban and al-Qaeda leaders fled across the border into Pakistan’s Federally Administered Tribal Areas where they regrouped and initiated an insurgency in Afghanistan in 2003 that would endure for 20 years.

In 2018, U.S. Special Envoy Zalmay Khalilzad initiated talks with the Taliban in Doha, Qatar, in an attempt to find a political solution to the conflict and encourage the group to negotiate with the Afghan government.<sup>149</sup> In February 2020, Ambassador Khalilzad and Taliban co-founder and chief negotiator Abdul Ghani Baradar signed a tentative peace agreement in which the Taliban agreed that it would not allow al-Qaeda or any other transnational terrorist group to use Afghan soil.<sup>150</sup> It also agreed not to attack U.S. forces as long as they provided and remained committed to a withdrawal timeline, eventually set at May 2021.

In April 2021, President Biden announced that the U.S. would be withdrawing its remaining 2,500 soldiers from Afghanistan by September 11, 2021,

remarking that America’s “reasons for remaining in Afghanistan are becoming increasingly unclear.”<sup>151</sup> As the final contingent of U.S. forces was leaving Afghanistan in August 2021, the Taliban launched a rapid offensive across the country, seizing provincial capitals and eventually the national capital, Kabul, in a matter of weeks. During the Taliban offensive, President Ghani fled the country for the United Arab Emirates (UAE), and the Afghan security forces largely abandoned their posts.<sup>152</sup>

Having vacated the Air Force base at Bagram in July, the U.S. and other countries were left trying to evacuate their citizens and allies from the Kabul International Airport as the Taliban assumed control of the capital. Amid the chaos, a suicide bombing attack on the airport perimeter on August 26 killed 13 U.S. military personnel and nearly 200 Afghans. IS-K, the local branch of ISIS, claimed responsibility for the attack, and the Biden Administration subsequently launched drone strikes on two IS-K targets.<sup>153</sup>

The last U.S. forces were withdrawn on August 30, 2021, and the Taliban soon formed a new government comprised almost entirely of hard-line elements of the Taliban and Haqqani Network, including several individuals on the U.S. government’s Specially Designated Global Terrorists list.<sup>154</sup> Sirajuddin Haqqani, arguably the most powerful figure in the new Afghan government, carries a \$10 million U.S. bounty for his organization’s involvement in countless terrorist attacks.<sup>155</sup>

Since seizing power, the Taliban government has hunted down and executed hundreds of former government officials and members of the Afghan security forces. It also has cracked down on Afghanistan’s free press, banned education for girls beyond sixth grade while the daughters of several Taliban leaders attend school in Pakistan and the UAE, and curtailed the rights of women and minorities. Under Taliban rule, the Afghan economy has collapsed. The World Bank estimates that GDP contracted by 30 percent–35 percent between 2021 and 2022,<sup>156</sup> and the U.N. World Food Programme has said that Afghanistan is at risk of famine without hundreds of millions of dollars in food aid.<sup>157</sup>

Like most of the world’s other governments, the U.S. government has refused to offer the new Taliban government diplomatic recognition. In October 2021, Under Secretary of Defense for Policy Colin Kahl admitted that both al-Qaeda and ISIS-K (the

local branch of the Islamic State) were operating in Afghanistan with the intent to conduct terrorist attacks abroad, including against the U.S. Specifically, Kahl estimated that “[w]e could see ISIS-K generate that capability in somewhere between 6 or 12 months” and that “Al Qaeda would take a year or two to reconstitute that capability.”<sup>158</sup>

In August 2022, a U.S. drone strike killed al-Qaeda leader Ayman al Zawahiri, who was discovered residing in a safehouse in Kabul.<sup>159</sup> The U.S. government claimed the operation was the result of “careful, patient and persistent work by counterterrorism professionals” and claimed the Taliban had violated its agreement with the U.S., struck at Doha, in which it pledged not to host al-Qaeda and other international terrorist groups.<sup>160</sup>

The Taliban–Haqqani government has faced an ongoing wave of attacks, violence, and assassinations from ISIS-K. Since its emergence around 2015, the Islamist extremist group has been competing with the Taliban–Haqqani Network alliance for territory and recruits. Meanwhile, the Pakistani Taliban, allies of the Afghan Taliban and Haqqani Network, have escalated attacks against neighboring Pakistan since the withdrawal of U.S. forces from Afghanistan.

**Pakistan.** After decades of tactical collaboration during the Cold War, Pakistan and the U.S. developed an often troubled relationship after the U.S. invasion of Afghanistan. During the early stages of the war, the U.S. and NATO relied heavily on logistical supply lines running through Pakistan to resupply anti-Taliban coalition forces. Supplies and fuel were carried on transportation routes from the port at Karachi to Afghan–Pakistani border crossing points at Torkham in the Khyber Pass and Chaman in Baluchistan province. For roughly the first decade of the war, approximately 80 percent of U.S. and NATO supplies traveled through Pakistani territory. Those amounts progressively decreased as the U.S. and allied troop presence decreased.

By the late 2000s, tensions emerged in the relationship over accusations by U.S. analysts and officials that Pakistan was providing a safe haven to the Taliban and its allies as they intensified their insurgency in Afghanistan. The Taliban’s leadership council (shura) was located in Quetta, the capital of Pakistan’s Baluchistan province. U.S.–Pakistan relations, already tense, suffered an acrimonious rupture in 2011 when U.S. special forces conducted

a raid on Osama bin Laden’s hideout in Abbottabad less than a mile from a prominent Pakistani military academy.<sup>161</sup> Relations deteriorated further in 2017 when President Trump suspended billions of dollars of U.S. military assistance to Pakistan and declared that “[w]e can no longer be silent about Pakistan’s safe havens for terrorist organizations, the Taliban, and other groups that pose a threat to the region and beyond.”<sup>162</sup>

Since 2015, U.S. Administrations have refused to certify that Pakistan has met requirements to crack down on the Haqqani Network, an Afghan terrorist group with known links to Pakistan’s Inter-Services Intelligence Agency.<sup>163</sup> In addition to suspending aid, the Trump Administration supported both Pakistan’s addition to the Financial Action Task Force (FATF) list of Jurisdictions Under Increased Monitoring (“grey list”) for failing to fulfill its obligations to prevent the financing of terrorism and its designation as a “Countr[y] of Particular Concern under the International Religious Freedom Act of 1998 for having engaged in or tolerated ‘systematic, ongoing, [and] egregious violations of religious freedom.’”<sup>164</sup> In October 2022, Pakistan was removed from the grey list because of its reportedly improved efforts against “money laundering, terrorist financing, and...armed groups and individuals.”<sup>165</sup>

Despite harboring and supporting a variety of known terrorist groups that operate in Afghanistan and Kashmir, Pakistan has been subject to terrorism from anti-state extremist groups, including the Pakistani Taliban (TTP). In the late 2000s and early 2010s, the TTP engaged in a bloody campaign of terrorism against the Pakistani state; from 2008–2013, approximately 2,000 civilians were killed in terrorist attacks each year. The Pakistan military launched a series of operations against these groups in 2014 and succeeded in progressively reducing terrorist violence in the years that followed.<sup>166</sup>

However, after the Afghan Taliban assumed power in Kabul, the number of attacks on Pakistan civilian and military targets spiked dramatically.<sup>167</sup> Islamabad has repeatedly accused the Taliban government in Kabul of harboring the TPP and ISIS-K—the two groups that took credit for most of these attacks—or failing to rein in their activities. Tensions reached a tipping point in April 2022 when the Taliban accused Pakistan of launching cross-border raids into Afghanistan to target these groups and causing dozens of civilian casualties in

the process.<sup>168</sup> The Pakistani government's peace negotiations with the TTP have produced a cycle of temporary cease-fires punctuated by cycles of violence and terrorism against civilians and Pakistani security personnel. Pakistan claims the Taliban-led government in Kabul is either collaborating with the Pakistani Taliban or tacitly permitting them to use Afghan soil to launch attacks inside Pakistan.

Pakistan–U.S. relations improved modestly from 2018–2021 as Pakistan involved itself in bringing the Afghan Taliban to the negotiating table in Doha. However, relations have remained generally strained since the U.S. withdrawal from Afghanistan. President Biden reportedly has refused to engage in direct communications with Prime Minister Imran Khan, and Pakistan declined an invitation to attend President Biden's December 2021 Summit for Democracy. Deputy Secretary of State Wendy Sherman visited Pakistan in October 2021 to discuss “the importance of holding the Taliban accountable to the commitments they have made.” Days earlier, she noted: “We don't see ourselves building a broad relationship with Pakistan. And we have no interest in returning to the days of hyphenated India–Pakistan.”<sup>169</sup>

Pakistan also has been beset by simultaneous economic, political, and security crises in recent years. Prime Minister Khan was ousted from power in April 2022 after losing a no-confidence vote in parliament and was later barred from running for office for five years based on charges that he insists are politically motivated. Khan's supporters have repeatedly taken to the streets, and Khan has been calling for new parliamentary elections ever since the 2022 by-elections in which his PTI political party performed well. In May 2023, Khan was arrested on corruption charges, and widespread protests ensued.<sup>170</sup> Unusually, protesters targeted military facilities and personnel, even raiding the homes of senior military commanders.<sup>171</sup> However, by month's end, Khan was released, the protests abated, and several members of his political party defected.<sup>172</sup> New national elections are due to be held in October 2023.<sup>173</sup>

Pakistan's economy is teetering on the verge of collapse with skyrocketing inflation and dwindling foreign exchange reserves. These problems were made even worse by devastating floods in 2022 that killed thousands and affected millions. The Pakistani government is seeking billions of dollars in aid simply to meet its growing debt obligations

but has found multilateral lenders like the IMF and traditional patrons like Saudi Arabia and China increasingly unwilling to provide relief on favorable terms. Pakistan has obligations to repay nearly \$80 billion in international loans in the next three to four years but has just \$3 billion in foreign exchange reserves.<sup>174</sup>

**Pakistan's Nuclear Weapons Stockpile.** In September 2021, the *Bulletin of the Atomic Scientists* estimated that Pakistan “now has a nuclear weapons stockpile of approximately 165 warheads.” The report added that “[w]ith several new delivery systems in development, four plutonium production reactors, and an expanding uranium enrichment infrastructure, however, Pakistan's stockpile... could grow to around 200 warheads by 2025, if the current trend continues.”<sup>175</sup>

The possibility that terrorists could gain effective access to Pakistani nuclear weapons is contingent on a complex chain of circumstances. Concern about the safety and security of Pakistan's nuclear weapons increases when India–Pakistan tensions increase. If Pakistan were to move its nuclear assets or (worse) take steps to mate weapons with delivery systems, the likelihood of theft or infiltration by terrorists could increase.

Increased reliance on tactical nuclear weapons (TNWs) is of particular concern because launch authorities for TNWs are typically delegated to lower-tier field commanders far from the central authority in Islamabad. Another concern is the possibility that miscalculations could lead to regional nuclear war if India's leaders were to lose confidence that nuclear weapons in Pakistan are under government control or, conversely, were to assume that they were under Pakistani government control after they ceased to be.

There are additional concerns that Islamist extremist groups with links to the Pakistan security establishment could exploit those links to gain access to nuclear weapons technology, facilities, and/or materials. The realization that Osama bin Laden stayed for six years within a mile of Pakistan's premier defense academy has fueled concern that al-Qaeda can operate relatively freely in parts of Pakistan. Pakistan's weapons-grade materials were ranked the 19th least secure by the Nuclear Threat Initiative (NTI) in 2018 with only Iran's and North Korea's ranking less secure at 21st and 22nd, respectively.<sup>176</sup> In its 2020 report, the NTI assessed

that the “[m]ost improved among countries with materials in 2020 is Pakistan, which was credited with adopting new on-site physical protection and cybersecurity regulations, improving insider threat prevention measures, and more.”<sup>177</sup>

There is the additional (though less likely) scenario of extremists gaining access through a collapse of the state. While Pakistan remains unstable because of its weak economy, regular terrorist attacks, sectarian violence, civil–military tensions, and the growing influence of religious extremist groups, a total collapse of the Pakistani state is highly unlikely. The country’s most powerful institution, the 550,000-strong army that has ruled Pakistan for almost half of its existence, would almost certainly intervene and assume control once again if the political situation began to unravel. The potential breakup of the Pakistani state would have to be preceded by the disintegration of the army, which currently is not plausible.

**Pakistan–India Conflict.** India and Pakistan have fought four wars since partition in 1947, including conflicts in 1947, 1965, 1971, and 1999. Deadly border skirmishes across the Line of Control (LoC) in Kashmir, a disputed territory claimed in full by both India and Pakistan, are common occurrences.

With terrorist groups operating relatively freely in Pakistan and maintaining links to its military and intelligence services, there is a moderate risk that the two countries might eventually engage in all-out conflict. Pakistan’s recent focus on incorporating tactical nuclear weapons into its warfighting doctrine has also raised concern that conflict now involves a higher risk of nuclear exchange. Early in 2019, Pakistan conducted several tests of its nuclear-capable, short-range NASR ballistic missiles.<sup>178</sup>

After his party swept elections and he was named prime minister in 2014, Indian Prime Minister Narendra Modi invited Pakistani Prime Minister Nawaz Sharif to his swearing-in ceremony, but in August 2014, the two sides engaged in intense firing and shelling along their international border and the Line of Control that divides Kashmir. A similar escalation in border tensions occurred again in October 2014 when a series of firing incidents claimed more than a dozen casualties with several dozen more injured.<sup>179</sup>

On December 25, 2015, Modi made an impromptu visit to Lahore—the first visit to Pakistan by an Indian leader in 12 years—to meet with Sharif. The

visit created enormous goodwill between the two countries and raised hope that official dialogue would soon resume. Again, however, violence marred the new opening. One week after the meeting, militants attacked an Indian airbase at Pathankot, killing seven Indian security personnel.<sup>180</sup>

Ever since then, a comprehensive India–Pakistan dialogue has remained frozen, although the two governments still communicate regularly with one another. New Delhi has insisted that Pakistan take concrete verifiable steps to crack down on terrorist groups before a comprehensive dialogue covering all outstanding issues—including the Kashmir dispute—can resume. Unfortunately, the past few years have been marred by additional terrorist attacks and cross-border shelling. The Pakistan-based Jaish-e-Mohammed (JeM) terrorist group, for example, was responsible for a January 2016 attack on the Indian airbase at Pathankot, a February 2018 attack on an Indian army camp in Kashmir, and a February 2019 attack on Indian security forces in Kashmir—the deadliest single terrorist attack in the disputed region since the eruption of an insurgency in 1989.<sup>181</sup>

Following a deadly attack on Indian security forces in Pulwama, Kashmir, in February 2019, India launched an even more daring cross-border raid. For the first time since the Third India–Pakistan War of 1971, the Indian air force crossed the LoC and dropped ordnance inside Pakistan proper (as opposed to disputed Kashmir), targeting several JeM training camps in Khyber Pakhtunkhwa province.<sup>182</sup> Delhi stressed that the “non-military” operation was designed to avoid civilian casualties and was preemptive in nature because India had credible intelligence that JeM was attempting other suicide attacks in the country.

In response, Pakistan launched fighter jets to conduct their own strike on targets located on India’s side of the LoC in Kashmir, prompting a dogfight that resulted in the downing of an Indian MiG-21. Pakistan released the captured MiG-21 pilot days later, ending the brief but dangerous crisis.<sup>183</sup> Nevertheless, both militaries continued to engage in artillery attacks along the disputed border throughout 2019. Pakistan reported more than 45 casualties, including 14 soldiers, from Indian shelling between January 2019 and October 2019. India reported 21 casualties and more than 2,000 cease-fire violations during the same period.<sup>184</sup>

Skirmishes at the LoC accelerated in 2020. In February 2021, Indian Minister of Defence Rajnath Singh informed Parliament that “5,133 instances of ceasefire violations along the Line of Control (LoC) with Pakistan last year [had] resulted in 46 fatalities.”<sup>185</sup> In early 2021, however, India and Pakistan experienced at least a partial diplomatic thaw as both countries dealt with the global COVID-19 pandemic. In February, both countries agreed to observe a strict cease-fire along the LOC,<sup>186</sup> and in March, Pakistan’s Chief of Army Staff, General Qamar Javed Bajwa, declared in a speech that “it is time to bury the past and move forward.”<sup>187</sup> As this book was being prepared, the cease-fire at the LoC was still in force.

In March 2022, India accidentally fired a cruise missile into Pakistan. The unarmed missile flew roughly 100 kilometers into Pakistan and crashed harmlessly without casualties. The Indian government blamed a “technical malfunction” during “routine maintenance.”<sup>188</sup> Pakistan called the launch irresponsible and demanded a “joint probe to accurately establish the facts” in a response that one correspondent characterized as “measured.”<sup>189</sup>

In January 2023, India notified Pakistan that it was seeking modification of the more than six-decade-old Indus Water Treaty, which governs water-sharing arrangements between the two countries, after Pakistan objected to the construction of an Indian dam on the Chenab river.<sup>190</sup>

**India.** During the Cold War, U.S.–Indian military cooperation was minimal except for a brief period during and after the China–India border war in 1962 when the U.S. provided India with supplies, arms, and ammunition. The rapprochement was short-lived, and the U.S. suspended arms and aid to India following the second Indo–Pakistan war in 1965. The relationship was largely characterized by mistrust in the 1970s under the Nixon Administration.

America’s ties with India hit a nadir during the third Indo–Pakistan war in 1971 when the U.S. deployed the aircraft carrier USS *Enterprise* toward the Bay of Bengal in a show of support for Pakistani forces. Months earlier, India had signed a major defense treaty with the Soviet Union. India’s close defense ties to Russia and America’s close defense ties to Pakistan left the two countries estranged for the duration of the Cold War.

Military ties between the U.S. and India have improved significantly over the past two decades,

particularly since the signing of a 10-year defense partnership and civil nuclear deal in 2005.<sup>191</sup> The two sides have established a robust strategic partnership based on mutual concerns about China’s increasingly belligerent behavior and converging interests in countering regional terrorism and promoting a “free and open Indo-Pacific.”<sup>192</sup> The U.S. has supplied India with more than \$25 billion worth of U.S. military equipment since 2008,<sup>193</sup> including C-130J and C-17 transport aircraft, P-8 maritime surveillance aircraft, Chinook airlift helicopters, Apache attack helicopters, artillery batteries, and Firefinder radar.<sup>194</sup> The two countries also have several information-sharing and intelligence-sharing agreements in place, including one that covers commercial shipping in the Indian Ocean.<sup>195</sup>

Defense ties have advanced at an accelerated rate since the election of Prime Minister Modi in 2014. In 2015, the U.S. and India agreed to renew and upgrade their 10-year Defense Framework Agreement. In 2016, the two governments finalized the text of the Logistics Exchange Memorandum of Agreement (LEMOA), which allows each country to access the other’s military supplies and refueling capabilities through ports and military bases, and the U.S. designated India a “major defense partner,” a designation unique to India that is intended to facilitate its access to American defense technology.<sup>196</sup> Since then, Indian and U.S. warships have begun to offer each other refueling and resupply services at sea.<sup>197</sup> In October 2020, U.S. P-8 maritime surveillance aircraft were refueled for the first time at an Indian military base in the Andaman and Nicobar Islands.<sup>198</sup>

America’s strategic and defense ties with India advanced in several important ways during the Trump Administration. In 2018, India was granted STA-1 status, which eases controls on exports of advanced defense technology.<sup>199</sup> India is only the third Asian country after Japan and South Korea to be granted STA-1 status. In the same year, India established a permanent naval attaché representative to U.S. Central Command in Bahrain, fulfilling a long-standing request from New Delhi.

In 2018, the two countries also signed the Communications Compatibility and Security Agreement (COMCASA), which will allow the U.S. to sell India encrypted communications equipment and create secure channels for communication between the Indian and U.S. militaries.<sup>200</sup> In 2020, the U.S.

and India signed the Basic Exchange Cooperation Agreement (BECA), which creates a framework for the sharing of geospatial intelligence.<sup>201</sup>

Beyond these “foundational” or “enabling” military agreements, the two countries have also signed an agreement on Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC)<sup>202</sup> and an Industrial Security Annex (ISA) that allows the U.S. to share classified information with private Indian defense firms.<sup>203</sup> During the Trump Administration, the two countries also initiated a new 2+2 defense and foreign ministers dialogue while reviving the Quad grouping, which joins India and the U.S. with Australia and Japan.<sup>204</sup> In 2020, the four countries held the first Quad naval exercise since 2007. When a deadly crisis erupted at the China–India border in 2020, the Trump Administration provided India with two advanced surveillance drones and cold-weather gear for Indian soldiers.

In recent years, India has made additional purchases of U.S. military hardware, including C-17 transport aircraft, Apache attack helicopters, MH-60R Seahawk multi-mission helicopters, Sig Sauer assault rifles, and M777 ultralight howitzer artillery guns.<sup>205</sup> It also is reportedly considering the purchase of 30 armed MQ-9 reaper drones (10 each for the three branches of its military) for \$3 billion<sup>206</sup> and a half-dozen highly capable P-8I maritime aircraft (to supplement the dozen currently in operation) for nearly \$2 billion.<sup>207</sup>

New Delhi and Washington regularly hold joint annual military exercises across all services. They include the Yudh Abhyas army exercises, Red Flag air force exercises, and Malabar naval exercise, which added Japan and Australia as permanent participants in 2012 and 2020, respectively. In late 2019, India and the U.S. held their first-ever tri-service military exercise, Tiger Triumph.<sup>208</sup>

In February 2022, the U.S. Navy participated for the first time in the Indian Navy–led MILAN naval exercise, a multilateral exercise in the Bay of Bengal that involved the navies of more than a dozen countries. At the April 2022 India–U.S. 2+2 Ministerial Dialogue in Washington, the two sides signed “a Space Situational Awareness arrangement” and “agreed to launch an inaugural Defense Artificial Intelligence Dialogue.”<sup>209</sup> They also committed to exploring the coproduction of Air-Launched Unmanned Aerial Vehicles under the Defense Trade and Technology Initiative (DTTI).

In addition, India agreed “to join the Combined Maritime Forces Task Force...to expand multilateral cooperation in the Indian Ocean,” and the two sides agreed to “explore possibilities of utilizing Indian shipyards for repair and maintenance of ships of the U.S. Maritime Sealift Command to support mid-voyage repair of U.S. Naval ships.”<sup>210</sup> The U.S. Department of Defense assessed that these initiatives “will allow the U.S. and Indian militaries to work more seamlessly together across all domains of potential conflict” and “jointly meet the challenges of this century.”<sup>211</sup>

In October 2022, the U.S. Army conducted joint exercises with the Indian Army in the Himalayas roughly 50 miles from the disputed China–India border. During a visit to India earlier in 2022, “the US Army’s Pacific Commanding General Charles Flynn described China’s military build-up near the disputed border as ‘alarming.’”<sup>212</sup>

In February 2023, the Biden Administration revealed that it was considering an application from General Electric for joint production of jet engines for fighter aircraft that are produced in India. The Biden Administration committed to an “expeditious review” of the application.<sup>213</sup> Jet engine technology is among the United States’ most advanced, valuable, and sensitive military secrets; any technology transfer arrangement that included adequate safeguards would therefore mark a qualitative evolution of the India–U.S. defense partnership to exceed even some of America’s legacy treaty alliances.

### **Quality of Key Allied or Partner Armed Forces in Asia**

Because Asia lacks an integrated, regional security architecture along the lines of NATO, the United States partners with most of the region’s nations on a bilateral basis. This means that there is no single standard to which all of the local militaries aspire; instead, capabilities are influenced by local threat perceptions, institutional interests, physical conditions, historical factors, and budgetary considerations.

Moreover, most Asian militaries have limited combat experience, particularly in high-intensity air or naval combat. Some, like Malaysia, have never fought an external war since gaining independence in the mid-20th century. The Indochina wars—the most recent high-intensity conflicts—are now more

than 50 years in the past. It is therefore unclear how well Asia's militaries have trained for future warfare and whether their doctrines will meet the exigencies of wartime realities.

Based on examinations of equipment, we assess that several Asian allies and friends have substantial potential military capabilities that are supported by robust defense industries and significant defense spending. The defense budgets of Japan, South Korea, and Australia are estimated to be among the world's 15 largest, and the three countries' military forces field some of the world's most advanced weapons, including F-35s in the Japan Air Self Defense Force and ROK Air Force; airborne early warning (AEW) platforms; Aegis-capable surface combatants and modern diesel-electric submarines; and third-generation main battle tanks. As noted, all three nations are also involved in the production and purchase of F-35 fighters.

At this point, both the Japanese and Korean militaries arguably are more capable than most European militaries, at least in terms of conventional forces. Japan's Self Defense Forces and South Korea's military field more tanks, principal surface combatants, and combat-capable aircraft than their European counterparts field.

Both the ROK and Japan are also increasingly interested in developing missile defense capabilities, including joint development and coproduction in the case of Japan. After much negotiation and indecision, South Korea deployed America's Terminal High Altitude Area Defense (THAAD) missile defense system on the peninsula in 2017.<sup>214</sup> South Korea also has the Korea Air and Missile Defense system comprised of Patriot Advanced Capacity-3 (PAC-3) and indigenous Chunggung medium-range missile interceptors and is developing a long-range missile defense system in pursuit of an indigenous missile defense capability.

As for Japan, its Aegis-class destroyers are equipped with SM-3 missiles, and it decided in 2017 to install the Aegis Ashore missile defense system to supplement its Patriot missile batteries.<sup>215</sup> In June 2020, Tokyo unexpectedly cancelled plans to build two Aegis Ashore missile defense sites, citing the potential for the interceptor missile's first-stage booster to fall onto populated areas. Other likely factors in the decision include the overall cost of the program, inept handling of the site-selection process, and government unwillingness to press

national objectives against local resistance.<sup>216</sup> Currently, Tokyo plans to build an additional two Aegis-capable ships to compensate for cancellation of the Aegis Ashore project.

India now has the world's third largest military budget (approximately \$73 billion in 2023) and second largest military (approximately 1.5 million personnel).<sup>217</sup> The Indian Navy is one of the few in the world to operate indigenously developed aircraft carriers and nuclear submarines; it commissioned its first indigenously built aircraft carrier in September 2022 and is now operating a refitted Russian carrier. Both conventional (non-nuclear) carriers are around 45,000 tons; a second, 65,000-ton conventional indigenous carrier is under construction and expected to enter service in the early 2030s.

India also operates 15 diesel electric submarines and one Russian-leased nuclear-powered ballistic missile submarine and has been fielding its own indigenously constructed nuclear-powered ballistic missile submarines since the induction of the *Arihant* in 2016.<sup>218</sup> The second in its class is expected to be commissioned in 2023.<sup>219</sup>

The Indian air force operates several world-class platforms, including American-built P-8 Poseidon surveillance aircraft and Apache attack helicopters, as well as C-130J and C-17 heavy transport aircraft. Its combat aircraft fleet is comprised of European, Russian, and Indian platforms, with the most advanced being the Sukhoi Su-30MKI.

The Indian army deploys a large fleet of Russian-origin tanks, advanced missile defense systems like the S-400, and the U.S.-origin M777 light howitzer. India also hosts advanced ballistic and cruise missile capabilities, including indigenously developed, long-range, nuclear-capable ICBMs and the supersonic, nuclear-capable BrahMos cruise missile developed jointly with Russia.

Although its small population and physical borders limit the size of its military, Singapore fields some of the region's highest-quality forces. Its ground forces can deploy third-generation Leopard II main battle tanks, and its fleet includes four conventional submarines (to be replaced by four new, more capable submarines from Germany)<sup>220</sup> and six frigates and eight missile-armed corvettes. Its air force has F-15E Strike Eagles and F-16s as well as one of Southeast Asia's largest fleets of airborne early warning and control aircraft (G550-AEW aircraft) and two squadrons of aerial refuelers, one



comprised of KC-130 tankers and the second of Airbus A330 Multi Role Tanker Transport aircraft, that can help to extend range or time on station.<sup>221</sup> In January 2020, the U.S. Department of State cleared Singapore to purchase “four short-takeoff-and-vertical-landing F-35 variants with an option for eight more of the ‘B’ models.” Delivery is scheduled to begin in 2026.<sup>222</sup> In February 2023, Singapore exercised an option to expand its order to a total of 12 F-35B airframes.<sup>223</sup>

Australia’s very capable armed forces are smaller than NATO militaries but have major operational experience, having deployed to Iraq and Afghanistan as well as to help the Philippines with its Southern insurgency. The Australian military deploys advanced surveillance aircraft and AWACS, advanced diesel-electric submarines, F-18 and F-35 fighter aircraft, and modern frigates and destroyers. Under the AUKUS arrangement, Australia will purchase three U.S. *Virginia*-class nuclear-powered submarines by the early 2030s, after which Australia and the U.K. will jointly develop a new class of nuclear-powered submarines based on U.S. designs and to be delivered in the late 2030s to early 2040s.<sup>224</sup>

At the other extreme, the Armed Forces of the Philippines are among the region’s weakest military forces. Having long focused on waging counterinsurgency campaigns while relying on the United States for its external security, the Philippines spent only 1.4 percent of GDP on its military in 2022.<sup>225</sup> The most modern ships in the Philippine navy are three former U.S. *Hamilton*-class Coast Guard cutters. The Philippine navy has taken delivery of new South Korean-built frigates and is set to buy several other South Korean-built naval vessels.<sup>226</sup> The Philippines also has purchased 12 light attack fighter aircraft from South Korea<sup>227</sup> and has been cleared to acquire 12 new American F-16s.<sup>228</sup> In January 2022, the Philippines signed a deal worth more than \$374 million to acquire BrahMos supersonic cruise missiles.<sup>229</sup>

The armed forces of American allies from outside the region, particularly those of France and the United Kingdom, should also be mentioned. France has overseas bases in New Caledonia and the South Pacific, locally based assets, and 4,150 personnel in the region.<sup>230</sup> It also conducts multiple naval deployments each year out of Metropolitan France. The U.K. is similarly active in the region and, given its unparalleled integration with U.S. forces, can

employ its capability directly in pursuit of shared objectives. It has a naval logistics facility in Singapore and Royal Gurkhas stationed in Brunei and has been an integral part of a U.S.-led mission to monitor seaborne evasions.

### Current U.S. Presence in Asia

**U.S. Indo-Pacific Command.** Established in 1947 as U.S. Pacific Command (PACOM), USINDOPACOM is the oldest and largest of America’s unified commands. According to its website:

USINDOPACOM protects and defends, in concert with other U.S. Government agencies, the territory of the United States, its people, and its interests. With allies and partners, USINDOPACOM is committed to enhancing stability in the Asia-Pacific region by promoting security cooperation, encouraging peaceful development, responding to contingencies, deterring aggression, and, when necessary, fighting to win. This approach is based on partnership, presence, and military readiness.<sup>231</sup>

USINDOPACOM’s area of responsibility (AOR) includes not only the expanses of the Pacific, but also Alaska and portions of the Arctic, South Asia, and the Indian Ocean. The 36 countries within the command’s AOR represent more than 50 percent of the world’s population and include two of the three largest economies and 10 of the 14 smallest; the most populous nation (India); the largest democracy (India); the largest Muslim-majority nation (Indonesia); and the world’s smallest republic (Nauru). In addition, “[t]he region is a vital driver of the global economy and includes the world’s busiest international sea lanes and nine of the ten largest ports.”<sup>232</sup> By any meaningful measure, the Indo-Pacific is also the world’s most militarized region, with “seven of the world’s ten largest standing militaries and five of the world’s declared nuclear nations.”<sup>233</sup>

USINDOPACOM’s “component and sub-unified commands”<sup>234</sup> include:

- **U.S. Army Pacific.** USARPAC is the Army’s component command in the Pacific. Headquartered in Hawaii and with “more than 107,000 Soldiers and Civilians,”<sup>235</sup> it supplies Army forces as necessary for various global contingencies. The command has 16

subordinate units: 8th Army, I Corps, 25th Infantry Division, 11th Airborne Division, 94th Air & Missile Defense Command, 8th Theater Sustainment Command, 7th Infantry Division, 2nd Infantry Division, 5th Security Force Assistance Brigade, 1st and 3rd Multi-Domain Task Force, 196th Infantry Brigade, 18th Medical Command, 311th Signal Command, U.S. Army Japan, 351st Civil Affairs Command, 9th Mission Support Command, 5th Battlefield Coordination Detachment, and the 500th Military Intelligence Brigade.<sup>236</sup>

- **U.S. Pacific Air Force.** With 46,000 service-members, PACAF is responsible for planning and conducting defensive and offensive air operations in the Asia–Pacific region.<sup>237</sup> It has three numbered air forces under its command: 5th Air Force in Japan; 7th Air Force in Korea; and 11th Air Force, headquartered in Alaska.<sup>238</sup> The 5th Air Force includes the 374th Airlift Wing, 18th Wing, and 35th Fighter Wing. The wings maintain C-130 aircrews, C-12s, UH-1s, F-15s, F-16s, KC-135 refuelers, E-3 Airborne Warning and Control System aircraft, and HH-60G Pave Hawk rescue helicopters. The 7th Air Force operates out of Osan Air Base and Kunsan Air Base, which host the 51st Fighter Wing and 8th Fighter Wing. The wings are made up of three squadrons that include F-16s: the 35th Fighter Squadron, 36th Fighter Squadron, and 80th Fighter Squadron. The 11th Air Force is headquartered in Joint Base Elmendorf–Richardson and is the force provider for Alaskan Command. Other forces that regularly come under PACAF command include B-52, B-1, and B-2 bombers. The 11th Air Force’s 354th Fighter Wing at Eielson Air Force Base completed the integration of 54 “combat-coded” F-35A aircraft in April 2022, increasing the number of squadrons to four.<sup>239</sup>
- **U.S. Pacific Fleet.** PACFLT normally controls all U.S. naval forces committed to the Pacific. Composed of 11 subordinate commands and approximately 200 ships, 1,500 aircraft, and 150,000 military and civilian personnel,<sup>240</sup> PACFLT is organized into the Seventh Fleet, headquartered in Japan, and the Third Fleet, headquartered in California. The Seventh

Fleet includes 50–70 ships and submarines, 150 aircraft, and more than 27,000 sailors and Marines, including the only American carrier strike group (CTF-70, ported at Yokosuka, Japan) and amphibious group (CTF-76, ported at Sasebo, Japan) that are home-ported abroad.<sup>241</sup> The Third Fleet’s AOR extends from the West Coast of the United States to the International Date Line and includes the Alaskan coastline and parts of the Arctic. Third Fleet component units include four carrier strike groups (CSGs). Beginning in 2015, the conduct of Freedom of Navigation Operations (FONOPS) that challenge excessive maritime claims (a part of the Navy’s mission since 1979) has assumed a higher profile because of several well-publicized operations in the South China Sea. Both the Trump and Biden Administrations have maintained a high frequency of these operations.

- **U.S. Marine Forces Pacific.** With its headquarters in Hawaii, MARFORPAC controls elements of the U.S. Marine Corps operating in the Asia–Pacific region.<sup>242</sup> Because of its extensive responsibilities and physical span, MARFORPAC controls two-thirds of Marine Corps forces: the I Marine Expeditionary Force (MEF), centered on the 1st Marine Division, 3rd Marine Air Wing, and 1st Marine Logistics Group, and the III Marine Expeditionary Force, centered on the 3rd Marine Division, 1st Marine Air Wing, and 3rd Marine Logistics Group. The I MEF is headquartered at Camp Pendleton, California, and the III MEF is headquartered on Okinawa, although each has various subordinate elements deployed at any time throughout the Pacific on exercises, to maintain presence, or engaged in other activities. MARFORPAC is responsible for supporting three different commands: It is the U.S. Marine Corps component of USINDOPACOM, provides the Fleet Marine Forces to PACFLT, and provides Marine forces for U.S. Forces Korea (USFK).
- **U.S. Special Operations Command Pacific.** SOCPAC “is a sub-unified command of USSO-COM [U.S. Special Operations Command] under the operational control [of] U.S. Indo-Pacific Command and serves as the functional component for all special operations missions

deployed throughout the Indo-Asia-Pacific region.” Its “area of focus covers 36 countries and encompasses half of the Earth’s surface.”<sup>243</sup> Among the special operations forces under SOCPAC’s control are Navy SEALs; Naval Special Warfare units; Army Special Forces (Green Berets); and Special Operations Aviation units in the Pacific region, including elements in Japan and South Korea. Its core activities include (among others) counterinsurgency and unconventional warfare, hostage rescue and recovery, training of foreign security forces, and support for “DOD humanitarian activities conducted outside the US and its territories to relieve or reduce human suffering, disease, hunger, or privation.”<sup>244</sup>

- **U.S. Forces Korea.** USFK is a USINDOPACOM subordinate-unified command and is stationed in South Korea. It is responsible for organizing, training, and equipping U.S. forces on the Korean Peninsula as directed by USINDOPACOM in support of the U.S.–South Korean Combined Forces Command (CFC) and United Nations Command (UNC). USFK is commanded by a four-star U.S. general who serves concurrently as commander of CFC and UNC.<sup>245</sup>
- **U.S. Forces Japan.** USFJ is a USINDOPACOM subordinate-unified command. It is commanded by a three-star U.S. general who serves concurrently as commander of the Fifth Air Force. USFJ plans, trains, and executes missions to defend Japan and maintain stability in the Indo-Pacific region.<sup>246</sup>

### Key Infrastructure That Enables Expeditionary Warfighting Capabilities

Any planning for operations in the Pacific will inevitably be dominated by the “tyranny of distance.” Because of the extensive distances that must be traversed, even Air Force units will take one or more days to deploy, and ships measure steaming time in weeks. A ship sailing at 20 knots, for instance, requires nearly five days to get from San Diego to Hawaii. From there, it takes seven more days to get to Guam; seven days to Yokosuka, Japan; and eight days to Okinawa—assuming that ships encounter no interference along the way.<sup>247</sup>

China’s growing anti-access/area denial (A2/AD) capabilities, which range from an expanding fleet of modern submarines to anti-ship ballistic and cruise missiles, increase the operational risk for deployment of U.S. forces in the event of conflict. China’s capabilities not only jeopardize American combat forces that would flow into the theater for initial combat, but also would continue to threaten the logistical support needed to sustain American combat power in the ensuing days, weeks, and months.

American basing structure in the Indo-Pacific region, including access to key allied facilities, is therefore both necessary and increasingly at risk.

### American Facilities

**Hawaii.** Much as it was in the 20th century, Hawaii remains the linchpin of America’s ability to support its position in the Western Pacific. If the United States cannot preserve its facilities in Hawaii, both combat power and sustainability become moot. The United States maintains air and naval bases, communications infrastructure, and logistical support on Oahu and elsewhere in the Hawaiian Islands. Hawaii is also a key site for undersea cables that carry much of the world’s communications and data, as well as for satellite ground stations.

**Guam.** The American territory of Guam is located 4,600 miles farther west. Obtained from Spain as a result of the Spanish–American War, Guam became a key coaling station for U.S. Navy ships. It was seized by Japan in World War II, was liberated by U.S. forces in 1944, and after the war became an unincorporated, organized territory of the United States. Key U.S. military facilities on Guam include U.S. Naval Base Guam, which houses several attack submarines and possibly a new aircraft carrier berth, and Andersen Air Force Base, one of a handful of facilities that can house B-2 bombers. U.S. task forces can stage out of Apra Harbor, drawing weapons from the Ordnance Annex in the island’s South Central Highlands. The Marine Corps reopened Marine Corps Base Camp Blaz on January 26, 2023, and in the coming years will host 5,000 Marines comprising various aviation, ground combat, combat support, logistics, and headquarters units.<sup>248</sup> There is also a communications and data relay facility on the island.

Guam’s facilities have improved steadily over the past 20 years. B-2 bombers, for example, began to operate from Andersen Air Force Base in March

2005.<sup>249</sup> These improvements have been accelerated and expanded even as China's A2/AD capabilities have raised doubts about America's ability to sustain operations in the Asian littoral. The concentration of air and naval assets as well as logistical infrastructure on Guam would make it an attractive target in the event of conflict, and the increasing reach of Chinese and North Korean ballistic missiles only adds to this growing vulnerability.

**Saipan.** The U.S. military has noncombatant maritime prepositioning ships (MPS), which contain large amounts of military equipment and supplies, in strategic locations from which they can reach areas of conflict relatively quickly as associated U.S. Army or Marine Corps units located elsewhere arrive in those areas. U.S. Navy units in Saipan, Commonwealth of the Northern Marianas, support prepositioning ships that can supply Army or Marine Corps units deployed for contingency operations in Asia.

### Allied and Other Friendly Facilities

For the United States, access to bases in Asia has long been a vital part of its ability to support military operations in the region. Even with the extensive aerial refueling and replenishment skills of the U.S. Air Force and U.S. Navy, it is still essential that the United States retain access to resupply and replenishment facilities, at least in peacetime. The ability of those facilities to survive and function will directly influence the course of any conflict in the Western Pacific. Moreover, a variety of support functions, including communications, intelligence, and space support, cannot be accomplished without facilities in the region.

Today, maintaining maritime domain awareness or space situational awareness would be extraordinarily difficult without access to facilities in the Asia-Pacific region. The American alliance network is therefore a matter both of political partnership and of access to key facilities on allied soil.

**Japan.** The United States has access to more than 80 different facilities in Japan, including communications stations, military and dependent housing, fuel and ammunition depots, and weapons and training ranges in addition to such major bases as the air bases at Misawa, Yokota, and Kadena and naval facilities at Yokosuka, Atsugi, and Sasebo. The naval facilities support the USS *Ronald Reagan* CSG, which is home-ported in Yokosuka, and

a Navy-Marine Expeditionary Strike Group (ESG) centered on the USS *America*, home-ported at Sasebo. The skilled workforce at places like Yokosuka is needed to maintain American forces and repair equipment in time of conflict. It would take years if not decades to replace them.

This combination of facilities and workforce, in addition to physical location and political support, makes Japan an essential part of any American military response to contingencies in the Western Pacific. Japanese financial support for the American presence also makes these facilities some of the most cost-effective in the world.

The status of one critical U.S. capability has been a matter of public debate in Japan for many years. The U.S. Marine Corps' Third Marine Expeditionary Force, based on Okinawa, is America's rapid reaction force in the Pacific. The Marine Air-Ground Task Force, comprised of air, ground, and logistics elements, enables quick and effective response to crises or humanitarian disasters. To improve the political sustainability of U.S. forces by reducing the impact on the local population in that densely populated area, the Marines are relocating some units to Guam and less-populated areas of Okinawa. The latter includes moving a helicopter unit from Futenma to a new facility in a more remote location in northeastern Okinawa. Because of local resistance, construction of the Futenma Replacement Facility at Camp Schwab will not be completed at least until 2025, but the U.S. and Japanese governments have affirmed their support for the project.

**South Korea.** United States facilities in South Korea are focused on deterring North Korean aggression and preparing for other possible North Korea-related contingencies. The Army maintains major facilities (which in turn control a number of smaller sites) at Daegu, Yongsan in Seoul, and Camps Red Cloud, Casey, and Humphreys. These facilities support the U.S. Eighth Army, which is based in South Korea. In November 2022, the U.S. completed the relocation of its Republic of Korea-United States Combined Forces Command from Yongsan to Camp Humphreys, located 40 miles south of Seoul.<sup>250</sup> South Korea paid 92 percent of the \$11 billion cost of building Camp Humphreys, the largest U.S. base on foreign soil. Other key facilities include air bases at Osan and Kunsan and a naval facility at Chinhae near Pusan.

**The Philippines.** In 1992, the United States ended a nearly century-long presence in the Philippines when it withdrew from its base in Subic Bay as the base's lease expired. The eruption of Mount Pinatubo had already forced the closure of Clark Air Base; the costs of repairing the facility were deemed too high to be worthwhile. In 2014, however, spurred by China's growing assertiveness in the South China Sea, including against Philippine claims such as Mischief Reef (seized in 1995) and Scarborough Shoal (2012), the U.S. and the Philippines negotiated the Enhanced Defense Cooperation Agreement, which allowed for the rotation of American forces through Philippine military bases.

In 2016, the two sides agreed on an initial list of five bases to be used in the Philippines. Geographically distributed across the country, they are Antonio Bautista Air Base in Palawan, closest to the Spratlys; Basa Air Base, located on the main Philippine island of Luzon and closest to the hotly contested Scarborough Shoal; Fort Magsaysay, also on Luzon and the only facility on the list that is not an air base; Lumbia Air Base in Mindanao, where Manila remains engaged in low-intensity combat with Islamist insurgents; and Mactan-Benito Ebuen Air Base in the central Philippines.<sup>251</sup> Construction of a humanitarian assistance and disaster relief warehouse at Basa Air Base was completed in 2018.<sup>252</sup> American F-16s based in South Korea deployed there for a 12-day exercise with Philippine fighter jets in 2019<sup>253</sup> and exercised there again in 2020.<sup>254</sup> In April 2023, four new sites were announced.<sup>255</sup> Naval Base Camilo Osias and Lal-lo Airport are located in Cagayan province in northern Luzon, relatively close to Taiwan across the Bashi Channel, a frequent location of Chinese military activity. Camp Melchor Dela Cruz is also located in northern Luzon in the neighboring province of Isabela. The fourth newly announced site is Balabac Island in Palawan province, which is located in the South China Sea.<sup>256</sup>

In March 2023, a pair of F-22 Raptors alongside support aircraft traveled to Clark Air Base for training and integration with the Philippine Air Force. This is the first time fifth-generation aircraft have operated from the Philippines.<sup>257</sup>

**Singapore.** The United States does not have bases in Singapore, but it is allowed access to several key facilities that provide essential support for American forward presence. Since the closure of its

facilities at Subic Bay, the United States has been allowed to operate the principal logistics command for the Seventh Fleet out of the Port of Singapore Authority's Sembawang Terminal. The U.S. Navy also has access to Changi Naval Base, one of the few docks in the world that can handle a 100,000-ton American aircraft carrier. A small U.S. Air Force contingent operates out of Paya Lebar Air Base to support U.S. Air Force combat units visiting Singapore and Southeast Asia, and Singapore hosts Littoral Combat Ships (LCS) and rotating P-8 aircraft.<sup>258</sup> In April 2023, a U.S. Air Force RQ-4 Global Hawk was sighted operating from Changi Air Base (East) during the first known deployment of that platform to Singapore.<sup>259</sup>

**Australia.** The most prominent element of the U.S. presence in Australia is the deployment of U.S. Marines to Darwin in the northern part of the country. In keeping with Australian sensitivities about permanent American bases on Australian soil, however, the Marines do not maintain a permanent presence in the country.<sup>260</sup> Similarly, the United States jointly staffs the Joint Defence Facility Pine Gap and the Joint Geological and Geophysical Research Station at Alice Springs and has access to the Harold E. Holt Naval Communication Station, including its space surveillance radar system, in western Australia.<sup>261</sup> Pursuant to the 2023 AUKUS agreement, the U.S. will establish a rotational presence of submarines, to be known as Submarine Rotational Force West (SRF-West), as early as 2027.<sup>262</sup>

Finally, the United States is granted access to a number of facilities in Asian states on a contingency or crisis basis. Thus, U.S. Air Force units transited Thailand's U-Tapao Air Base and Sattahip Naval Base during the first Gulf War and during the Iraq War, but they do not maintain a permanent presence there. Additionally, the U.S. Navy conducts hundreds of port calls throughout the region.

**Diego Garcia.** The American facilities on the British territory of Diego Garcia are vital to U.S. operations in the Indian Ocean and Afghanistan and provide essential support for operations in the Middle East and East Asia. The island is home to the Military Sealift Command's Maritime Prepositioning Squadron-2 (MPSRON-2), which works with Maritime Prepositioning Squadron-3 (MPSRON-3) "to deliver a strategic power-projection capability for the Marine Corps, Army and Air Force, known as the Maritime Prepositioning Force (MPF)."<sup>263</sup>

Specifically, “MPF ships deliver a forward presence and rapid crisis response capability by pre-positioning equipment and supplies to various locations at sea.”<sup>264</sup> Several elements of the U.S. global space surveillance and communications infrastructure, as well as basing facilities for the B-2 bomber, are also located on the island.

## Conclusion

The Asian strategic environment is extremely expansive. It includes half the globe and is characterized by a variety of political relationships among states that possess widely varying capabilities. The region includes American allies with relationships dating back to the beginning of the Cold War as well as recently established

states and some long-standing adversaries such as North Korea.

American conceptions of the region must therefore recognize the physical limitations imposed by the tyranny of distance. Moving forces within the region (to say nothing of moving them to it) will take time and require extensive strategic lift assets as well as sufficient infrastructure (such as sea and aerial ports of debarkation that can handle American strategic lift assets) and political support. At the same time, the complicated nature of intra-Asian relations, especially unresolved historical and territorial issues, means that the United States, unlike Europe, cannot necessarily count on support from all of its regional allies in responding to any given contingency.

## Scoring the Asia Operating Environment

As with the operating environments of Europe and the Middle East, we assessed the characteristics of Asia as they could be expected to facilitate or inhibit America’s ability to conduct military operations to defend its vital national interests against threats. Our assessment of the operating environment utilized a five-point scale that ranges from “very poor” to “excellent” conditions and covers four regional characteristics of greatest relevance to the conduct of military operations:

- 1. Very Poor.** Significant hurdles exist for military operations. Physical infrastructure is insufficient or nonexistent, and the region is politically unstable. The U.S. military is poorly placed or absent, and alliances are nonexistent or diffuse.
- 2. Unfavorable.** A challenging operating environment for military operations is marked by inadequate infrastructure, weak alliances, and recurring political instability. The U.S. military is inadequately placed in the region.
- 3. Moderate.** A neutral to moderately favorable operating environment is characterized by adequate infrastructure, a moderate alliance structure, and acceptable levels of regional political stability. The U.S. military is adequately placed.

- 4. Favorable.** A favorable operating environment includes good infrastructure, strong alliances, and a stable political environment. The U.S. military is well placed for future operations.
- 5. Excellent.** An extremely favorable operating environment includes well-established and well-maintained infrastructure, strong and capable allies, and a stable political environment. The U.S. military is exceptionally well placed to defend U.S. interests.

The key regional characteristics consist of:

- a. Alliances.** Alliances are important for interoperability and collective defense, as allies would be more likely to lend support to U.S. military operations. Indicators that provide insight into the strength or health of an alliance include whether the U.S. trains regularly with countries in the region, has good interoperability with the forces of an ally, and shares intelligence with nations in the region.
- b. Political Stability.** Political stability brings predictability for military planners when considering such things as transit, basing, and overflight rights for U.S. military operations. The overall degree of political stability indicates whether U.S. military actions would

be hindered or enabled and reflects, for example, whether transfers of power are generally peaceful and whether there have been any recent instances of political instability in the region.

**c. U.S. Military Positioning.** Having military forces based or equipment and supplies staged in a region greatly facilitates the ability of the United States to respond to crises and presumably achieve success in critical “first battles” more quickly. Being routinely present also helps the United States to maintain familiarity with a region’s characteristics and the various actors that might act to assist or thwart U.S. actions. With this in mind, we assessed whether or not the U.S. military was well positioned in the region. Again, indicators included bases, troop presence, prepositioned equipment, and recent examples of military operations (including training and humanitarian) launched from the region.

**d. Infrastructure.** Modern, reliable, and suitable infrastructure is essential to military operations. Airfields, ports, rail lines, canals, and paved roads enable the U.S. to stage, launch, and logistically sustain combat operations. We combined expert knowledge of regions with publicly available information on critical infrastructure to arrive at our overall assessment of this metric.<sup>265</sup>

For Asia, we arrived at these average scores (rounded to the nearest whole number):

- Alliances: **4—Favorable**
- Political Stability: **3—Moderate**
- U.S. Military Positioning: **4—Favorable**
- Infrastructure: **4—Favorable**

Aggregating to a regional score of: **Favorable**

## Operating Environment: Asia

|                       | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|-----------------------|-----------|-------------|----------|-----------|-----------|
| Alliances             |           |             |          | ✓         |           |
| Political Stability   |           |             | ✓        |           |           |
| U.S. Military Posture |           |             |          | ✓         |           |
| Infrastructure        |           |             |          | ✓         |           |
| <b>OVERALL</b>        |           |             |          | ✓         |           |

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# Conclusion: Scoring the Global Operating Environment

Because the United States is a global power with global security interests, threats to those interests can emerge from any region. The U.S. military must therefore be ready to operate in any region when called upon to do so and must account for the range of conditions that it might encounter when planning for potential military operations. These considerations necessarily inform its decisions about

the types and amounts of equipment it purchases (especially to transport and sustain the force); the location or locations from which it might operate; and how easily it can or cannot project and sustain combat power when engaged with the enemy.

Aggregating the three regional scores provides a global operating environment score of **FAVORABLE** in the *2024 Index*.

## Global Operating Environment

|                | VERY POOR | UNFAVORABLE | MODERATE | FAVORABLE | EXCELLENT |
|----------------|-----------|-------------|----------|-----------|-----------|
| Europe         |           |             |          | ✓         |           |
| Middle East    |           |             | ✓        |           |           |
| Asia           |           |             |          | ✓         |           |
| <b>OVERALL</b> |           |             |          | ✓         |           |

**Europe.** Overall, the European region remains a stable, mature, and friendly operating environment. Russia remains the preeminent military threat to the region, both conventionally and unconventionally, and its invasion of Ukraine marks a serious escalation of its efforts to exert influence on its periphery. China continues to maintain a significant presence in Europe through its propaganda, influence operations, and investments in key sectors. By mitigating the effect of sanctions, it also has significantly enhanced the Russian government's ability to conduct the war in Ukraine. Both NATO and many non-NATO European countries should be increasingly concerned about the behavior and ambitions of both Russia and China, although agreement on a collective response to these challenges remains elusive.

In the *2023 Index*, we noted a strengthening of alliance relationships as NATO member countries conducted reviews of their respective military establishments and the ability of NATO as a whole to coordinate actions. NATO placed renewed emphasis on logistical matters and the extent to which it could respond to an emergent crisis.

In the past year, we have seen a galvanizing effect within political establishments that, while still dynamic and pointed within the domestic context of each country, appear to have made gains in aggregate stability as countries once again focus on national matters that arguably have been neglected since the end of the Cold War. Within specific countries, there are shifts between liberal and conservative governments, but the net result has been generally positive with respect to U.S. security interests,

## Global Operating Environment: Summary



especially as countries commit to improving their defense capabilities, readiness, and posture.

This has led us to increase Europe’s score for political stability from “favorable” to “excellent.” It is difficult to predict whether NATO’s renewed emphasis on collective defense and its reinvigorated defense spending will continue over the long term or is merely a short-term response to Russia’s aggression in Ukraine. Given the potential for Russia to replace its battlefield losses with newer, more modern equipment, NATO defense spending on capability will be an important issue, both in the medium term and over the long term.

Scores for Europe remained largely steady this year as they have in previous years with one exception: As noted, the score for political stability has risen from “favorable” to “excellent.” The *2024 Index* again assesses the European operating environment as “favorable” overall.

**The Middle East.** The Middle East will remain a focus of U.S. military planners for the foreseeable future because of the interests involved and the region’s volatile nature. The Middle East region is now highly unstable, in large measure because of the erosion of authoritarian regimes, the strain on World War I–era borders, and the fact that the region remains a breeding ground for terrorism. Overall, regional security has continued to deteriorate. Iraq has restored its territorial integrity since the defeat of ISIS, but the political situation and future relations with the United States will remain difficult as long as a government that is sympathetic to Iran is in power. U.S. relations in the region will remain generally complex, although this has not stopped the U.S. military from operating as needed.

The supremacy of the nation-state is being challenged in many countries by non-state actors that wield influence and power comparable to those of small states. The region’s primary challenges—continued meddling by Iran and surging transnational terrorism—are made more difficult by Sunni–Shia sectarian divides, the more aggressive nature of Iran’s Islamist revolutionary nationalism, and the proliferation of Sunni Islamist revolutionary

groups. The result could well be further destabilization of the post-pandemic operational environment for U.S. forces.

In the Middle East, the U.S. benefits from operationally proven procedures that leverage bases, infrastructure, and the logistical processes needed to maintain a large force that is forward deployed thousands of miles away from the homeland. The personal links between allied armed forces are also present, and joint training exercises improve interoperability and provide an opportunity for the U.S. to influence some of the region’s future leaders.

America’s relationships in the region are based pragmatically on shared security and economic concerns. As long as these issues remain relevant to both sides, the U.S. is likely to have an open door to operate in the Middle East when its national interests require that it do so.

Although circumstances in all measured areas vary throughout the year, in general terms, the *2024 Index* assesses the Middle East operating environment as “moderate,” but the region’s political stability continues to be “unfavorable,” and its overall score could decline to “poor” in the future if current trends toward further instability continue.

**Asia.** The Asian strategic environment includes half of the globe and is characterized by a variety of political relationships among states with wildly varying capabilities. This makes Asia far different from Europe, which in turn makes America’s relations with the region different from its relations with Europe. American conceptions of Asia must recognize the physical limitations imposed by the tyranny of distance and the need to move forces as necessary to respond to challenges from China and North Korea.

The complicated nature of intra-Asian relations and the lack of an integrated, regional security architecture along the lines of NATO make the defense of U.S. security interests in Asia more challenging than many Americans appreciate. However, the U.S. has strong relations with allies in the region, and their willingness to host bases helps to offset the vast distances that must be covered.

The militaries of Japan and the Republic of Korea are larger and more capable than European militaries, and both countries are interested in developing missile defense capabilities that will be essential in combatting the regional threat posed by North Korea. In Japan, public awareness of the need to adopt a more “normal” military posture in response to China’s increasingly aggressive actions continues to grow. This indicates a break with the pacifist tradition among the Japanese that has lasted since the end of World War II and could lead to improved military capabilities and the prospect of joining the U.S. in defense measures beyond the immediate vicinity of Japan.

We continue to assess the Asia region as “favorable” to U.S. interests in terms of alliances, overall political stability, militarily relevant infrastructure, and the presence of U.S. military forces.

Summarizing the condition of each region enables us to get a sense of how they compare in terms of the difficulty that would be involved in projecting U.S. military power and sustaining combat operations in each one. As a whole, the global operating environment maintains a score of “favorable,” which means that the United States should be able to project military power anywhere in the world to defend its interests without substantial opposition or high levels of risk.





# Threats to U.S. Vital Interests



# Assessing Threats to U.S. Vital Interests

Because the United States is a global power with global interests, scaling its military power to threats requires judgments with regard to the importance and priority of those interests, whether the use of force is the most appropriate and effective way to address the threats to those interests, and how much and what types of force are needed to defeat such threats.

This *Index* focuses on three fundamental, vital national interests:

- Defense of the homeland;
- Successful conclusion of a major war that has the potential to destabilize a region of critical interest to the U.S.; and
- Preservation of freedom of movement within the global commons: the sea, air, outer space, and cyber-space domains through which the world conducts business.

The geographical focus of the threats in these areas is further divided into three broad regions: Asia, Europe, and the Middle East.

Obviously, these are not America's only interests. Among many others are the growth of economic freedom in trade and investment, the observance of internationally recognized human rights, and the alleviation of human suffering beyond our borders. None of these other interests, however, can be addressed principally and effectively by the use of military force, and threats to them would not necessarily result in material damage to the foregoing vital national interests. Therefore, however important these additional American interests may be, we do not use them in assessing the adequacy of current U.S. military power.

There are many publicly available sources of information on the status, capabilities, and activities

of countries with respect to military power. Perhaps the two most often cited as references are *The Military Balance*, published annually by the London-based International Institute for Strategic Studies,<sup>1</sup> and the "Annual Threat Assessment of the U.S. Intelligence Community."<sup>2</sup> The former is an unmatched resource for researchers who want to know, for example, the strength, composition, and disposition of a country's military services. The latter serves as a reference point produced by the Office of the Director of National Intelligence (ODNI).

Comparison of our detailed, reviewed analysis of specific countries with both *The Military Balance* and the ODNI's "Annual Threat Assessment" reveals two stark limitations in these external sources.

- *The Military Balance* is an excellent, widely consulted source, but is primarily a count of military hardware, often without context in terms of equipment capability, maintenance and readiness, training, manpower, integration of services, doctrine, or the behavior of competitors—those that threaten the national interests of the U.S. as defined in this *Index*. Each edition of *The Military Balance* includes topical essays and a variety of focused discussions about some aspect of a selected country's capabilities, but there is no overarching assessment of military power referenced against a set of interests, potential consequences of use, or implications for the interaction of countries.
- The ODNI's "Annual Threat Assessment" omits many threats, and its analysis of those that it does address is limited. Moreover, it does not reference underlying strategic dynamics that are key to the evaluation of threats and that may be more predictive of future threats than is a simple extrapolation of current events.

## Threat Categories

|            |            |            |         |              |          |
|------------|------------|------------|---------|--------------|----------|
| Behavior   | HOSTILE    | AGGRESSIVE | TESTING | ASSERTIVE    | BENIGN   |
| Capability | FORMIDABLE | GATHERING  | CAPABLE | ASPIRATIONAL | MARGINAL |

We suspect that this is a consequence of the U.S. intelligence community’s withholding from public view its very sensitive assessments, which are derived from classified sources and/or result from analysis of unclassified, publicly available documents with the resulting synthesized insights becoming classified by virtue of what they reveal about U.S. determinations and concerns. The need to avoid the compromising of sources, methods of collection, and national security findings makes such a policy understandable, but it also causes the ODNI’s annual threat assessments to be of limited value to policymakers, the public, and analysts working outside of the government. Consequently, we do not use the ODNI’s assessment as a reference, given its quite limited usefulness, but trust that the reader will double-check our conclusions by consulting the various sources cited in the following pages as well as other publicly available reporting that is relevant to challenges to core U.S. security interests that are discussed in this section.

Measuring or categorizing a threat is problematic because there is no absolute reference that can be used in assigning a quantitative score. Two fundamental aspects of threats, however, are germane to this *Index*: the threatening entity’s desire or intent to achieve its objective and its physical ability to do so. Physical ability is the easier of the two to assess; intent is quite difficult. A useful surrogate for intent is observed behavior because this is where intent becomes manifest through action. Thus, a provocative, belligerent pattern of behavior that seriously threatens U.S. vital interests would be very worrisome. Similarly, a comprehensive ability to accomplish objectives even in the face of U.S. military power would be of serious concern to U.S. policymakers, and weak or very limited abilities would lessen U.S. concern even if an entity behaved provocatively vis-à-vis U.S. interests. It is the combination of the two—behavior and capability—that informs our final score for each assessed actor.

Each categorization used in this *Index* conveys a word picture of how troubling a threat’s behavior

and set of capabilities have been during the assessed year. The five ascending categories for observed behavior are:

- Benign,
- Assertive,
- Testing,
- Aggressive, and
- Hostile.

The five ascending categories for physical capability are:

- Marginal,
- Aspirational,
- Capable,
- Gathering, and
- Formidable.

As noted, these characterizations—behavior and capability—form two halves of an overall assessment of the threats to U.S. vital interests.

The most current and relatable example of this interplay between behavior and capability is Russia’s brutal assault on Ukraine. Throughout its buildup of forces along its border with Ukraine during 2021, Russia consistently downplayed observers’ concerns that its actions were a prelude to war. Regardless of its protestations, however, one could not dismiss the potential for grievous harm that was inherent in Russia’s forces and their disposition. Russia’s behavior, combined with the military capability it had deployed in posture and geographic position, belied its official pronouncements.

The same thing can be said about China, Iran, and North Korea. Each country typically rejects observers' concerns that its military activities, posturing, and investments threaten the interests of neighbors and distant competitors like the U.S., but no rational country can ignore the potential inherent in the forces these countries are fielding, the investments they are making in improving and expanding their capabilities, and the pattern of behavior they exhibit that reveals regime preferences for intimidation and coercion over diplomacy and mutually beneficial economic interaction.

It is therefore in the core interest of the United States to take stock of the capabilities and behaviors of its chief adversaries as it considers the status of its own military forces.

We always hold open the potential to add or delete from our list of threat actors. The inclusion of any state or non-state entity is based solely on our assessment of its ability to present a meaningful challenge to a critical U.S. interest during the assessed year.

## Endnotes

1. For the most recent of these authoritative studies, see International Institute for Strategic Studies, *The Military Balance 2023: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2023), <https://www.iiss.org/publications/the-military-balance> (accessed June 7, 2023).
2. See Office of the Director of National Intelligence, "Annual Threat Assessment of the U.S. Intelligence Community," February 6, 2023, <https://www.odni.gov/files/ODNI/documents/assessments/ATA-2023-Unclassified-Report.pdf> (accessed June 7, 2023). Issued before 2021 as "Worldwide Threat Assessment of the US Intelligence Community," or WWTA.



# China

Bryan Burack and Andrew J. Harding

**T**he People’s Republic of China (PRC) represents the greatest military threat facing the U.S. today. The 2022 National Security Strategy frames the PRC as “America’s most consequential geopolitical challenge” and “the only competitor with both the intent to reshape the international order and, increasingly, the economic, diplomatic, military, and technological power to do it.”<sup>1</sup> The 2022 National Defense Strategy adds that:

The comprehensive and serious challenge to U.S. national security is the PRC’s coercive and increasingly aggressive endeavor to refashion the Indo-Pacific region and the international system to suit its interests and authoritarian preferences. The PRC seeks to undermine U.S. alliances and security partnerships in the Indo-Pacific region, and leverage its growing capabilities, including its economic influence and the People’s Liberation Army’s (PLA) growing strength and military footprint, to coerce its neighbors and threaten their interests. The PRC’s increasingly provocative rhetoric and coercive activity towards Taiwan are destabilizing, risk miscalculation, and threaten the peace and stability of the Taiwan Strait. This is part of a broader pattern of destabilization and coercive PRC behavior that stretches across the East China Sea, the South China Sea, and along the Line of Actual Control [with India]. The PRC has expanded and modernized nearly every aspect of the PLA, with the focus on offsetting U.S. military advantages. The PRC is therefore the pacing challenge for the Department [of Defense].<sup>2</sup>

In recent years, the PRC has been acting more aggressively in the Indo-Pacific, particularly with

regard to its territorial disputes in the South China Sea, in the East China Sea, along the China–India border, and in the Taiwan Strait.

The Communist Party of China (CCP) held its 20th Party Congress from October 16 to 22, 2022. General Secretary Xinping’s report “focused on intensifying and accelerating the People’s Liberation Army’s modernization goals over the next five years, including strengthening its ‘system of strategic deterrence.’”<sup>3</sup> According to the DOD’s 2022 report on *Military and Security Developments Involving the People’s Republic of China*:

The military dimensions of the Report to [the] 20th Party Congress focused on intensifying and accelerating the People’s Liberation Army’s modernization goals, to include deploying PLA forces on a “regular basis and in diversified ways.” In order to achieve the PLA’s 2027 centenary goal, the 20th Party Congress set objectives “to provide new military strategic guidance, establish a strong system of strategic deterrence, increase the proportion of new-domain forces (most likely cyberspace and space) with new combat capabilities, speed up the development of unmanned, intelligence combat capabilities, and promote the development and application of the network information system.”<sup>4</sup>

**The DOD report further reflects that, among other notable developments:**

- In 2021, the People’s Liberation Army Navy (PLAN) “resumed series construction of the JIANGKAI II class frigate.”<sup>5</sup>

- “[D]omestically built aircraft and a wide range of UAVs [unmanned aerial vehicles]” continue to modernize the People’s Liberation Army Air Force (PLAAF).<sup>6</sup>
- “In 2021, the PLARF [People’s Liberation Army Rocket Force] launched approximately 135 ballistic missiles for testing and training. This was more than the rest of the world combined, excluding ballistic missile deployment in conflict zones.”<sup>7</sup>
- In 2021, “the PRC continued building three solid-fueled intercontinental ballistic missile (ICBM) silo fields, which will cumulatively contain at least 300 new ICBM silos.”<sup>8</sup>
- “[T]he PRC’s operational nuclear warhead stockpile has surpassed 400,” and “[i]f China continues the pace of its nuclear expansion, it will likely field a stockpile of about 1500 warheads by its 2035 timeline.”<sup>9</sup>
- The ability to deny U.S. access to areas around China or to deny that ability of U.S. forces to operate within range of Chinese weapons, often referred to as anti-access/area denial (A2/AD) capabilities, is credible within the First Island Chain and increasingly projecting into the Philippine Sea and Pacific Ocean.<sup>10</sup>
- Deployment of the DF-17 hypersonic glide vehicle (HGV) “will continue to transform the PLA’s missile force.”<sup>11</sup>
- China is increasingly interested in counter-space capabilities that can “deter and counter third-party intervention during a regional military conflict.”<sup>12</sup>

The CCP is still heavily influenced by Marxist-Leninist ideology.<sup>13</sup> As neatly summarized by Australian expert John Garnaut, “[t]he key point about Communist Party ideology—the unbroken thread that runs from Lenin through Stalin, Mao and Xi—is that the party is and always has defined itself as being in perpetual struggle with the ‘hostile’ forces of Western liberalism.”<sup>14</sup> Today, “[f]or the first time since Mao we have a leader [in Xi Jinping] who talks and acts like he really means it.”<sup>15</sup>

The CCP’s ideology consistently animates it to invest in military capabilities and activities that pose substantial challenges to U.S. interests. Moreover, with a GDP of over \$18 trillion—second only to that of the U.S.—China has the economic foundations to sustain an unprecedented military modernization effort while advancing efforts to dominate critical next-generation technologies and supply chains that are vital to the health of the U.S. economy and the U.S. military. From crucial minerals to pharmaceuticals, renewables, artificial intelligence, and missile technology, China is a global economic power and the largest trading partner of a majority of global capitals.

In short, China has become “the greatest external threat America has faced since the collapse of the USSR.”<sup>16</sup>

### Threats to the Homeland

With more than 2 million active military personnel, the People’s Liberation Army remains one of the world’s largest militaries, and its days of largely obsolescent equipment are in the past.<sup>17</sup> In March 2023, China announced a draft defense budget of \$224.79 billion, an increase of 7.2 percent, marking the eighth consecutive year of single-digit increases.<sup>18</sup> The PRC defense budget has increased each year for more than two decades, “sustaining [China’s] position as the second-largest military spender in the world.”<sup>19</sup> From the late 1990s to the mid-2010s, China’s official defense budget increased by double-digit percentages nearly every year.<sup>20</sup>

Reporting has been inconsistent, however, and it is estimated that China spends more on defense than it officially acknowledges.<sup>21</sup> This spending has been complemented by improvements in Chinese military training and, in 2015, the largest reorganization in the PLA’s history.<sup>22</sup> The PLA has lost 300,000 personnel since those reforms, but its overall capabilities have increased as newer, much more sophisticated systems have replaced older platforms.<sup>23</sup>

**PLA Army.** The PLA Army (PLAA) is no longer automatically in charge of war zones or higher headquarters functions. This is due to the 2015 reorganization that established separate ground forces headquarters and bureaucracy; previously, the ground forces had been the default service providing staffs and commanders. At the same time, the PLAA has steadily modernized its capabilities,



incorporating both new equipment and a new organization. The PLAA currently “has approximately 975,000 active-duty personnel in combat units” and is the PLA’s “primary ground fighting force.”<sup>24</sup> The force is increasingly equipped with modern armored fighting vehicles, air defenses, both tube and rocket artillery, and electronic support equipment.

PLAA brigades participate in annual exercises, including STRIDE-2021, and joined the ZAPAD/INTERACTION-2021 exercise, the first specialty exercise conducted by the PLAA in 2021 that included combined training with the Russian military on Chinese soil. ZAPAD/INTERACTION-2021 included “theoretical and systems training, weapon swaps, and a culminating exercise to further understanding and cooperation between the two militaries.”<sup>25</sup>

**PLA Navy.** Between 2015 and 2020, the PLAN “surpassed the U.S. Navy in numbers of battle force ships (meaning the types of ships that count toward the quoted size of the U.S. Navy).”<sup>26</sup> Today, according to the U.S. Department of Defense:

The PLAN is the largest navy in the world with a battle force of approximately 340 platforms, including major surface combatants, submarines, aircraft carriers, ocean-going amphibious ships, mine warfare ships, and fleet auxiliaries. In 2021, the PLAN’s overall battle force shrank due to the transfer of 22 early flight JIANGD-AO clad corvettes to the China Coast Guard. This figure does not include 85 patrol combatants and craft that carry anti-ship cruise missiles (ASCMs). The PLAN’s overall battle force is expected to grow to 400 ships by 2025 and 440 ships by 2030.<sup>27</sup>

The PLAN has fielded increasingly sophisticated and capable multi-role ships. Multiple classes of surface combatants are now in series production, including the Type 055 cruiser and the Type 052C and Type 052D guided missile destroyers, each of which fields long-range surface-to-air missile (SAM) and anti-ship cruise missile systems, as well as the Type 054 frigate and Type 056 corvette.

The PLAN has similarly been modernizing its submarine force. Since 2000, it has consistently fielded between 50 and 60 diesel-electric submarines, but the age and capability of the force have been improving as older boats, especially 1950s-vintage *Romeo*-class boats, have been replaced with

newer designs. These include a dozen *Kilo*-class submarines purchased from Russia and domestically designed and manufactured *Song* and *Yuan* classes. All of these are believed to be capable of firing both torpedoes and anti-ship cruise missiles.<sup>28</sup> The Chinese have also developed variants of the *Yuan*, with an air-independent propulsion (AIP) system that reduces the boats’ vulnerability by removing the need to use noisy diesel engines to recharge batteries, and are “expected to produce a total of 25 or more YUAN class submarines by 2025.”<sup>29</sup>

The PLAN has been expanding its amphibious assault capabilities as well. The PLA Marine Corps (PLANMC), for example, is China’s counterpart to the U.S. Marine Corps. According to the DOD:

The PLANMC is still in the process of completing expansion requirements set forth by the CMC under PLA reform in 2016. Serving as the PLAN land combat arm, the PLANMC continued to evolve throughout 2021 and is receiving equipment and training necessary to become the PLA’s preeminent expeditionary force, as directed by Xi Jinping. All six PLANMC maneuver brigades have achieved initial operating capability (IOC); three brigades are assessed to be fully mission capable. Two other PLANMC brigades—the aviation brigade and special operations brigade, are IOC and Full Operational Capability (FOC), respectively. The aviation brigade will likely not achieve FOC status until at least 2025 and likely beyond, based on the current pace [at which] the brigade is receiving new helicopters, fully trained flight crews, and support equipment.<sup>30</sup>

To move this force, the Chinese have begun to build more amphibious assault ships, including Type 071 amphibious transport docks.<sup>31</sup> Each can carry about 800 naval infantrymen and move them to shore by means of four air-cushion landing craft and four helicopters.

Supporting these expanded naval combat forces is a growing fleet of support and logistics vessels. The 2010 PRC defense white paper noted the accelerated construction of “large support vessels.” It also noted specifically that the navy is exploring “new methods of logistics support for sustaining long-time maritime missions.”<sup>32</sup> These include tankers and fast combat support ships that

extend the range of Chinese surface groups and allow them to operate for more prolonged periods away from main ports. Chinese naval task forces dispatched to the Gulf of Aden have typically included such vessels.

The PLAN has also been expanding its naval aviation capabilities, the most publicized element of which has been the growing Chinese carrier fleet. This currently includes not only the *Liaoning*, purchased from Ukraine over a decade ago, but a domestically produced copy, the *Shandong*, that completed its first exercise in 2021.<sup>33</sup> Both of these ships have ski jumps for their air wing, but the Chinese are also building several conventional takeoff/barrier landing (CATOBAR) carriers (like American or French aircraft carriers) that will employ catapults and therefore allow their air complement to carry more ordnance and/or fuel.<sup>34</sup> It is expected that the PRC's second domestically built carrier, the *Fujian*, will be operational by 2024.<sup>35</sup>

The PLAN's land-based element is modernizing as well, with a variety of long-range strike aircraft, anti-ship cruise missiles, and unmanned aerial vehicles (UAVs) entering the inventory. In addition to more modern versions of the H-6 twin-engine bomber (a version of the Soviet/Russian Tu-16 Badger), the PLAN's Naval Aviation force has added a range of other strike aircraft to its inventory. These include the JH-7/FBC-1 Flying Leopard, which can carry between two and four YJ-82 anti-ship cruise missiles, and the Su-30 strike fighter.

**PLA Air Force.** The PLA Air Force (PLAAF) and PLA Aviation together form Asia's largest air force and the world's third largest. Of its more than 2,800 aircraft, 2,250 are combat aircraft, including fighters, strategic bombers, tactical bombers, multi-mission tactical, and attack aircraft.<sup>36</sup> The force has shifted steadily from one that is focused on homeland air defense to one that is capable of power projection, including long-range precision strikes against both land and maritime targets. The DOD's 2022 report on Chinese capabilities notes that:

[T]he PLAAF is seeking to extend its power projection capability with the development of a new H-20 stealth strategic bomber, with official PRC state media stating that this new stealth bomber will have a nuclear mission in addition to filling conventional roles. The PLAAF is also developing new

medium-[range] and long-range stealth bombers to strike regional and global targets. PLAAF leaders publicly announced the program in 2016, however it may take more than a decade to develop this type of advanced bomber.<sup>37</sup>

The PLAAF currently has 1,800 fighters, more than 800 of which are fourth-generation fighters that are comparable to the U.S. F-15, F-16, and F-18.<sup>38</sup> They include the domestically designed and produced J-10 as well as the Su-27/Su-30/J-11 system, which is comparable to the F-15 or F-18 and dominates both the fighter and strike missions.<sup>39</sup>

China has made progress on two fifth-generation stealth fighter designs. The J-20, the larger of the two aircraft and resembling the American F-22 fighter, has been operationally fielded. Prospective upgrades may include increasing the number of air-to-air missiles, installing thrust-vectoring engine nozzles, and adding super-cruise capability through the installation of higher-thrust WS-15 engines.<sup>40</sup> The J-31, which is currently not operational, appears to resemble the F-35, but with two engines rather than one. The production of advanced combat aircraft engines remains one of the greatest challenges to Chinese fighter design.

The PLAAF is also deploying increasing numbers of H-6 bombers, which can undertake longer-range strike operations including operations employing land-attack cruise missiles. Although the H-6, like the American B-52 and Russian Tu-95, is a 1950s-era design copied from the Soviet-era Tu-16 Badger bomber, the latest versions (H-6K) are equipped with updated electronics and engines and are made of carbon composites. In addition, China is developing the H-20, a flying wing-type stealth bomber that is probably similar to the U.S. B-2.<sup>41</sup>

Equally important, the PLAAF has been introducing a variety of support aircraft, including airborne early warning (AEW), command and control (C2), and electronic warfare (EW) aircraft. These systems field state-of-the-art radars and electronic surveillance systems that allow Chinese air commanders to detect potential targets, including low-flying aircraft and cruise missiles, more quickly and gather additional intelligence on adversary radars and electronic emissions. China's combat aircraft are also increasingly capable of undertaking mid-air refueling, which allows them to conduct

extended, sustained operations, and the Chinese aerial tanker fleet, which is based on the H-6 aircraft, has been expanding.

At the biennial Zhuhai Air Show, Chinese companies have displayed a variety of unmanned aerial vehicles that reflect substantial investments and research and development efforts. The surveillance and armed UAV systems include the Xianglong (Soaring Dragon) and Sky Saber systems. The DOD's 2019 report on Chinese capabilities stated that China had "successfully tested the AT-200, which it claims is the 'world's first large cargo UAV,'" and further specified that "[t]his drone can carry up to 1.5 tons of cargo and... may be especially suited to provide logistic support to PLA forces in the South China Sea."<sup>42</sup> Chinese UAVs have been included in various military parades over the past several years, suggesting that they are being incorporated into Chinese forces, and the DOD's 2022 report on Chinese capabilities states that "[t]he PLAAF is rapidly catching up to Western air forces and continues to modernize with the delivery of domestically built aircraft and a wide range of UAVs."<sup>43</sup>

The PLAAF is also responsible for the Chinese homeland's strategic air defenses. Its array of surface-to-air missile batteries is one of the world's largest and includes the Russian S-300 (SA-10B/SA-20) and its Chinese counterpart, the Hongqi-9 long-range SAM. The S-400 series of Russian long-range SAMs, delivery of which began in 2018, mark a substantial improvement in PLAAF air defense capabilities, as the S-400 has both anti-aircraft and anti-missile capabilities.<sup>44</sup> China has deployed these SAM systems in a dense, overlapping belt along its coast, protecting the nation's economic center of gravity. Key industrial and military centers such as Beijing are also heavily defended by SAM systems.

China's airborne forces are part of the PLAAF. The 15th Airborne Corps has been reorganized from three airborne divisions to six airborne brigades in addition to a special operations brigade, an aviation brigade, and a support brigade. These forces have been incorporating indigenously developed airborne mechanized combat vehicles for the past decade, giving them more mobility and a better ability to engage armored forces.

**PLA Rocket Force.** Chinese nuclear forces are the responsibility of the PLA Rocket Force, one of three new services created on December 31, 2015. China's nuclear ballistic missile forces include

land-based missiles with a range of 13,000 kilometers that can reach the U.S. and CSS-4 and submarine-based missiles that can reach the U.S. when the submarine is deployed within missile range. The DOD "estimates that the PRC's operational nuclear warheads stockpile has surpassed 400."<sup>45</sup> The PLARF "ICBM arsenal consists of approximately 300 ICBMs, including fixed and mobile launchers capable of launching unitary and multiple reentry vehicles."<sup>46</sup>

The PRC became a nuclear power in 1964 when it exploded its first atomic bomb as part of its "two bombs, one satellite" effort. China then exploded its first thermonuclear bomb in 1967 and orbited its first satellite in 1970, demonstrating the capability to build a delivery system that can reach the ends of the Earth. China chose to rely primarily on a land-based nuclear deterrent instead of developing two or three different basing systems as the United States did.

Unlike the United States or the Soviet Union, China chose to pursue only a minimal nuclear deterrent and fielded only a small number of nuclear weapons: 100–150 weapons on medium-range ballistic missiles and approximately 60 ICBMs. Its only ballistic missile submarine (SSBN) conducted relatively few deterrence patrols (perhaps none),<sup>47</sup> and its first-generation submarine-launched ballistic missile (SLBM), the JL-1, if it ever attained full operational capability had limited reach. The JL-1's 1,700-kilometer range makes it comparable to the first-generation Polaris A1 missile fielded by the U.S. in the 1960s.

After remaining stable for several decades, China's nuclear force became part of Beijing's two-decade modernization effort. The result has been both modernization and expansion of the Chinese nuclear deterrent. The core of China's ICBM force is the DF-31 series, a solid-fueled, road-mobile system, along with a growing number of longer-range, road-mobile DF-41 missiles that are now in the PLA operational inventory. The DOD's 2022 report on China's capabilities states that the PRC is now "fielding the DF-41, China's first road-mobile and silo-based ICBM with MIRV capability."<sup>48</sup> China's medium-range nuclear forces have similarly shifted to mobile, solid-rocket systems so that they are both more survivable and more easily maintained.

Imagery analysts at several think tanks have discovered at least three fields of silos under

construction in western China.<sup>49</sup> Each field appears to contain around 100 silos, indicating that China could dramatically expand its land-based nuclear deterrent component. In 2021 alone, “the PLARF launched approximately 135 ballistic missiles for testing and training, more than the rest of the world combined excluding ballistic missile employment in combat zones.”<sup>50</sup> DOD assesses that as China constructs new nuclear facilities, it “intends to use this infrastructure to produce nuclear warhead material for its military in the near term.” Two CFR-600 sodium-cooled fast breeder nuclear reactors are being constructed at Xaipu, for example, and each is “capable of producing enough plutonium for dozens of nuclear warheads annually.”<sup>51</sup>

Notably, the Chinese are also expanding their ballistic missile submarine fleet. According to the DOD:

Over the past 15 years, the PLAN has constructed twelve nuclear submarines—two SHANG I class SSNs (Type 093), four SHANG II class SSNs (Type 093A), and six JIN class SSBNs (Type 094). Equipped with the CSS-N-14 (JL-2) submarine-launched ballistic missile (SLBM) (7,200KM), the PLAN’s six operational JIN class SSBNs represent the PRC’s first credible sea-based nuclear deterrent.<sup>52</sup>

In addition, each of China’s JIN-class SSBNs “is equipped to carry up to 12 JL-2 or JL-3 SLBMs.”<sup>53</sup>

There is some possibility that the Chinese nuclear arsenal now contains land-attack cruise missiles. The CJ-20, a long-range, air-launched cruise missile carried on China’s H-6 bomber, may be nuclear-tipped, although the evidence that China has pursued such a capability is admittedly limited. China is also believed to be working on a cruise missile submarine that, if equipped with nuclear cruise missiles, would further expand the range of its nuclear attack options.<sup>54</sup>

As a result of China’s modernization efforts, its nuclear forces appear to be shifting from a minimal deterrent posture, suited only to responding to an attack and then only with limited numbers, to a more robust but still limited deterrent posture. The PRC will still likely field fewer nuclear weapons than either the United States or Russia, but it will field a more modern and diverse set of capabilities than India, Pakistan, or North Korea, its

nuclear-armed neighbors, are capable of fielding. If there are corresponding changes in doctrine, China will have at least limited nuclear options from which to choose in the event of a conflict.

This assessment changes, however, if the missiles going into the newly discovered silos are equipped with MIRVs (multiple independently targetable reentry vehicles). With five MIRVs atop each missile, for example, 300 new ICBMs would have some 1,500 warheads—equivalent to the U.S. and Russian numbers allowed under New START. Even with fewer than 300 ICBMs, the new SLBMs and new bombers would enable China, within a few years, to field as large a nuclear force as the United States or Russia are capable of fielding.

In addition to strategic nuclear forces, the PLARF has responsibility for medium-range and intermediate-range ballistic missile (MRBM and IRBM) forces. These include (among others) the DF-21 MRBM, which has a range of approximately 1,500 kilometers, and the DF-26 IRBM, which has a range of approximately 3,000 kilometers and is “capable of conducting precision conventional or nuclear strikes against ground targets as well as conventional strikes against naval targets.”<sup>55</sup> It is believed that Chinese missile brigades equipped with these systems may have both nuclear and conventional responsibilities, making any deployment from garrison much more ambiguous from a stability perspective. The expansion of these forces also raises questions about the total number of Chinese nuclear warheads.

While it is unclear whether they are nuclear-armed, China’s hypersonic glide vehicles also pose a growing threat to the United States and its allies. Hypersonic glide vehicles are slower than ICBMs—Mach 5 for a hypersonic vehicle as opposed to Mach 25 for an ICBM warhead—but are designed to maneuver during their descent, making interception far more difficult. During a Chinese test in August 2021, a hypersonic vehicle apparently went into orbit.<sup>56</sup> This creates a fundamentally different threat, as a fractional orbital bombardment system (FOBS) could allow attacks from southern trajectories—that is, from over the South Pole—or even the placement of warheads in orbit, which would make them almost impossible to intercept. Even without a nuclear warhead, an orbiting hypersonic vehicle could do enormous damage to a city or a military facility such as an air base or an ICBM

silos. Because of the strategic instability that FOBS programs would introduce, neither the U.S. nor the Soviet Union ever pursued them.

**PLA Strategic Support Force.** The PLA's major 2015 reorganization included creation of the PLA Strategic Support Force (PLASSF). Strategic space, cyber, electronic, information, communications, and psychological warfare missions and capabilities are centralized under the PLASSF.<sup>57</sup> Previously, these capabilities had been embedded in different departments across the PLA's General Staff Department and General Armaments Department. By consolidating them into a single service, the PLA has created a Chinese "information warfare" force that is responsible for offensive and defensive operations in the electromagnetic and space domains.

The PLASSF has an estimated 175,000 personnel.<sup>58</sup> The SSF Space Systems Department handles most PLA space operations and operates at least eight bases.<sup>59</sup> The PLA views space superiority as critical for winning "informatized warfare" and likely considers it a deterrent and countermeasure against any possible U.S. military interventions during a regional military contingency.<sup>60</sup> The SSF Network Systems Department implements the PLA's "Three Warfares" concept, "which comprises psychological warfare, public opinion warfare, and legal warfare," and "is the only publicly known organization in the PLA that performs psychological warfare operations."<sup>61</sup>

Chinese network warfare forces are known to have conducted a variety of cyber and network reconnaissance operations as well as cyber economic espionage. In 2014, the U.S. Department of Justice charged PLA officers from Unit 61398, then a unit in the General Staff Department's 3rd Department, with the theft of intellectual property and implanting of malware in various commercial firms.<sup>62</sup> Members of that unit are thought also to be part of Advanced Persistent Threat-1, a group of computer hackers believed to be operating on behalf of a nation-state rather than a criminal group. In 2020, the Department of Justice charged several PLA officers with one of the largest breaches in history: stealing the credit ratings and records of 147 million people from Equifax.<sup>63</sup>

The PRC has been conducting space operations since 1970 when it first orbited a satellite, but its space capabilities did not gain public prominence until 2007 when the PLA conducted an anti-satellite

(ASAT) test in low Earth orbit against a defunct Chinese weather satellite. The test became one of the worst debris-generating incidents of the space age: Many of the several thousand pieces of debris that were generated will remain in orbit for more than a century.

Equally important, Chinese counter-space efforts have been expanding steadily. The PLA not only has tested ASATs against low Earth orbit systems, but also is believed to have tested a system designed to attack targets at geosynchronous orbit (GEO) approximately 22,000 miles above the Earth.<sup>64</sup> Because many vital satellites are at GEO, including communications and missile early-warning systems, China's ability to target such systems constitutes a major threat. In early 2022, China's Shijian-22 towed a dead Chinese satellite into a "graveyard" orbit above the GEO belt.<sup>65</sup> This was officially touted as a servicing operation, but the ability to attach one satellite to another and then tow it also has potential military implications.

The creation of the PLASSF, incorporating counter-space forces, reflects the movement of counter-space systems, including direct-ascent ASATs, out of the testing phase to fielding with units. In 2018, for example, the U.S. National Air and Space Intelligence Center (NASIC) noted that "China has military units that have begun training with anti-satellite missiles."<sup>66</sup>

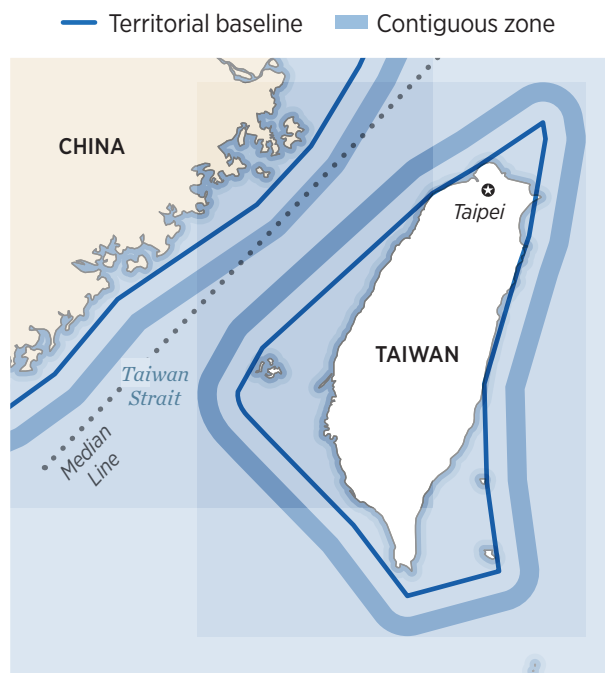
### Threat of Regional War

Three issues, all involving China, threaten American interests and embody the "general threat of regional war" noted at the outset of this section: the status of Taiwan, the escalation of maritime and territorial disputes, and border conflict with India.

**Taiwan.** China's escalating efforts to change the status quo in the Taiwan Strait constitute the greatest risk of conflict between China and the United States. China's long-standing threat to end Taiwan's de facto independence and ultimately to bring Taiwan under the authority of Beijing—by force if necessary—is also a threat both to a major American security partner and to the American interest in peace and stability in the Western Pacific.

While China's use of force against Taiwan could take a variety of forms, the possibility of an amphibious invasion has fueled speculation over when such a contingency would most likely occur. Congressman Mike Gallagher (R-WI), chairman

## Maritime Boundaries in the Taiwan Strait



**SOURCE:** “America and China Spar over the Taiwan Strait,” *The Economist*, June 23, 2022, <https://www.economist.com/china/2022/06/23/america-and-china-spar-over-the-taiwan-strait> (accessed September 8, 2023).

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of the House Select Committee on the Strategic Competition Between the United States and the Chinese Communist Party, has argued that “the U.S. military is entering into a ‘window of maximum danger,’” more commonly known as the “Davidson Window.”<sup>67</sup> This is a reference to former U.S. Indo-Pacific Command (USINDOPACOM) Commander Admiral Philip Davidson’s statement during testimony before the Senate Armed Services Committee in 2021 that China is “accelerating [its] ambitions to supplant the United States” and that “I think the threat [to Taiwan] is manifest during this decade, in fact, in the next six years.”<sup>68</sup> Separately, CIA Director William Burns has stated that Xi has instructed the PLA “to be ready by 2027 to invade Taiwan,” although he has also assessed that Xi and the PLA “have doubts today about whether they

could accomplish that invasion.”<sup>69</sup> In April 2023, USINDOPACOM Commander Admiral John Aquilino stated that everyone is still “guessing” when China will invade.<sup>70</sup>

Tensions across the Taiwan Strait have worsened as a result of Beijing’s efforts to pressure and isolate Taiwan’s democratically elected government. Beijing has suspended most direct government-to-government discussions with Taipei and is using a variety of inducements to deprive Taiwan of its remaining diplomatic partners.

Beijing has also undertaken significantly escalated military activities directed at Taiwan. For example:

- China has dramatically escalated aerial activity around Taiwan and incursions into Taiwan’s self-declared air defense identification zone, repeatedly setting records over recent years.
- In 2021, China sent more than 150 aircraft into Taiwan’s ADIZ over four days, a record at that time.<sup>71</sup>
- Total Chinese aerial incursions into Taiwan’s ADIZ increased from 380 aircraft in 2020 to 960 in 2021 and 1,727 in 2022.<sup>72</sup>
- China used U.S. House Speaker Nancy Pelosi’s August 2022 visit as a pretext to increase the quantity and provocativeness of aerial incursions around Taiwan, with a historic record of 446 aircraft entering Taiwan’s ADIZ and more than 300 of those 446 aircraft crossing the median line of the Taiwan Strait. Chinese aircraft had last crossed the median line in September 2020 with 48 aircraft involved that month.<sup>73</sup>
- China’s August 2022 military provocations also saw a peak in naval activity, with as many as 14 PLAN vessels operating around Taiwan simultaneously; the declaration of “exercise zones” surrounding Taiwan, which interfered with shipping and air traffic; and the launch of conventional ballistic missiles, long-range rockets, and short-range missiles from mainland China, some of which flew over Taiwan or landed in Japan’s Exclusive Economic Zone (EEZ)—seemingly a rehearsal for the blockade of Taiwan.<sup>74</sup>

- In April 2023, China again escalated to new historic records of military activity around Taiwan, allegedly in response to the transit of Taiwan’s President through the United States, although such routine travel stops had not drawn similar responses in the past. On the final day of these “exercises,” a dozen Chinese warships and 91 Chinese aircraft—a new record for a single day—practiced “joint shock and deterrence and island closure and control,” essentially another rehearsal for a blockade.<sup>75</sup>
- Chinese fighters, along with airborne early warning aircraft, have increased their exercises southwest of Taiwan, demonstrating a growing ability to conduct flexible air operations and reduced reliance on ground-based control,<sup>76</sup> and have undertaken sustained joint exercises to simulate extended air operations, employing both air and naval forces including aircraft carrier operations.<sup>77</sup> Such exercises have focused increasingly on denying U.S. and allied forces use of the Bashi Channel, a strategic corridor through the First Island Chain between Taiwan and the Philippines that would be essential in a Taiwan contingency.<sup>78</sup>

Chinese leaders from Deng Xiaoping and Mao Zedong to Xi Jinping have consistently emphasized the importance of ultimately reclaiming Taiwan. The island—along with Tibet—is the clearest example of a geographical “core interest” for the Chinese Communist Party, seen as essential for its claim to unchallenged rule. China has never renounced the use of force against Taiwan and continues to employ political warfare against Taiwan’s political and military leadership.

For the Chinese leadership, the failure to effect unification, whether peacefully or by using force, would reflect fundamental political weakness. CCP leaders therefore believe that they cannot back away from the stance of having to unify the island with the mainland, and the island remains an essential part of the PLA’s “new historic missions,” shaping its acquisitions and military planning.

It is widely posited that China’s A2/AD strategy—the deployment of an array of overlapping capabilities, including anti-ship ballistic missiles (ASBMs), submarines, and long-range cruise missiles, satellites, and cyber weapons—is aimed largely at forestalling American intervention in support of friends

and allies in the Western Pacific including Taiwan. By holding at risk key American platforms and systems (for example, aircraft carriers), the Chinese seek to delay or even deter American intervention, thereby allowing them to achieve a *fait accompli*. The growth of China’s military capabilities is specifically oriented toward countering America’s ability to assist in the defense of Taiwan.

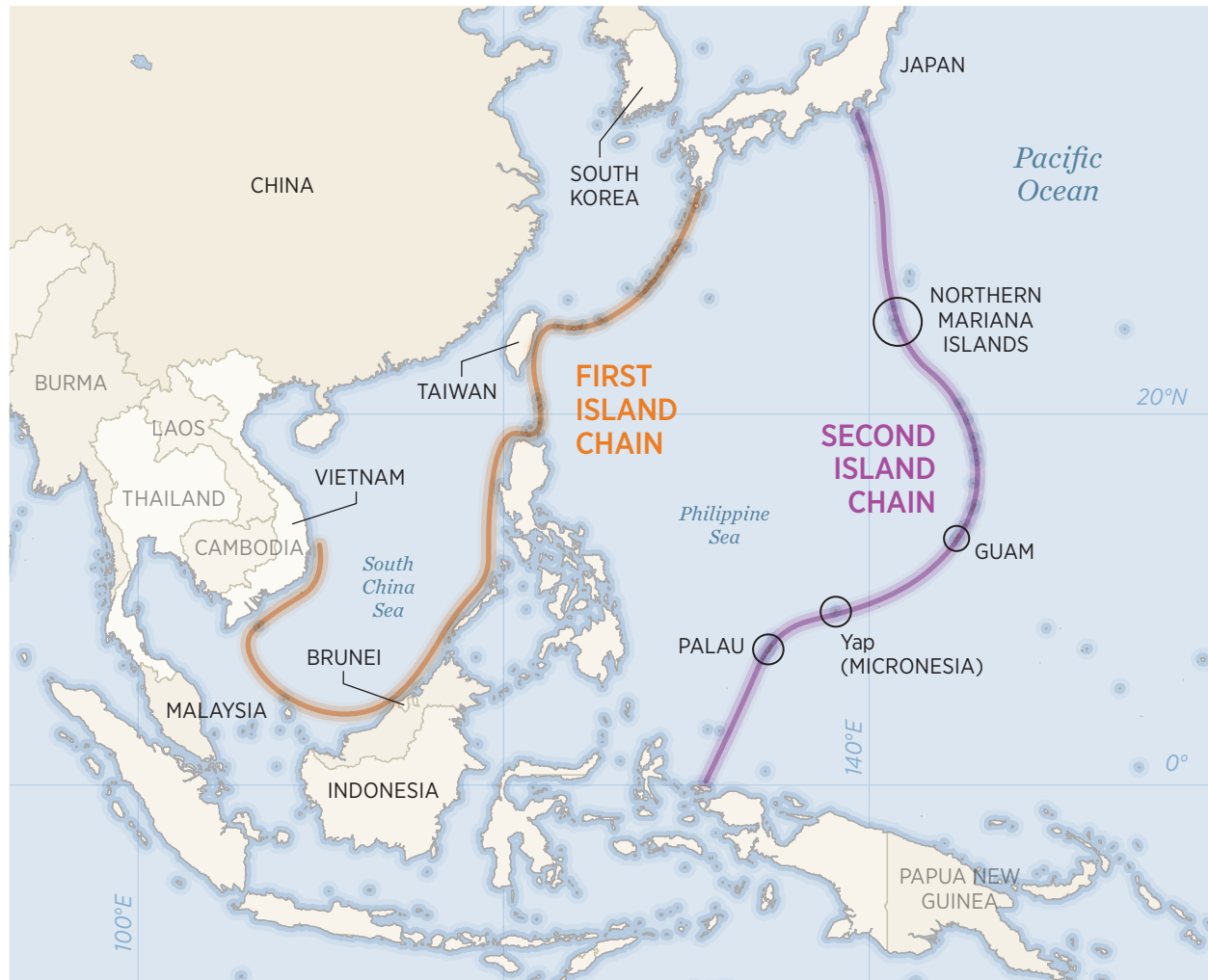
Moreover, China’s efforts to reclaim Taiwan are not limited to overt military means. The “three warfares” highlight Chinese political warfare methods, including legal warfare/lawfare, public opinion warfare, and psychological warfare. The PRC employs such approaches to undermine both Taiwan’s will to resist and America’s willingness to support Taiwan. The Chinese goal would be to “win without fighting”—to take Taiwan without firing a shot or with only minimal resistance before the United States could organize an effective response.

**Escalation of Maritime and Territorial Disputes.** The PRC and other countries in the region see active disputes over the East and South China Seas as matters of territorial sovereignty, not as differences regarding the administration of international common spaces. As a result, there exists the threat of armed conflict between China and American allies, including Japan and the Philippines, as well as nascent American security partners such as Vietnam and Indonesia.

China has escalated maritime and territorial disputes for both economic and geopolitical reasons, steadily expanding its maritime power, including its merchant marine and maritime law enforcement capabilities, and acting to secure its “near seas” as a Chinese preserve. Because its economic center of gravity is now in the coastal region, China has had to emphasize maritime power to defend key assets and areas. China increasingly depends on the seas for its economic well-being. The ability to apply pressure in disputed areas also offers China a useful geopolitical tool against rival claimant states that complements Beijing’s other means of coercion and inducement such as its Belt and Road incentives. This toolset has contributed to a lack of pushback against China’s effort to achieve hegemony in the Indo-Pacific, including from countries that are directly affected by China’s territorial aggression.

In both the East China Sea and the South China Sea, China has sought to exploit “gray zones,” gaining control incrementally and deterring others

## Two Pacific Island Chains



SOURCE: Heritage Foundation research.

 heritage.org

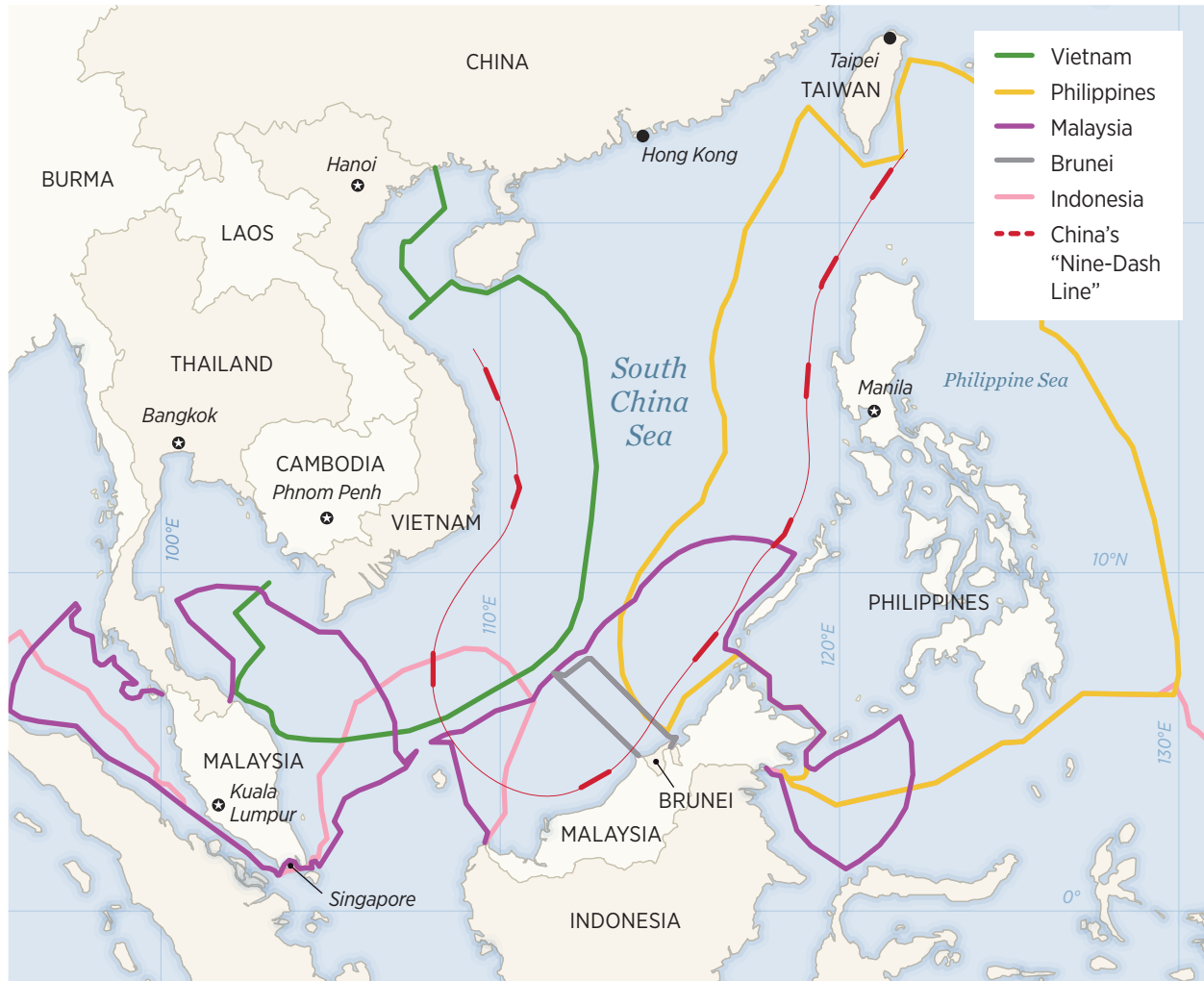
without resorting to the lethal use of force. It uses military and economic threats, bombastic language, and legal warfare (including the employment of Chinese maritime law enforcement vessels) as well as military bullying. Chinese paramilitary-implemented, military-backed encroachment in support of expansive extralegal claims could lead to an unplanned armed clash.

In the East China Sea, China has intensified its efforts to assert claims of sovereignty over the Senkaku Islands of Japan. Beijing asserts both exclusive economic rights within the disputed waters

and recognition of “historic” rights to dominate and control those areas as part of its territory.<sup>79</sup> Chinese fishing boats (often believed to be elements of the Chinese maritime militia) and Chinese Coast Guard (CCG) vessels have been encroaching steadily on the territorial waters within 12 nautical miles of the uninhabited islands, including in 13 instances in just the first five months of 2023.<sup>80</sup> China first deployed a naval unit (as opposed to the CCG) within the contiguous zone of the Senkakus between 12 and 24 miles from shore in 2016.<sup>81</sup> Meanwhile, the CCG has routinized incursions within 12 miles of



## Exclusive Economic Zone (EEZ) Claims in the South China Sea



**SOURCE:** Center for Strategic and International Studies, Asia Maritime Transparency Initiative, “Maritime Claims of the Indo-Pacific,” <https://amti.csis.org/maritime-claims-map/> (accessed September 9, 2023).

heritage.org

Senkaku features. In 2022 and 2023, the CCG set successive records for time lingering within this area: 72 hours in December 2022, and more than 80 hours in April 2023.<sup>82</sup>

In 2013, Beijing unilaterally declared an ADIZ over the East China Sea.<sup>83</sup> Part of a broader pattern of using intimidation and coercion to assert expansive extralegal claims of sovereignty and/or control, China has gone on to use the ADIZ as a pretext for attempts to restrict lawful air travel over the East China Sea. For example:

- In June 2016, a Chinese fighter made an “unsafe” pass near a U.S. Air Force RC-135 reconnaissance aircraft in the East China Sea area.
- In March 2017, Chinese authorities warned the crew of an American B-1B bomber operating in the area of the ADIZ that they were flying illegally in PRC airspace, and the Chinese Foreign Ministry “urged the U.S. and other countries to respect its declared airspace.”<sup>84</sup>

- In May 2018, the Chinese intercepted a U.S. Air Force WC-135, also over the East China Sea.<sup>85</sup>
- From late 2017 through 2018, Chinese vessels targeted U.S. aircraft with “blinding laser attacks” more than 20 times according to media reports citing U.S. Indo-Pacific Command.<sup>86</sup>
- In June 2022, a Chinese fighter jet released chaff and flares into the engines of an Australian plane.<sup>87</sup>
- On December 21, 2022, a PLAN J-11 fighter pilot performed an unsafe maneuver while intercepting another U.S. Air Force RC-135, coming within 20 feet of the RC-135’s nose and forcing it to engage in evasive maneuvers.<sup>88</sup>
- On February 6, 2023, China used a laser device to blind the crew of a Philippine Coast Guard ship.<sup>89</sup>
- On May 26, 2023, a PRC J-16 fighter pilot performed an aggressive maneuver while intercepting a U.S. Air Force RC-135 aircraft. The RC-135 was forced to fly through its jet wake after the J-16 flew “directly in front of the [RC-135’s] nose.”<sup>90</sup>

China has asserted an illegal territorial claim to virtually the entire South China Sea, which overlaps with Bruneian, Philippine, Malaysian, Vietnamese, Indonesian, and Taiwanese claims.<sup>91</sup> Various of the South China Sea claimant states’ proposed boundaries overlap, and this has generated long-standing political and diplomatic disagreements, but China’s actions to advance its territorial ambitions and restrict other claimants’ use of the area are unparalleled and have repeatedly resulted in confrontation.

The most significant development in the South China Sea since Xi Jinping assumed leadership of the Chinese Communist Party has been China’s reclamation and militarization of seven artificial islands or outposts. In 2015, Xi promised President Obama that China had no intention of militarizing the islands. That pledge has never been honored.<sup>92</sup>

According to the DOD’s 2021 annual report on the Chinese military, “[n]o substantial land has been reclaimed at any of the outposts since the PRC completed its extensive artificial manipulation in

the Spratly Islands in late 2015, after adding more than 3,200 acres of land to the seven features it occupies in the Spratlys.”<sup>93</sup> This could be taken to suggest that the process has been completed. In fact, as described by Admiral Aquilino in his March 2022 posture statement to the Senate Committee on Armed Services:

[T]he PLA has deployed anti-ship cruise missiles, surface-to-air missiles, and jamming equipment to its artificial Spratly Islands features since 2018 and flown aircraft from those locations since 2020. The PLA has emplaced expansive military infrastructure in the SCS by building aircraft hangars sufficient to accommodate multiple fighter brigades, protective shelters for surface-to-air and anti-ship missiles, and significant fuel storage facilities.<sup>94</sup>

The DOD’s 2022 report on the Chinese military reflects that:

- The “advanced anti-ship and anti-aircraft missile systems and military jamming equipment” on these islands are “the most capable land-based weapons systems deployed by any claimant in the disputed South China Sea to date”;
- “From early 2018 through 2021, the PRC regularly utilized its Spratly Islands outposts to support naval and coast guard operations in the South China Sea”; and
- “In mid-2021, the PLA deployed an intelligence-gathering ship and a surveillance aircraft to the Spratly Islands during U.S.–Australia bilateral operations in the region.”<sup>95</sup>

In November 2022, the Chinese coast guard deployed an inflatable boat to cut the tow line of and retrieve debris from a Chinese rocket launch that a Philippine boat was towing.<sup>96</sup> Most recent examples include the aforementioned blinding of a Philippine coast guard vessel and interception of an U.S. Air Force aircraft in the South China Sea.

China–Vietnam tensions have flared sporadically in the South China Sea in recent years. In 2020, CCG vessels rammed and sank Vietnamese fishing boats twice near the disputed Paracel Islands.<sup>97</sup> More recently, Chinese vessels have interfered

## Chinese Fault Lines



**China-India Border.** The Line of Actual Control represents one of the world's longest disputed borders and has been the site of several standoffs between the Chinese and Indian militaries in recent years, including a border crisis in 2020 that resulted in the first casualties from hostilities at the border in more than 40 years.

**East China Sea.** China claims the disputed Senkaku/Diaoyu Islands, which are currently administered by Japan. In recent

years, Chinese aircraft and naval vessels have entered the airspace and territorial sea around the islands with growing frequency.

**Taiwan.** The sovereignty of Taiwan remains unsettled. The People's Republic of China disputes this status and regularly conducts provocative military maneuvers near Taiwan.

**South China Sea.** The South China Sea hosts several territorial disputes between China and

Taiwan and its Southeast Asian neighbors. China's unlawful claims in the sea and attempts to restrict freedom of navigation there have also produced tensions with the U.S., which has sent aircraft and naval vessels through the South China Sea to signal its objections to the nature of China's claims. This has resulted in a number of confrontations between Chinese and U.S. vessels.

**SOURCE:** Heritage Foundation research.

 heritage.org

repeatedly with Vietnamese energy exploration blocks. One instance in May 2023 involved a 14-vessel fleet of CCG and paramilitary ships.<sup>98</sup> Vietnam has also protested China's decision to create additional administrative regions for the South China Sea, one centered on the Paracels and the other centered on the Spratlys.<sup>99</sup> This is part of Beijing's "legal warfare" efforts, which employ legal and administrative measures to underscore China's claimed control of the South China Sea region. For this reason, conflict often occurs around Chinese enforcement of unilaterally determined and announced fishing bans.<sup>100</sup>

Given that the United States shares a defense alliance with the Philippines, tensions between Beijing and Manila are the most likely to prompt American involvement in these disputes. There have been several volatile incidents between the two parties since the 1990s. The most contentious occurred in 2012 when a Philippine naval ship operating on behalf of the country's coast guard challenged private Chinese poachers in waters around Scarborough Shoal. The resulting escalation left Chinese government ships in control of the shoal after the U.S. helped to broker an agreement by which both sides agreed to withdraw from the standoff site. The Philippines complied; China did not.

Following the Scarborough Shoal crisis, the Philippines successfully challenged Beijing in the Permanent Court of Arbitration regarding its rights under the U.N. Convention on the Law of the Sea (UNCLOS). The tribunal found that many of China's claims in the South China Sea were unlawful. China has nevertheless ignored the ruling, and the ongoing presence of the Chinese Coast Guard around Scarborough Shoal remains a source of tension.<sup>101</sup>

In March and April 2021, a similar dispute arose around Whitsun Reef in the Spratlys. The presence of more than 200 Chinese fishing boats, among them known assets of China's maritime militia,<sup>102</sup> sparked protests from Manila. After a stay of a few weeks, which Beijing claimed was necessary because of the poor weather, most of the ships departed. The unprecedented gathering of fishing boats and maritime militia could be yet another attempt to establish a more permanent presence in the Philippines' EEZ.

The Philippines began to publicize instances of Chinese aggression at sea in 2023. In February, the Philippines condemned the CCG for "dangerous

maneuvers and the use of a military-grade laser on members of the Philippine Coast Guard," who were "undertaking a mission in support of the regular rotation and resupply mission for the BRP Sierra Madre in Ayungin [Second Thomas] Shoal, the Philippines' permanent presence on the feature."<sup>103</sup> The Philippine Coast Guard released photo evidence of the laser incident, which reportedly temporarily blinded Philippine crewmen. In all of these cases, tensions have been exacerbated by rising Chinese nationalism.

In the event of armed conflict between China and the Philippines or between China and Japan, either by design or as the result of an accidental incident at sea, the U.S. could be required to exercise its treaty commitments.<sup>104</sup> In recent years the U.S. government has clarified that its treaty obligations to Japan and the Philippines extend to disputed territories claimed by China. The risk of an incident escalating and involving the U.S. is a growing threat, particularly in the East and South China Seas, where naval as well as civilian law enforcement vessels from both China and the U.S. operate in what the U.S. considers to be international waters. If China ultimately tries to assert its authority by declaring an ADIZ over the entire South China Sea as some have speculated it might, its action could further increase tensions.<sup>105</sup>

**Border Conflict with India.** The possibility of armed conflict between India and China, while currently remote, poses an indirect threat to U.S. interests because it could disrupt the territorial status quo and raise nuclear tensions in the region. A border conflict between India and China could also prompt Pakistan to add to regional instability by trying to take advantage of the situation.

Long-standing border disputes that led to a Sino-Indian war in 1962 have again become a flashpoint in recent years. In April 2013, the most serious border incident between India and China in more than two decades occurred when Chinese troops settled for three weeks several miles inside northern Indian territory on the Depsang Plains in Ladakh. A visit to India by Chinese President Xi Jinping in September 2014 was overshadowed by another flare-up in border tensions when hundreds of Chinese PLA forces reportedly set up camps in the mountainous regions of Ladakh, prompting Indian forces to deploy to forward positions in the region. This border standoff lasted three weeks until both sides agreed to pull their troops back to previous positions.

## Disputed Borders Between India and China



**Western Sector.** Aksai Chin, a barren plateau that was part of the former princely state of Jammu and Kashmir, has been administered by the Chinese since they seized control of the territory in the 1962 Sino-Indian border conflict. One of the main causes of that war was India's discovery of a road China had built through the region, which India considered its territory.

**Middle Sector.** The Middle Sector, where the Indian states of Uttarakhand and Himachal Pradesh meet the Tibet Autonomous Region, is the least contentious of the three main disputed "sectors," with the least amount of territory contested. It is also the only sector for which the Chinese and Indian governments have formally exchanged maps delineating their respective claims.

**Eastern Sector.** China claims nearly the entire Indian state of Arunachal Pradesh, which Beijing calls South Tibet. The McMahon Line, which has served as the de facto Line of Actual Control since 1962, was established in 1914 by the British and Tibetan representatives and is not recognized by China. The U.S. recognizes Arunachal Pradesh as sovereign Indian territory.

**SOURCE:** Heritage Foundation research.

 heritage.org

In 2017, Chinese military engineers were building a road to the Doklam plateau, an area claimed by both Bhutan and China, and this led to a confrontation between Chinese and Indian forces, the latter requested by Bhutanese authorities to provide assistance. The crisis lasted 73 days. Both sides pledged

to pull back, but Chinese construction efforts in the area have continued.<sup>106</sup> Improved Chinese infrastructure not only would give Beijing the diplomatic advantage over Bhutan, but also could make the Siliguri corridor that links the eastern Indian states with the rest of the country more vulnerable.

In June 2020, the situation escalated even further. Clashes between Indian and Chinese troops using rocks, clubs, and fists led to at least 20 Indian dead and (as the Chinese authorities later admitted) at least four Chinese killed in the Galwan Valley area of Ladakh.<sup>107</sup> In the years since then, dozens of rounds of negotiations between China and India have resulted in at least partial de-escalation and pullback from several standoff sites in Ladakh. However, both sides maintain elevated forward-deployed forces all along the Line of Actual Control in Ladakh, and at two sites there has been no de-escalation agreement. India claims it is engaged in the largest peacetime military deployment to one of its borders in its modern history.<sup>108</sup>

India also claims that China occupies more than 14,000 square miles of Indian territory in the Aksai Chin along its northern border in Kashmir, and China lays claim to more than 50,000 square miles of India's northeastern state of Arunachal Pradesh. The latter dispute is closely related to China's ongoing efforts to control Tibetan Buddhism and the presence in India of the Tibetan government in exile and spiritual leader of Buddhists worldwide, the Dalai Lama.

### Threats to the Commons

Critical U.S. sea, air, space, and cyber interests are at stake in the international commons. These interests include an economic interest in the free flow of commerce and the military use of the commons to safeguard America's own security and contribute to the security of its allies and partners.

Washington has long underwritten the security of the Indo-Pacific's common areas, and this in turn has supported the region's remarkable economic development. However, China is taking increasingly aggressive steps—including the construction of islands atop previously submerged features—to advance its own interests and is pursuing expanded military access and basing globally. Two things are clear: China and the United States do not share a common conception of international space and China is actively seeking to undermine American predominance in securing international common spaces.

**Dangerous Behavior in Maritime and Air-space Common Spaces.** The aggressiveness of the Chinese navy, maritime law enforcement forces, and air forces in and over the waters of the East China Sea, South China Sea, and Taiwan Strait, coupled

with ambiguous, extralegal territorial claims and assertion of control in these areas, poses an incipient threat to American and overlapping allied interests. Chinese military writings emphasize the importance of establishing dominance of the air and maritime domains in any future conflict.

Although the Chinese may not yet have sufficient capacity to prevent the U.S. from operating in local waters and airspace, the ability of the U.S. to operate within the First Island Chain at acceptable costs in the early stages of a conflict has become a matter of greater debate.<sup>109</sup> A significant factor in this calculus is the fact that China has “fully militarized at least three of several islands it built in the disputed South China Sea, arming them with anti-ship and anti-aircraft missile systems, laser and jamming equipment and fighter jets in an increasingly aggressive move that threatens all nations operating nearby.”<sup>110</sup> China also has been intensifying its challenges to long-standing rivals Vietnam and the Philippines and has begun to push toward Indonesia's Natuna Islands and into waters claimed by Malaysia.

It is unclear whether China is yet in a position to enforce an air defense identification zone (ADIZ) consistently, but the steady two-decade improvement of the PLAAF and PLAN naval aviation will eventually yield the necessary capabilities. Chinese observations of recent conflicts, including wars in the Persian Gulf, the Balkans, Afghanistan, and now Russia's war against Ukraine, have emphasized the growing role of airpower and missiles in conducting “non-contact, non-linear, non-symmetrical” warfare.<sup>111</sup> This growing parity, if not superiority, constitutes a radical shift from the Cold War era when the U.S. and its allies clearly would have dominated air and naval operations in the Pacific.

China also has begun to employ nontraditional methods of challenging foreign military operations in what Beijing regards as its territorial waters and airspace. It has employed lasers, for example, against foreign air and naval platforms, endangering pilots and sailors by threatening to blind them.<sup>112</sup>

Chinese military aircraft have increasingly performed dangerous intercepts of American and allied aircraft in international airspace, especially since 2022.

- In June 2022, a Chinese fighter jet released chaff and flares into the engines of an Australian plane.<sup>113</sup>

- On June 3, 2022, in the Taiwan Strait, China further escalated its aggressive conduct when the “PLAN LUYANG III DG 132 (PRC LY 132) executed maneuvers in an unsafe manner” by crossing the USS *Chung-Hoon*’s bow twice, “violat[ing] maritime ‘Rules of the Road,’ of safe passage in international waters” and forcing the *Chung-Hoon* to slow “to avoid a collision.”<sup>114</sup>
- On December 21, 2022, a PLAN J-11 fighter pilot performed a similarly unsafe maneuver while intercepting another U.S. Air Force RC-135, coming within 20 feet of the plane’s nose and “forcing the RC-135 to take evasive maneuvers to avoid a collision.”<sup>115</sup>
- Most recently, on May 26, 2023, a PRC J-16 fighter pilot performed “an unnecessarily aggressive maneuver” while intercepting a U.S. Air Force RC-135 aircraft, flying “directly in front of the nose of the RC-135” and “forcing the U.S. aircraft to fly through its wake turbulence.”<sup>116</sup>

**Expanding Global Military Footprint.** As China expands its naval capabilities, it will be present farther and farther away from its home shores. In 2017, as part of this effort, it established its first formal overseas military base pursuant to an agreement with the government of Djibouti. In the years since then, China’s overseas military infrastructure has continued to expand. China has laid the groundwork for a second, undeclared military base in Cambodia, is in the process of creating logistics facilities and other military construction around the world, and controls a number of dual-use commercial facilities that could support power projection in future contingencies. The U.S. Intelligence Community reportedly has concluded that China plans to “build a global military network that includes at least five overseas bases and 10 logistical support sites by 2030.”<sup>117</sup>

In 2019, China and Cambodia reportedly signed a secret agreement providing for the PLA’s use of Cambodia’s Ream Naval Base.<sup>118</sup> While officials from both countries publicly deny plans for a Chinese base,<sup>119</sup> governments and public reportage have confirmed that work continues toward a significant PLA presence at Ream.<sup>120</sup> The 2022 DOD report on Chinese capabilities reflects that “[t]he PRC’s

military facility at Ream Naval Base in Cambodia will be the first PRC overseas base in the Indo-Pacific.”<sup>121</sup> Since June 2022, China has financed significant development of Ream, including multiple new piers and buildings, dredging of the harbor to support larger ships, and site development for further construction.<sup>122</sup> The U.S. Treasury Department has sanctioned Chinese state-owned Union Development Group, among other reasons, for the potential militarization of nearby Dara Sakor airport.<sup>123</sup>

China is also pursuing or already operating additional facilities abroad for explicit military purposes. Chinese paramilitary units have operated from a base near the Afghan border in Tajikistan since at least 2016,<sup>124</sup> and the Tajik government reportedly has offered to transfer ownership of the facility to China in return for further military construction and aid.<sup>125</sup> As part of an effort to secure a military presence in the Atlantic, China has made inroads through the potential development of a naval facility in Equatorial Guinea<sup>126</sup> and a purported joint training facility with Gabon.<sup>127</sup> According to the Defense Department’s 2022 report on Chinese capabilities, China “has likely considered Myanmar [Burma], Thailand, Singapore, Indonesia, Pakistan, Sri Lanka, United Arab Emirates, Kenya, Equatorial Guinea, Seychelles, Tanzania, Angola, and Tajikistan among other places as locations for PLA military logistics facilities.”<sup>128</sup>

China is also leveraging its extensive network of commercial ports developed under Xi Jinping’s Belt and Road Initiative (BRI), both for present overseas military operations and for potential future basing. Chinese firms, overwhelmingly state-owned, have participated in the development of at least 200 ports globally and have an ownership or operating interest in 95 ports.<sup>129</sup> According to the DOD:

Currently, the PRC uses commercial infrastructure to support all of its military operations abroad, including the PLA’s presence in other countries’ territories, such as at its base in Djibouti. Some of the PRC’s BRI projects could create potential military advantages, such as PLA access to selected foreign ports to pre-position the necessary logistics support to sustain naval deployments in waters as distant as the Indian Ocean, Mediterranean Sea, and Atlantic Ocean to protect its growing interests.<sup>130</sup>

In Sri Lanka, for example, Chinese military vessels have visited Chinese-developed commercial ports in both Colombo and Hambantota in recent years. U.S. intelligence agencies believe that since 2021, China has been building an undisclosed military facility in Abu Dhabi's Khalifa port, where Chinese state-owned shipping giant Cosco operates a terminal.<sup>131</sup>

**Increased Military Space Activity.** One of the key force multipliers for the United States is its extensive array of space-based assets. Through its various satellite constellations, the U.S. military can track opponents, coordinate friendly forces, engage in precision strikes against enemy forces, and conduct battle-damage assessments so that its munitions are expended efficiently.

Because the American military is expeditionary—meaning that its wars are fought far from the homeland—its reliance on space-based systems is greater than that of many other militaries. Consequently, it requires global rather than regional reconnaissance, communications and data transmission, and meteorological information and support. At this point, only space-based systems can provide this sort of information on a real-time basis. No other country is capable of leveraging space as the U.S. does, and that is a major advantage. However, this heavy reliance on space systems is also a key American vulnerability.

China aims to be “a broad-based, fully capable space power” and is “second only to the U.S. in the number of operational satellites.”<sup>132</sup> It fields an array of space capabilities, including its own BeiDou/Compass system of navigation and timing satellites, and has claimed a capacity to refuel satellites.<sup>133</sup> Additional investments have focused on “intelligence, surveillance, and reconnaissance (ISR), satellite communication, satellite navigation, and meteorology, as well as human spaceflight and robotic space exploration.”<sup>134</sup> It has four satellite launch centers. China's interest in space dominance includes both accessing space and denying opponents the ability to do the same. As one Chinese assessment notes, space capabilities “provided 70 percent of battlefield communications, more than 80 percent of battlefield reconnaissance and surveillance, and 100 percent of meteorological data” for American operations in Kosovo, and “98 percent of precision-guided weapons were guided with space-based information.”<sup>135</sup> In fact, “[i]t may be said that America's

victory in the Kosovo War could not [have been] achieved without fully exploiting space.”<sup>136</sup>

To this end, the PLA has been developing a range of anti-satellite capabilities that include both hard-kill and soft-kill systems. The former include direct-ascent kinetic-kill vehicles (DA-KKV) such as the system famously tested in 2007, but they also include more advanced systems that are believed to be capable of reaching targets in mid-Earth orbit and even geosynchronous orbit.<sup>137</sup> The latter include anti-satellite lasers for either dazzling or blinding purposes.<sup>138</sup> This is consistent with PLA doctrinal writings, which emphasize the need to control space in future conflicts. “Securing space dominance has already become the prerequisite for establishing information, air, and maritime dominance,” says one Chinese teaching manual, “and will directly affect the course and outcome of wars.”<sup>139</sup>

Orbital threats are growing as well. The Shijian-17 satellite has a robotic arm that can physically redirect satellites. In January 2022, the Shijian-21 “moved a derelict BeiDou navigation satellite to a high graveyard orbit above GEO.”<sup>140</sup>

It should also be noted that soft-kill attacks need not come only from dedicated weapons. The case of Galaxy-15, a communications satellite owned by Intelsat Corporation, showed how a satellite could disrupt communications simply by always being in “switched on” mode.<sup>141</sup> Before it was finally brought under control, it had drifted through a portion of the geosynchronous belt, forcing other satellite owners to move their assets and juggle frequencies. A deliberate such attempt by China (or any other country) could prove far harder to handle, especially if conducted in conjunction with attacks by kinetic systems or directed-energy weapons.

Most recently, China has landed an unmanned probe at the lunar south pole on the far side of the Moon. This is a major accomplishment because the probe is the first spacecraft ever to land at either of the Moon's poles. To support this mission, the Chinese deployed a data relay satellite to Lagrange Point-2, one of five points where the gravity wells of the Earth and Sun “cancel out” each other, allowing a satellite to remain in a relatively fixed location with minimal fuel consumption. While the satellite itself may or may not have military roles, the deployment highlights that China will now be using the enormous volume of cis-lunar space (the region between the Earth and the Moon) for various



deployments. This will greatly complicate American space situational awareness efforts by forcing the U.S. to monitor a vastly greater area of space for possible Chinese spacecraft. The Chang'e-5 lunar sample retrieval mission in 2020 and China's recent landing on Mars underscore the PRC's effort to move beyond Earth orbit to cis-lunar and interplanetary space.

**Cyber Activities and the Electromagnetic Domain.** As far back as 2013, the Verizon Risk Center identified China as the “top external actor from which [computer] breaches emanated, representing 30 percent of cases where country-of-origin could be determined.”<sup>142</sup> Given the difficulties of attribution, country of origin should not necessarily be conflated with perpetrator, but forensic efforts have associated at least one Chinese military unit with cyber intrusions, albeit many years ago.<sup>143</sup> The Verizon report similarly concluded that China was the source of 95 percent of state-sponsored cyber espionage attacks.

Since the 2015 summit meeting between Chinese President Xi Jinping and U.S. President Barack Obama, during which the two sides reached an understanding to reduce cyber economic espionage, Chinese cyber actions have shifted. Although the overall level of activity appears to be unabated, the Chinese seem to have moved toward more focused attacks mounted from new sites.

China's cyber espionage efforts are often aimed at economic targets, reflecting China's much more holistic view of both security and information. Rather than creating an artificial dividing line between military security and civilian security, much less information, the PLA plays a role in supporting both aspects and seeks to obtain economic intellectual property as well as military electronic information.

This is not to suggest that the PLA has not emphasized the military importance of cyber warfare. Chinese military writings since the 1990s have emphasized a fundamental transformation in global military affairs. Future wars will be conducted through joint operations involving multiple services, not through combined operations focused on multiple branches within a single service, and will span outer space and cyberspace in addition to the traditional land, sea, and air domains. Outer space and cyberspace will be of special importance because the introduction of information technology into all

areas of military operations has caused the goal of warfare to move beyond establishing material dominance (characteristic of industrial-age warfare) to include establishing information dominance.

Consequently, according to PLA analysis, future wars will most likely be “informationized local wars.” That is, they will be wars in which information and information technology will be both widely applied and a key basis of victory. The ability to gather, transmit, analyze, manage, and exploit information will be central to winning such wars: The side that is able to do these things more accurately and more quickly will be the side that wins. This means that future conflicts will no longer be determined by platform-versus-platform performance and not even by system against system: Conflicts are now clashes between rival systems of systems.<sup>144</sup>

Chinese military writings suggest that a great deal of attention has been focused on developing an integrated computer network and electronic warfare (INEW) capability. This would allow the PLA to reconnoiter a potential adversary's computer systems in peacetime, influence opponent decision-makers by threatening those same systems in times of crisis, and disrupt or destroy information networks and systems by cyber and electronic warfare means in the event of conflict. INEW capabilities would complement psychological warfare and physical attack efforts to secure “information dominance,” which Chinese military writings emphasize as essential for fighting and winning future wars.

It is essential to recognize, however, that the PLA views computer network operations as part of information operations, or information combat. Information operations are specific operational activities that are associated with striving to establish information dominance. They are conducted in both peacetime and wartime with the peacetime focus on collecting information, improving its flow and application, influencing opposing decision-making, and effecting information deterrence.

Information operations involve four mission areas:

- **Command and Control Missions.** The ability of commanders to control joint operations by disparate forces is essential to the success of information operations. Command, control, communications, computers, intelligence, surveillance, and reconnaissance structures

therefore constitute a key part of information operations by providing the means for collecting, transmitting, and managing information.

- **Offensive Information Missions.** These are intended to disrupt the enemy’s battlefield command and control systems and communications networks as well as to strike the enemy’s psychological defenses.
- **Defensive Information Missions.** Such missions are aimed at ensuring the survival and continued operation of information systems. They include deterring an opponent from attacking one’s own information systems, concealing information, and combating attacks when they do occur.
- **Information Support and Information-Safeguarding Missions.** The ability to provide the myriad types of information necessary to support extensive joint operations and to do so on a continuous basis is essential to their success.<sup>145</sup>

Computer network operations are integral to all four of these overall mission areas. They can include both strategic and battlefield network operations and can incorporate both offensive and defensive measures. They also include protection not only of data, but also of information hardware and operating software.

Finally, computer network operations will not stand alone; they will be integrated with electronic warfare operations as reflected in the phrase “network and electronics unified.” Electronic warfare operations are aimed at weakening or destroying enemy electronic facilities and systems while defending one’s own.<sup>146</sup> Techniques include jamming

and anti-jamming technologies that deny space-based communications, radar systems, and GPS navigation.<sup>147</sup> The combination of electronic and computer network attacks will produce synergies that affect everything from finding and assessing the adversary to locating one’s own forces, weapons guidance, logistical support, and command and control. The creation of the PLASSF is intended to integrate these forces and make them more complementary and effective in future “local wars under informationized conditions.”

### Conclusion

China presents the United States with its most comprehensive and daunting national security challenge across all three areas of vital American national interests: the homeland; regional war (including potential attacks on overseas U.S. bases as well as against allies and partners); and international common spaces. China is challenging the U.S. and its allies at sea, in the air, and in cyberspace. It has sparked deadly confrontations on its border with India and poses a standing and escalating threat to Taiwan.

The Chinese military is no longer a distant competitor for the U.S. China has begun to field indigenous aircraft carriers and advanced missile technology. It is rapidly expanding its nuclear arsenal and conducting live-fire exercises and mock blockades around Taiwan. If current trends persist, the gap between the Chinese and U.S. militaries is likely to narrow further, and the possibility that China might surpass U.S. capabilities in some fields is no longer implausible.

This *Index* assesses the overall threat from China, considering the range of contingencies, as “aggressive” for level of provocative behavior and “formidable” for level of capability.

## Threats: China

|            |            |            |         |              |          |
|------------|------------|------------|---------|--------------|----------|
|            | HOSTILE    | AGGRESSIVE | TESTING | ASSERTIVE    | BENIGN   |
| Behavior   |            | ✓          |         |              |          |
|            | FORMIDABLE | GATHERING  | CAPABLE | ASPIRATIONAL | MARGINAL |
| Capability | ✓          |            |         |              |          |

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# Russia

## The Heritage Defense Team

**O**n February 24, 2022, Russia launched its second invasion of Ukraine. Employing a force of nearly 200,000 troops replete with armor, rocket and conventional artillery, and combat aircraft, President Vladimir Putin ordered a “special military operation” to seize Ukraine, destabilize if not overthrow its government, and neutralize its military. Contrary to the expectations of many, however, Russia failed to win a quick victory and is now mired in an ongoing war with no prospect of complete victory. In addition to the tremendous losses borne by both sides, the war has depleted the military inventories of Western countries that continue to provide material support to Ukraine.

The assault on Ukraine is irrefutable proof that Putin’s Russia is a profound threat to the U.S., its interests, and the security and economic interests of its allies, particularly in Europe but also more broadly given the reach of Russia’s military and the destructive ripple effect its use is having across countries and regions of special importance to the United States. Today, Ukraine is in ruins, the war continues (thus illustrating the expanse of Russia’s military inventory), and Putin’s anger with Europe has intensified because Europe’s aid to Ukraine has prevented a Russian victory.

From the Arctic to the Baltics, Ukraine, and the South Caucasus, and increasingly in the Mediterranean, Russia continues to foment instability in Europe. Despite its economic problems and its losses in Ukraine, Russia continues to prioritize its military and funding for its military operations abroad. Russia remains antagonistic to the United States both militarily and politically, and its efforts to undermine U.S. institutions and the NATO alliance continue unabated.

Destruction of the Nordstream 1 and 2 pipelines and Europe’s transition away from Russian energy

sources have seriously degraded Russia’s energy position in Europe. Nevertheless, Russia continues to use energy along with espionage, cyberattacks, and information warfare to exploit vulnerabilities in an effort to divide the transatlantic alliance and undermine faith in government and societal institutions. Russia’s losses in energy sales to Europe have been mitigated by higher prices for energy in general throughout 2023 and increases in sales to non-European countries including India and China.

Overall, Russia possesses significant conventional and nuclear capabilities and remains the principal conventional threat to European security. Its aggressive stance in theaters from Ukraine and Georgia to the Balkans and Syria continues to encourage destabilization and threaten U.S. interests.

**Military Capabilities.** Assessing the state of Russia’s conventional military capabilities is unusually challenging because of the war in Ukraine, Russian efforts to mobilize additional manpower, and Russia’s efforts to bring armaments formerly in storage into frontline service. According to the International Institute for Strategic Studies (IISS):

- Among the key weapons in Russia’s inventory are 339 intercontinental ballistic missiles (ICBMs); 1,800 main battle tanks; 4,150 armored infantry fighting vehicles; more than 5,350 armored personnel carriers; and more than 4,458 pieces of artillery.
- The navy has one aircraft carrier (undergoing extensive refit); 51 submarines (including 11 ballistic missile submarines); three cruisers; 11 destroyers; 16 frigates; and 128 patrol and coastal combatants.

- The air force has 1,153 combat-capable aircraft.
- The army has approximately 550,000 soldiers, including 100,000 conscripts.
- There is a total reserve force of 1,500,000 for all armed forces.<sup>1</sup>

Russia's failure to take Kyiv in the early stages of its second invasion led to significant losses among its best forces. For example, casualty rates among some Russian Spetsnaz units reportedly have reached 90 percent–95 percent.<sup>2</sup> Russia also has suffered significant losses of tanks and other military hardware as a result of its assault on Ukraine but can be expected to rebuild its military and replace the destroyed tanks and other equipment with newly developed modern versions, not the old Soviet hardware. According to one recent analysis:

The Russian military has recognized its subpar performance and in January Chief of the General Staff Valery Gerasimov responded with another round of reforms. Under his new plan, an army corps will be added in Karelia, on Finland's border, to counter the country's entry into NATO. The Gerasimov reforms will also see the re-establishment of two military districts—Moscow and St. Petersburg—which were merged in 2010 to become part of the Western Military District. Gerasimov also said Russia would add three motorized rifle divisions in Ukraine as part of combined arms formations in the occupied Kherson and Zaporizhzhia regions.<sup>3</sup>

In recent years, Russia has increasingly deployed paid private volunteer troops trained at Special Forces bases and often under the command of Russian Special Forces in order to avoid political blowback from military deaths abroad. It has used such volunteers in Libya, Syria, and Ukraine because they help the Kremlin to “keep costs low and maintain a degree of deniability,” and “[a]ny personnel losses [can] be shrouded from unauthorized disclosure.”<sup>4</sup> The most infamous such mercenary unit, the Wagner Group, now numbers as many as 50,000 fighters, but 80 percent (40,000) of its forces used in Ukraine are reportedly drawn from prisons, and they have taken heavy casualties.<sup>5</sup>

In July 2016, Putin signed a law creating a National Guard (Rosgvardia) with a total strength, both civilian and military, of 340,000 controlled directly by him.<sup>6</sup> He created this force, which is purportedly responsible for “enforcing emergency-situation regimes, combating terrorism, defending Russian territory, and protecting state facilities and assets,” by amalgamating “interior troops and various law-enforcement agencies.”<sup>7</sup>

Rosgvardia has been involved in the war in Ukraine. In March 2022, Rosgvardia Director Viktor Zolotov stated that “National Guard units are not only involved in the fight against [the so-called Ukrainian] nationalists, [but] also fight to ensure public order and security in liberated localities, guard important strategic facilities, [and] protect humanitarian aid convoys.” Specifically, Rosgvardia was sent to seize control of various Ukrainian cities.<sup>8</sup> Putin's signature on a March 27, 2023, decree removing the upper age limit for National Guard members serving in parts of Ukraine is a telling indicator of heavy Russian casualties and the unreliability of some Guard units.<sup>9</sup>

The Russian economy rebounded during the latter part of the COVID-19 pandemic,<sup>10</sup> but after Moscow invaded Ukraine again in February 2022, Western sanctions had a significant effect on the economy.<sup>11</sup> A surge in energy prices helped to cushion the Russian economy from the worst effects of the sanctions, but the World Bank expects the Russian economy to have contracted by 4.5 percent in 2022 and to continue contracting in 2023 with inflation remaining high. The long-term outlook for Russia's economy is bleak, as restrictions on the import of Western technology hamper productivity growth.<sup>12</sup> The economic recession could affect Russia's ability to fund its military operations and will make the long-run choice between guns and butter increasingly stark. Nevertheless, it would be unwise to underrate Russia's ability to find ways to continue to sustain and rebuild its military power, even if by ever more hand-to-mouth methods.

In 2022, Russia spent \$86.4 billion on its military—9.2 percent more than it spent in 2020–2021—and remained one of the world's top five nations in terms of defense spending.<sup>13</sup> Much of Russia's military expenditure has purportedly been directed toward modernization of its armed forces, but their poor performance in Ukraine indicates that at least some of this expenditure was wasted, stolen,

or poorly used. The U.S. Intelligence Community notes that Russia “retains the ability to deploy naval, long-range bomber, and small general purpose air and ground forces globally” but that heavy losses in Ukraine “and the large-scale expenditures of precision-guided munitions during the conflict have degraded Moscow’s ground and air-based conventional capabilities and increased its reliance on nuclear weapons.”<sup>14</sup>

From 2010 to 2019 (the most recent year for which data are publicly available), close to 40 percent of Russia’s total military spending was on arms procurement.<sup>15</sup> Russia spent 4.1 percent of its GDP on defense in 2022, a significant increase from 2021’s 3.7 percent.<sup>16</sup> This is likely to increase as combat losses and consumption of war matériel in Ukraine continue to mount.

In early 2018, Russia introduced its new State Armament Program 2018–2027, a \$306 billion investment in new equipment and force modernization. According to the IISS, the program continues its predecessor’s emphasis on modernization, but some of its aims are more modest than they were.<sup>17</sup> The extent to which modernization efforts are affected by the Russo–Ukraine war cannot yet be known, but while the war will increase Russia’s need to replace destroyed forces with modernized equipment, it will also reduce Russia’s ability, both financially and technologically, to make the necessary investments. Defense expenditures and investments in modernization programs are likely to remain high, especially as they are enabled by historically high energy revenues, but Russia’s ability to rebuild after the war will be challenged, though certainly not eliminated.

Russia has prioritized modernization of its nuclear capabilities and in 2021 claimed that its nuclear trifecta was more than 89 percent of the way through its modernization from the Soviet era.<sup>18</sup> However, by the end of 2022, modernization had reached only 91 percent of the arsenal.<sup>19</sup>

Russia has been planning to deploy the RS-28 (Satan 2) ICBM as a replacement for the RS-36, which is being phased out in the 2020s.<sup>20</sup> In June 2022, Putin announced that the missile had been “successfully tested” and, “with nuclear capability, will be deployed by the end of 2022.” Alexei Zhuravlyov, a member of the Russian State Duma, boasted “that the [RS-28] would reduce the United States to ‘nuclear ashes’ if they ‘think Russia should

not exist.”<sup>21</sup> Russia was able to carry out only one test of the RS-28 in 2022, but in spite of “myriad problems,” the missile is reportedly in operational production.<sup>22</sup>

In April 2020, the Kremlin stated that it had begun state trials for its T-14 Armata main battle tank in Syria.<sup>23</sup> After a series of delays, Russian troops allegedly will receive more than 40 Armata tanks in 2023.<sup>24</sup> The T-14 reportedly debuted in Ukraine in April 2023, but according to British military intelligence, the initial tranche of T-14s were in poor condition, and their deployment in Ukraine was primarily for propaganda purposes.<sup>25</sup> There are serious doubts that the T-14 will ever be produced in significant numbers.<sup>26</sup> Aside from the T-14 Armata, Russia has reportedly stepped up production of its T-90M and T-72B3 tanks, although the IISS reports that at the end of 2022, only 100 T-90Ms and 250 T-72B3s had been deployed, and the Oryx database of Russian equipment destroyed in Ukraine reports that 19 T-90Ms and 303 T-72B3s were destroyed or abandoned.<sup>27</sup>

Russia’s fifth-generation Su-27 fighter has fallen short of expectations, particularly with regard to stealth capabilities. In May 2018, the government cancelled mass production of the Su-27 because of its high costs and limited capability advantages over upgraded fourth-generation fighters.<sup>28</sup> As a result, only 30 Su-27s, in two variants, have been deployed.<sup>29</sup> In July 2021, Russia premiered the prototype for its Su-75 LTS Checkmate, which purportedly will be “the world’s second single-engine fighter plane to incorporate the most sophisticated radar-evasion and command systems.”<sup>30</sup> The only other plane in this category is the F-35. But there are serious doubts about the Su-75’s design and, given the delays that plagued other advanced Russian aircraft, Russia’s ability to build the Su-75 at the promised cost and according to the promised schedule.<sup>31</sup>

In December 2019, Russia’s sole aircraft carrier, the *Admiral Kuznetsov*, caught on fire during repair work.<sup>32</sup> The carrier was scheduled to begin sea trials in 2022,<sup>33</sup> but the addition of a propeller-rudder system, hull repairs, and an assortment of delays in other maintenance work have caused the trials to be delayed until 2024.<sup>34</sup> The carrier finally left dry dock in February 2023, but repairs continue, and the ship reportedly lacks a crew.<sup>35</sup> In May 2019, reports surfaced that Russia is seeking to begin

construction of a new nuclear-powered aircraft carrier in 2023 for delivery in the late 2030s, but the procurement's financial and technological feasibility remains questionable.<sup>36</sup>

Following years of delays, the *Admiral Gorshkov* stealth guided missile frigate was commissioned in July 2018. According to one report, the Russian Navy is expected to add 10 new *Gorshkov*-class frigates and 14 *Steregushchiy*-class corvettes by 2027. At the end of 2022, only two *Gorshkov*-class frigates and six *Steregushchiy*-class corvettes had been deployed.<sup>37</sup> In January 2023, Russia used one of its *Gorshkov*-class frigates as the launching platform for a Zircon hypersonic cruise missile from the western Atlantic.<sup>38</sup> Russia reportedly is making significant upgrades to its nuclear-powered battle cruiser *Admiral Nakhimov* as well, but these modernizations have been postponed to 2024, and there are significant doubts about whether Russia's shipyards possess the necessary technical and financial capacity to complete the project.<sup>39</sup>

In November 2018, Russia sold four *Admiral Grigorovich*-class frigates to India, which should take delivery of all four by 2026.<sup>40</sup> The ships had been intended for the Black Sea Fleet, but Russia found itself unable to produce a replacement engine following the imposition of sanctions after its 2014 invasion of Ukraine. Currently, only three *Admiral Grigorovich*-class frigates are in service.<sup>41</sup>

Russia's naval modernization continues to prioritize submarines. In June 2020, the first Project 955A Borei-A ballistic-missile submarine, the *Knyaz Vladimir*, was delivered to the Russian Northern Fleet as an addition to the three original Project 955 Boreis.<sup>42</sup> Russia reportedly will construct a total of 10 Borei-A class submarines; five have been delivered, but not all may be operational.<sup>43</sup> Russia also has a further six Delfin-class ballistic missile submarines and has deployed two Yasen-M class cruise missile submarines.<sup>44</sup>

The *Laika*-class submarines (previously called *Khaski*) are planned fifth-generation stealth nuclear-powered submarines. They are to be armed with Zircon hypersonic missiles, which have a reported speed of from Mach 5 to Mach 6.<sup>45</sup> According to a Russian vice admiral, these submarines will be two times quieter than current subs.<sup>46</sup> Construction of the first *Laika* was scheduled for the end of 2030, but whether Russia can afford the production costs is unclear.<sup>47</sup>

Russia also continues to upgrade its diesel electric *Kilo*-class subs.<sup>48</sup> It reportedly inducted the first improved Project 6363 *Kilo*-class submarine into its Pacific Fleet in November 2019<sup>49</sup> and has deployed 10 of these vessels, although their operational status is unclear.<sup>50</sup> According to one assessment, "the submarine class lacks a functioning air-independent propulsion system, which reduced the boats' overall stealth capabilities."<sup>51</sup> Russia's most recent Maritime Doctrine, published in July 2022, explicitly identifies the U.S. as Russia's main national security threat and strongly implies that the Russian navy will continue to focus on developing assets that can threaten the U.S.<sup>52</sup>

Russian logistics remain an area of serious weakness. The RAND Corporation has noted that Russian airlift capacity in 2017 was a mere one-fifth of what it had been in 1992, just after the collapse of the Soviet Union,<sup>53</sup> and Russia has lost additional lift capacity in Ukraine.<sup>54</sup>

Even more serious may be the lack of attention to logistics and supply that the Russian military has demonstrated in Ukraine. The U.K.'s Royal United Services Institute describes the initial Russian assault on Kyiv in 2022 as "a bad plan...executed poorly," in considerable part because the plan made no provision for resupply. As in other areas, Russian logistics capabilities can be impressive at the high end, but Russia is not always able to integrate these capabilities into larger operations or work as effectively across larger formations.<sup>55</sup>

The same is true of high-end systems such as the S-500 surface-to-air missile system. This system has been plagued by repeated delays. Design development purportedly was completed in 2011, but full production has been delayed until 2025. The most impressive aspect of the S-500 system is its range; a 2018 test struck a target almost 300 miles away, and the system is purportedly capable of attacking low-orbit satellites. Russia appears to be delaying introduction of the S-500 system so that it can keep production lines open for export versions of the S-400 system, which points to the ongoing budgetary challenges facing its forces.<sup>56</sup> Even Russia's touted hypersonic Kinzhal missiles have underperformed in Ukraine.<sup>57</sup>

Russia's counterspace and countersatellite capabilities are formidable. According to the U.S. Intelligence Community:

**Russia continues to train its military space elements, and field new antisatellite weapons to disrupt and degrade U.S. and allied space capabilities.** It is developing, testing, and fielding an array of nondestructive and destructive counterspace weapons—including jamming and cyberspace capabilities, directed energy weapons, on-orbit capabilities, and ground-based ASAT capabilities—to target U.S. and allied satellites.<sup>58</sup>

With respect to cyber capabilities, the Intelligence Community assesses that “**Russia will remain a top cyber threat as it refines and employs its espionage, influence and attack capabilities. Russia views cyber disruptions as a foreign policy lever to shape other countries’ decisions.**”<sup>59</sup>

**Military Exercises.** Russian military exercises, especially snap exercises, have masked real military operations in the past. In March 2022, Air Force General Tod D. Wolters, then Commander, U.S. European Command (EUCOM), testified that “Russia maintains a large conventional force presence along NATO’s borders and conducts snap exercises to increase instability.”<sup>60</sup> Concerns were heightened and eventually validated when Russia used such exercises in the spring and fall of 2021 to position forces close to Ukraine’s borders with Russia and Belarus—forces that it ultimately used to invade Ukraine.

Russia’s snap exercises are conducted with little or no warning and often involve thousands of troops and pieces of equipment.<sup>61</sup> In February 2022, just before Moscow’s second invasion of Ukraine, Russia and Belarus held joint snap exercises with 30,000 combat troops and special operations forces, fighter jets, Iskander dual-capable missiles, and S-400 air defense systems.<sup>62</sup> In September 2022, Russia held joint military exercises with China and several other nations in Russia’s Far East and the Sea of Japan.<sup>63</sup> Like all such exercises, this one served a variety of purposes, from projecting strength and showing off Russian allies to displaying hardware for sale and signaling Russian interest in a region.<sup>64</sup>

**Russian Losses in Ukraine.** The scale of Russian equipment losses in Ukraine is considerable. While no final accounting is possible, the open-source Oryx database has documented the destruction, damage, or capture of 1,937 Russian tanks, 838 armored fighting vehicles, and 2,317 infantry fighting vehicles, along with much other equipment.<sup>65</sup>

These losses, along with the potentially even more significant losses of Russian officers and crews, have brought an increase in U.S. and allied security that has been achieved at a remarkably low proportionate cost in U.S. assistance. Nevertheless, as summarized by General Christopher Cavoli of EUCOM in his 2023 posture statement:

Russia remains a formidable and unpredictable threat that will challenge U.S. and European interests for the foreseeable future. Russian air, maritime, space, cyber, and strategic forces have not suffered significant degradation in the current war. Moreover, Russia will likely rebuild its Army into a sizeable and more capable land force, all while suspending its implementation of the Treaty on Conventional Forces in Europe, as it has done since 2007.<sup>66</sup>

The war in Ukraine has demonstrated substantial weaknesses in the Russian armed forces and has significantly reduced Russia’s short-term ability to threaten U.S. and European interests in Europe, but it has also demonstrated the depth of Russia’s stocks of equipment, munitions, and supplies and the willingness of Putin’s government to continue to invest soldiers and treasure in the war, which is well into its second year.

### Threats to the Homeland

Russia is the only state adversary in the Europe region that possesses the capability to threaten the U.S. homeland with both conventional and nonconventional means. Although there does not currently appear to be a strong likelihood that Russia will use its nuclear capabilities against the United States directly, Putin “casts the war [in Ukraine] as an inevitable confrontation with the United States, which he accuses of threatening Russia by meddling in its backyard and enlarging the NATO military alliance,” and CIA Director William Burns has said that “none of us can take lightly the threat posed by a potential resort to tactical nuclear weapons or low-yield nuclear weapons” in Ukraine.<sup>67</sup>

Russia’s most recent National Security Strategy does not mention NATO directly, but it does claim that the U.S. is planning to deploy medium-range and short-range missiles in Europe—a possibility that NATO firmly denies. The same document also clearly states that Russia will use every means at

its disposal to achieve its strategic goals. Among its “basic concepts” is “ensuring national security—the implementation by public authorities in cooperation with civil society institutions and organizations of political, legal, military, socio-economic, informational, organizational and other measures aimed at countering threats to national security.”<sup>68</sup>

The most recent Russian military doctrine, which Putin signed in December 2014, specifically emphasizes the threat allegedly posed by NATO and global strike systems.<sup>69</sup> A 2020 doctrinal paper seemingly expanded the circumstances that Russia regards as justifying nuclear weapons use, and Russia’s rhetoric depicts it as inhabiting a harsh and Manichean world in which only the possession of nuclear weapons prevents it from being attacked and destroyed.<sup>70</sup>

**Strategic Nuclear Threat.** Russia possesses the largest arsenal of nuclear weapons (including short-range nuclear weapons) among the nuclear powers: a total inventory of 5,899 as of March 28, 2023.<sup>71</sup> It is one of the few nations with the capability to destroy many targets in the U.S. homeland and in U.S.-allied nations as well as the capability to threaten and prevent free access to the commons by other nations.

Russia has both intercontinental-range and short-range ballistic missiles and a varied arsenal of nuclear weapons that can be delivered by sea, land, and air. It also is investing significant resources in modernizing its arsenal and maintaining the skills of its workforce, and “modernization of Russia’s strategic nuclear triad is expected to remain a priority” under the new state armament program.<sup>72</sup> Admittedly, an aging nuclear workforce could impede this modernization, but modern weapons and equipment still allegedly constitute 91 percent of Russia’s nuclear triad.<sup>73</sup>

Russia relies on its nuclear arsenal to ensure its invincibility against any enemy, intimidate European powers, and deter counters to its predatory behavior in its “near abroad,” primarily in Ukraine, where it uses the threat of nuclear attack to deter other countries from supporting Ukraine’s defense, but also in the Baltic States.<sup>74</sup> This arsenal serves both as a deterrent to large-scale attack and as a protective umbrella under which Russia can modernize its conventional forces at a deliberate pace, but Russia also needs a modern and flexible military to fight local wars such as those against Georgia in

2008 and the renewed offensive against Ukraine that began in 2022.

Under Russian military doctrine, the use of nuclear weapons in conventional local and regional wars would be deescalatory because it would cause an enemy to concede defeat. In April 2022, for example, “Russia’s Foreign Minister said...that if the U.S. and Ukraine’s other Western allies continue to arm the country as it battles Moscow’s invading forces, the risk of the war escalating into a nuclear conflict ‘should not be underestimated.’”<sup>75</sup> General Cavoli discussed the risks presented by Russia’s nuclear weapons in his 2023 EUCOM posture statement:

Russia retains a vast stockpile of deployed and non-deployed nuclear weapons, which present an existential threat to the U.S. Homeland, our Allies, and partners, and is failing to comply with several ... legal obligations under the New START Treaty. President Putin’s dangerous nuclear rhetoric introduces strategic uncertainty.<sup>76</sup>

Putin’s June 2020 executive order, “Basic Principles of State Policy of the Russian Federation on Nuclear Deterrence,” outlines four scenarios in which Russia would use nuclear weapons:

19. The conditions specifying the possibility of nuclear weapons use by the Russian Federation are as follows:

- a) arrival of reliable data on a launch of ballistic missiles attacking the territory of the Russian Federation and/or its allies;
- b) use of nuclear weapons or other types of weapons of mass destruction by an adversary against the Russian Federation and/or its allies;
- c) attack by adversary against critical governmental or military sites of the Russian Federation, disruption of which would undermine nuclear forces response actions;
- d) aggression against the Russian Federation with the use of conventional weapons when the very existence of the state is in jeopardy.<sup>77</sup>

Russia’s reliance on nuclear weapons is based partly on their small cost relative to the cost of



conventional weapons, especially in terms of their effect, and on the government's inability to attract sufficient numbers of high-quality servicemembers. In other words, Russia sees its nuclear weapons as a way to offset the lower quantity and quality of its conventional forces.

Just as it is doing to deter Western support for Ukraine, Moscow has repeatedly threatened U.S. allies in Europe with nuclear deployments and even preemptive nuclear strikes.<sup>78</sup> The Russians justify their aggressive behavior by pointing to deployments of U.S. missile defense systems in Europe. In the past, these systems were not scaled or postured to mitigate Russia's advantage in ballistic missiles and nuclear weapons to any significant degree, but laser-armed Strykers arrived in Europe in 2021, the U.S. deployed Patriot missile defense systems to Poland in March 2022, and NATO leaders reaffirmed their commitment to full development of NATO ballistic missile defense at the Madrid Summit in July 2022.<sup>79</sup>

Russia continues to violate the Intermediate-Range Nuclear Forces (INF) Treaty, which bans the testing, production, and possession of intermediate-range missiles.<sup>80</sup> Russia first violated the treaty in 2008 and then systematically escalated its violations, moving from testing to producing to deploying the prohibited missile into the field. Russia fully deployed the SSC-8 cruise missile in violation of the INF Treaty early in 2017 and has deployed battalions with the missile at the Kapustin Yar missile test site in southern Russia, at Kamyshlov near the border with Kazakhstan, in Shuya east of Moscow, and in Mozdok in occupied North Ossetia.<sup>81</sup> In March 2023, Putin announced that Russia would deploy tactical nuclear weapons to Belarus, which had relinquished its nuclear weapons to Russia in the 1990s in exchange for security guarantees.<sup>82</sup>

In December 2018, in response to Russian violations, the U.S. declared Russia to be in material breach of the INF Treaty, a position with which NATO allies were in agreement.<sup>83</sup> The U.S. provided its six-month notice of withdrawal from the INF treaty on February 2, 2019, and officially withdrew from the treaty on August 2.<sup>84</sup> In 2023, the U.S. declared Russia noncompliant with the New START Treaty and denounced Moscow's invalid suspension of that treaty.<sup>85</sup>

Russia's sizable nuclear arsenal remains the only threat to the existence of the U.S. homeland

emanating from Europe and Eurasia. Although the potential for use of this arsenal remains low, the fact that Moscow continues to threaten Europe with nuclear attack demonstrates that this substantial nuclear capability will continue to play a central strategic role in shaping both Russian military and political thinking and the level of Russia's aggressive behavior with respect to other countries.

### Threat of Regional War

Many U.S. allies regard Russia as a genuine threat. At times, as seen in Russia's war against Ukraine, this threat is a military one. At other times, it involves less conventional tactics such as cyberattacks, exploitation of Russia's status as a source of energy, and propaganda. Today, as in the days of Imperial Russia, Moscow uses both the pen and the sword to exert its influence. Organizations like the Collective Security Treaty Organization (CSTO) and Eurasian Economic Union (EEU), for example, embody Russia's attempt to bind regional capitals to Moscow through a series of agreements and treaties.

The Russian war against Ukraine has blunted Moscow's ability to employ some of these tactics: Europe, for example, is moving away from dependence on Russian energy. But considerable portions of the Third World see Russia through anti-Western eyes and are therefore untroubled by—or even approve of—its actions.

Russia's terrorist attacks in Europe itself, including the 2018 poisoning of Russian GRU defector Sergei Skripal with nerve agents in Salisbury, U.K., and the likely responsibility of Russian agents for the death of 14 people in the U.K. alone, have received less attention than they deserve.<sup>86</sup> So has Russia's responsibility for other forms of transnational repression, including its abuse of international legal cooperation mechanisms.<sup>87</sup> Finally, Russia's alleged responsibility for the attacks that destroyed the Nordstream 1 and 2 pipelines in October 2022 points again to Moscow's willingness to use force in minimally deniable ways that are profoundly destabilizing and threatening to its neighbors.

Russia also uses espionage to damage U.S. interests. In February 2022, the U.S. expelled 12 officials from Russia's mission to the United Nations. According to the U.S. Mission to the U.N., the officials had "abused their privileges of residency in the U.S. by engaging in espionage activities that are adverse

to our national security.”<sup>88</sup> In March 2022, Brussels, where the headquarters of NATO is located, expelled 21 Russian diplomats for “alleged threats and posing threats to security.”<sup>89</sup> According to one report, Russian spies are becoming harder to track because they infiltrate companies, schools, and governments.<sup>90</sup>

Expulsions are not a permanent solution because “Russia tends to send back new spies to replace the ones who have left.”<sup>91</sup> Though the expulsion of an estimated one-half of all Russian spies in Europe in the aftermath of Russia’s re-invasion of Ukraine will have dealt a blow to Russian capabilities, the fact that such spying occurs is further evidence of Russia’s willingness to use whatever means it feels is necessary to achieve its objectives.<sup>92</sup> Russia also has sought to leverage its relations with its limited number of partners, including Nicaragua and Venezuela in the Western Hemisphere, to increase its intelligence collection capabilities.<sup>93</sup>

**Pressure on Nordic, Central, and Eastern Europe.** Moscow poses a security challenge to members of NATO that border Russia. Until recently, a conventional Russian attack against a NATO member was thought unlikely, but Russia’s assault on Ukraine and threats against NATO members that support Ukraine raise the specter of a possible larger conflict involving NATO.

Russia continues to use cyberattacks, espionage, and propaganda to sow discord among NATO member states and undermine the alliance. After decades of Russian domination, the countries of Central and Eastern Europe factor Russia into their military planning and foreign policy formulation in a way that is simply unimaginable in many Western European countries and North America. Estonia and Latvia have sizable ethnic Russian populations, and there is concern that Russia might exploit this as a pretext for aggression—a view that is not without merit in view of Moscow’s irredentist rhetoric, use of this as a rationale to justify its invasion of Ukraine in 2014 and 2022, and similar exploitation of this approach in the lead-up to its 2008 attack on Georgia.

The assessments of the three Baltic States are instructive. The Estonian Foreign Intelligence Service, for example, concludes that:

The only existential threat to the security of our region, including Estonia’s sovereignty, stems from Russia. A military attack against

Estonia is unlikely in 2023, as the Russian Armed Forces units based near the Estonian border are engaged in hostilities in Ukraine. At the same time, Russia’s foreign policy ambitions driven by the Kremlin’s belligerence and imperialism have significantly increased the security threat.<sup>94</sup>

**According to Lithuania’s *National Threat Assessment 2023*:**

The sanctions that weaken Russia’s economy will not impede the regime’s ability to prioritise the funding of increased military needs at the expense of public welfare. Nevertheless, the war against Ukraine will diminish the Russian military threat in the Baltic Sea Region only temporarily....

Russia justifies its expansionist policy by employing a historical narrative based on various manipulations of the Soviet victory against the Nazi Germany. This narrative promotes the Kremlin regime’s fictitious claims about exclusive interests in the post-Soviet region, whereas its aggressive policy and military actions are justified by the need to protect Russia’s influence<sup>95</sup>

In words that still ring true today, Lithuania’s *National Threat Assessment 2019* states that Russia “exploits democratic freedoms and rights for its subversive activity” and “actually promotes its aggressive foreign policy” while “pretending to develop cultural relations” in Lithuania.<sup>96</sup>

Latvian authorities describe the propaganda used by Russia against Ukraine in similar terms:

The task of war propaganda was...to artificially create an image of an “external enemy” for Russian society. Primarily, it was the imaginary “Nazi (in some cases also “fascist”) regime” in Kyiv. In other cases, it was NATO, the USA, Great Britain, or the Baltic States. In some cases, it was more convenient for Russian propaganda subjects to use the term “Anglo-Saxons” to describe their “external enemy.”<sup>97</sup>

**Although the Russian assault on Ukraine badly damaged Russia’s “so-called ‘compatriot’ policy,**

which was previously the cornerstone of Russia's 'soft' power,"<sup>98</sup> by reducing Russia's attractiveness to ethnic Russians in Latvia, Latvia still assesses that "Russia in 2022 once again confirmed its status as an aggressor and its unfulfilled superpower ambitions."<sup>99</sup>

In March 2017, General Curtis Scaparrotti, then Commander, U.S. European Command, and NATO Supreme Allied Commander Europe, characterized Russian propaganda and disinformation as an extension of Russia's military capabilities: "The Russians see this as part of that spectrum of warfare, it's their asymmetric approach."<sup>100</sup> That assessment remains true. As General Cavoli has recently pointed out, disinformation is one of the "range of tools" that Russia employs "to advance its foreign policy objectives to coerce neighboring states, divide the Alliance, and expand its global influence."<sup>101</sup>

Russia has sought to use disinformation to undermine NATO's Enhanced Forward Presence (eFP) in the Baltics. A disinformation campaign named Ghostwriter, for example, has been ongoing since 2017. In 2020, hackers "fabricated an interview with U.S. Army Europe commander Lt. Gen. Christopher Cavoli, which was published on a website notorious for spreading disinformation and was then picked up by other sites," alleging that he had made "statements about a lack of preparedness for [NATO's Defender Europe-20] exercise among Polish and Baltic militaries."<sup>102</sup> In 2022, according to the government of Lithuania, "Ghostwriter...significantly decreased its activity against NATO states."

It is likely that the decrease in cyber-enabled information operations in Lithuania is temporary and related to redirected effort towards Ukraine, which has been a target of numerous Ghostwriter attacks in recent years. Nonetheless, attempts to gather Lithuanian citizens' data indicate likely plans to target Lithuania in the future attacks.<sup>103</sup>

U.S. troops stationed in Poland for NATO's eFP have been the target of similar Russian disinformation campaigns.<sup>104</sup> In 2020, "Russian-sponsored actors released a forged letter online where Polish Brigadier General Ryszard Parafianowicz appeared to criticize openly the American presence in his country during the US-led exercise Defender-Europe 20."<sup>105</sup> As noted, a fabricated interview with

General Cavoli published online was similarly meant to undermine NATO's reputation among the public.<sup>106</sup> As one report put it, "Russia's state propaganda channels RT and Sputnik remain very keen to exploit to the maximum any incidents involving eFP personnel, and to repeat the Kremlin's anti-NATO and anti-eFP narrative."<sup>107</sup>

In February 2022, the Baltics and Poland together urged the largest social media companies to restrict Russian disinformation about the war in Ukraine from "spreading across [their] platforms." The Baltic States also banned a number of Russian and Belarusian channels that allegedly were disseminating propaganda to justify Moscow's war.<sup>108</sup> In March 2022, the EU's Council of Europe banned Russian state media outlets RT and Sputnik.<sup>109</sup>

Most important of all, Russia has repeatedly demonstrated a willingness to use military force to change the borders of Europe. Vladimir Putin rose to power in Russia because of his role in Russia's second war against Chechnya in 1999. In 2008, under Putin, Russia attacked Georgia. When Kremlin-backed Ukrainian President Viktor Yanukovich failed to sign an Association Agreement with the EU in 2013, street demonstrations led to his ouster early in 2014. Russia responded by sending troops, aided by pro-Russian local militia, to occupy the Crimean Peninsula under the pretext of "protecting Russian people." This led to Russia's annexation of Crimea, the first forcible annexation of territory in Europe since World War II.<sup>110</sup>

Russia's annexation effectively cut Ukraine's coastline in half, and Russia claimed rights to underwater resources off the Crimean Peninsula.<sup>111</sup> Russia deployed 30,000 troops to Crimea and embarked on a major program to build housing, restore airfields, and install new radars on the peninsula.<sup>112</sup> In May 2018, Russia inaugurated the first portion of a \$7.5 billion, 11.8-mile bridge connecting Russia with Kerch in occupied Crimea.<sup>113</sup> The effect on Ukraine's regional economic interests can be seen in the fact that 30 percent of the cargo ships that served Mariupol could not clear the span, depriving Ukraine of the revenue that it would have derived from associated port activity and the export and import of goods.<sup>114</sup> In December 2019, Russia completed a new rail bridge over the Kerch Strait that the EU condemned as "yet another step towards a forced integration of the illegally annexed peninsula."<sup>115</sup> The U.S., for its part, regularly protested

Russia's illegal restriction of Black Sea freedom of navigation.<sup>116</sup>

Russia invaded Ukraine in February 2022 with the goal of bringing the entire nation under Putin's control. Though Ukrainians defeated Russia's attempt to seize the capital and large swathes of central Ukraine, Russia rapidly occupied one-fifth of the country, an area that includes most of Ukraine's industrial sector, its port cities on the Black Sea, and the major transport corridors for grain exports. In September 2022, Russia held fake referenda in occupied portions of Ukraine, claiming that the results justified its annexations.<sup>117</sup>

Control of Crimea allows Russia to use the Black Sea as a platform from which to launch and support naval operations along the Ukrainian coastline as part of Moscow's renewed offensive against Ukraine.<sup>118</sup> Russia also has been using the naval base at Sevastopol for operations in the Eastern Mediterranean, but Turkey's closure of the Bosphorus Strait to military traffic in late February 2022 in response to Russia's war against Ukraine has ended this option, at least temporarily.<sup>119</sup> Before Turkey closed the Strait, the Black Sea fleet had received six *Kilo* diesel submarines and three *Admiral Grigoryevich*-class frigates equipped with Kalibr-NK long-range cruise missiles.<sup>120</sup> Kalibrs have a range of at least 2,500 kilometers, placing cities from Rome to Vilnius within range of Black Sea-based cruise missiles.<sup>121</sup> In April 2022, in a significant operational and symbolic loss for Russia, Ukrainian forces sank the *Moskva* guided missile cruiser, which had been the flagship of Russia's Black Sea Fleet.<sup>122</sup>

In Moldova, Russia supports the breakaway enclave of Transnistria, where another frozen conflict festers to Russia's advantage. According to the Congressional Research Service:

Russia stations about 1,500 troops in Transnistria, most of whom are reportedly local residents; Moldova formally accepts a few hundred of these personnel as peacekeepers. In 2018, the U.N. General Assembly passed a resolution calling on Russia to withdraw its troops from Moldova "unconditionally and without further delay."...

A conflict resolution process formally operates in a "5+2" format under the chairpersonship of the Organization for Security and Cooperation

in Europe (OSCE), with the OSCE, Russia, and Ukraine as mediators and the EU and the United States as observers.... The EU also supports conflict management through an EU Border Assistance Mission, which has sought to help Moldova and Ukraine combat transborder crime and facilitate trade. Since 2022, the Mission has contributed to refugee crisis management and assisted the EU's efforts to establish alternative land routes for Ukrainian exports.<sup>123</sup>

Russia continues to occupy 12 percent of Moldova's territory. On January 22, 2019, in an effort to enhance its control of the breakaway region, Russia opened an office in Moscow for the Official Representation of the Pridnestrovian Moldavian Republic in the Russian Federation.<sup>124</sup> In February 2022, a few weeks before Russia's second invasion of Ukraine, Russian armed forces staged military drills in Transnistria. Concerns that Russian troops stationed in Transnistria could be mobilized for the war in Ukraine persist.<sup>125</sup>

Russia's other major ally in Europe is Serbia. Balkan politics are exceptionally complicated, but Russia's goal in the Balkans is clear: to create difficulties for NATO and the EU in the region by supporting Serbia's position on Kosovo.<sup>126</sup> While Russia has not deployed large-scale military forces to Serbia and is unlikely to do so, it does cultivate Balkan paramilitary groups and encourage cooperation between the Wagner Group and Serbia. In essence, Moscow wants to ensure that the frozen conflict in the Balkans, like the one in Moldova, does not thaw to Russia's disadvantage.<sup>127</sup>

Russia's major outpost in Europe, Kaliningrad, also remains a strategic challenge. Russia's permanent stationing of Iskander missiles in Kaliningrad in 2018 occurred a year to the day after NATO's eFP deployed to Lithuania.<sup>128</sup> Russia reportedly has deployed tactical nuclear weapons, the S-400 air defense system, and P-800 anti-ship cruise missiles to Kaliningrad.<sup>129</sup>

Russian missile deployments are not limited to Kaliningrad. Russia has outfitted a missile brigade in Luga, Russia, just 74 miles from the Estonian city of Narva, with Iskander missiles.<sup>130</sup> It also has deployed Iskanders to the Southern Military District at Mozdok near Georgia, and Russian military officials have reportedly asked manufacturers to increase the missiles' range and improve their

accuracy.<sup>131</sup> Russia has been firing Iskanders with “mystery munitions,” described as “decoys meant to trick air-defense radars and heat-seeking missiles,” at targets in Ukraine.<sup>132</sup> It also deployed Iskander missiles, as well as the S-400 air defense system, to Belarus in 2022, and Belarusian officials have stated that these systems are operational.<sup>133</sup>

Nor is Russia deploying missiles only in Europe. Russia announced plans to deploy additional missile systems on Paramushir and Matua, two islands in the northern portion of the Kuril Island chain claimed by Japan, in September 2019;<sup>134</sup> announced the deployment of S-300V4 air defense missile systems on Iturup in December 2020;<sup>135</sup> deployed Bastion coastal defense missile systems to Matua in December 2021;<sup>136</sup> conducted military drills on the Kuril Islands that involved more than 3,000 troops and hundreds of pieces of army equipment in March 2022;<sup>137</sup> and announced its deployment of the Bastion coastal missile system on the Kuril Islands in December 2022.<sup>138</sup>

Russia represents a real and potentially existential threat to NATO member countries in Nordic, Central, and Eastern Europe. In addition to its aggression in Georgia and Ukraine, support for Transnistria, and outpost in Kaliningrad, Russia has threatened countries that provide support to Ukraine. It also has threatened Finland and Sweden because of their desire to join NATO.<sup>139</sup> As long as the war in Ukraine continues, Russia is not likely to seek conventional conflict on other fronts, but it will continue to use nonlinear means in an effort to pressure and undermine the NATO alliance and any non-NATO country that opposes Moscow’s political objectives.

**Militarization of the High North.** Because nationalism is on the rise in Russia, Vladimir Putin’s Arctic militarization strategy is popular among the population. For Putin, the Arctic is an area that allows Russia to flex its muscles without incurring any significant geopolitical risk.

Russia is also eager to promote its economic interests in the region. Half of the world’s Arctic territory and half of the Arctic region’s population are located in Russia. It is well known that the Arctic is home to large stockpiles of proven but unexploited oil and gas reserves, most of which are thought to be located in Russia. In particular, Russia hopes that the Northern Sea Route (NSR) will become one of the world’s most important shipping lanes.

According to one report, “[t]he Kremlin’s dominance due to its unique topography and overwhelming military presence has made it impregnable in the Arctic.”<sup>140</sup> Additionally, “Russian hardware in the High North area includes bombers and MiG31BM jets, and new radar systems close to the coast of Alaska.”<sup>141</sup> In February 2023, Admiral Daryl Caudle, head of U.S. Fleet Forces Command, stated that “Russia now has six bases, 14 airfields, 16 deep-water ports, and 14 icebreakers built” in the region and “dominate[s] the Arctic geography and possess[es] the corresponding ability to dominate in capability and infrastructure.”<sup>142</sup>

According to U.S. Second Fleet Commander Vice Admiral Dan Dwyer, Russia’s new maritime doctrine, released in July 2022, shows that Moscow is “prioritizing the Arctic as its most important maritime direction, pledging to protect these waters ‘by all means.’ This includes increasing attention on the Arctic littorals as well as the introduction of new missile capabilities...to focus on its bastion of the Northern Fleet.” Previously, “the Arctic was their number three priority. The Atlantic was their number one priority. Now Russians realize that the Arctic is the key to their economy and to their defense as they see the receding of the Arctic ice cap.”<sup>143</sup>

Russia has staged a series of statement activities in the Arctic. In 2007, for example, Artur Chilingarov, then a member of the Russian Duma, led a submarine expedition to the North Pole and planted a Russian flag on the seabed. Later, he declared that “[t]he Arctic is Russian.”<sup>144</sup> In March 2021, three Russian ballistic missile submarines punched through the Arctic ice near the North Pole.<sup>145</sup> In August 2022, during the Northern Fleet’s Barents Arctic exercise, a corvette based in Kaliningrad sailed to the White Sea in the Arctic where it fired a Kalibr cruise missile at a target on the coast.<sup>146</sup>

In May 2017, Russia announced that its buildup of the Northern Fleet’s nuclear capacity is intended “to phase ‘NATO out of [the] Arctic.’”<sup>147</sup> In June 2022, Russia withdrew from a nuclear safety program in the Arctic region, raising concerns in the West “about a new period of heightened nuclear risks.”<sup>148</sup> Russia also has stationed a floating nuclear power plant on the northern coast of Siberia at the town of Pevek. It will provide energy for a number of resource extraction projects including gold and

tin mines. Russia's state-owned nuclear company Rosatom is seeking to build four additional floating reactors in the vicinity by 2030.<sup>149</sup>

Although the Arctic region has been an area of low conflict among the Arctic powers, Russia's war against Ukraine and probing activities in the Arctic raise questions about whether that will remain true. It was recently reported, for example, that Russian fishing vessels with military radio equipment have docked in the Faroe Islands, which are strategically located just below the Arctic Circle between the coast of Iceland and Scotland in the United Kingdom, more than 200 times since 2015, likely conducting espionage.<sup>150</sup> NATO is a collective security organization that is designed to defend the territorial integrity of its members. Six NATO members (Canada, Denmark, Finland, Iceland, Norway, and the United States) are Arctic countries, and all six have territory above the Arctic Circle.<sup>151</sup>

Because Russia is an Arctic power, its military presence in the region is to be expected, but it is also a matter of serious concern because of Russia's pattern of aggression. In the Arctic, sovereignty equals security. Respecting national sovereignty in the Arctic would ensure that the chances of armed conflict in the region remain low. Because NATO is an intergovernmental alliance of sovereign nation-states built on the consensus of its members, it has a role to play in Arctic security. In the words of NATO Secretary-General Jens Stoltenberg:

Russia's military build-up is the most serious challenge to stability and Allied security in the High North.... A strong, firm and predictable Allied presence is the best way to ensure stability and protect our interests. We cannot afford a security vacuum in the High North. It could fuel Russian ambitions, expose NATO, and risk miscalculation and misunderstandings.<sup>152</sup>

In March 2017, a decree signed by Putin gave the Federal Security Service (FSB), which controls law enforcement along the Northern Sea Route, an Arctic shipping route linking Asia and Europe as well as additional powers to confiscate land "in areas with special objects for land use, and in the border areas."<sup>153</sup> Russia's Arctic territory is included within this FSB-controlled border zone. The FSB and its subordinate coast guard have added patrol

vessels and have built up Arctic bases, including a coast guard base in Murmansk that was opened in December 2018.<sup>154</sup>

The Russian National Guard, which reports to Putin, is likewise taking on an increased role in the Arctic and is now charged with protecting infrastructure sites that are deemed to be of strategic importance, including a new liquefied natural gas (LNG) export terminal at Sabetta that was opened in December 2017.<sup>155</sup> In April 2021, shareholders of Novatek, Russia's second-largest natural gas producer, "approved external financing of \$11 billion for the Arctic LNG 2 project, which [was] expected to start production of [LNG] in 2023."<sup>156</sup> In December 2022, Novatek announced that despite sanctions, it is still seeking to begin gas production at the site in December 2023.<sup>157</sup>

In May 2018, Putin issued a presidential decree setting a target of 80 million tons shipped across the NSR by 2024.<sup>158</sup> In 2022, 34 million tons of goods, mostly oil and gas, were shipped by way of the NSR. Despite the impact of sanctions, Russia has announced new investments in ice monitoring systems and the deepening of shipping channels for a new Arctic oil terminal along the NSR.<sup>159</sup>

Russia also has been investing in military bases in the Arctic. Its Arctic Trefoil base on Alexandra Land Island, commissioned in 2017, can house 150 soldiers for up to 18 months.<sup>160</sup> Old Soviet-era facilities have been reopened, and more that are currently mothballed could be refurbished if necessary.<sup>161</sup> All of the land forces from many Russian bases on the Kola Peninsula have been sent to Ukraine to fight in a war that "has taken a toll on both Russian Arctic readiness and its deployable assets."<sup>162</sup> Nevertheless, Russia has continued to make steady progress on basing improvements in the region.

[Satellite images] demonstrate continued work on the radar stations at the Olenegorsk site, on the Kola Peninsula in northwest Russia, and at Vorkuta, just north of the Arctic circle. They also appear to show work moving ahead to complete one of five Rezonans-N radar systems at Ostrovnoy, a site located by the Barents Sea, near Norway and Finland in Russia's west. The Rezonans-N systems are claimed by Russian officials to be able to detect stealth aircraft and objects.

Three new radomes, the weatherproof enclosures used to protect radar antennas, were completed this year at the Tiksi air defense site, in the far northeast.... There are also improvements to a runway and parking apron at Nagurskoye air base—Russia’s northernmost military facility—and runway improvements at “Temp” air base, on Kotelny Island, in the northeast of the country.<sup>163</sup>

In 2017, Russia activated a new radar complex on Wrangel Island.<sup>164</sup> In 2019, it announced plans to lay a nearly 8,000-mile fiber-optic cable across its Arctic coast, linking military installations along the way from the Kola Peninsula through Vladivostok.<sup>165</sup> Construction of the cable began in August 2021 and is due to be completed in 2026.<sup>166</sup>

Air power in the Arctic is increasingly important to Russia, which has 14 operational airfields in the region along with 16 deep-water ports, “a new command, and roughly 50 icebreakers...some of which are nuclear powered.”<sup>167</sup> Russia briefly paused long-range bomber and submarine patrols across the Arctic following its invasion of Ukraine but restarted them in November 2022.

According to Royal Canadian Air Force Lieutenant General Alain Pelletier, Deputy Commander, North American Aerospace Defense Command (NORAD), Russia’s “activities are not only limited to the long-range aviation. Russia uses its submarines now both on the Atlantic coast and the Pacific coast to actually demonstrate its strategic capabilities and to present a threat to North America.”<sup>168</sup> During joint exercises with China in September 2022, at least four Russian and three Chinese naval vessels sailed in a single formation within the U.S. exclusive economic zone (EEZ) about 75 nautical miles off Kiska Island in the Alaskan Aleutians in “Moscow and Beijing’s second joint patrol in 12 months.”<sup>169</sup>

In November 2022, Russia launched the *Yakutia*, the fourth Project 22220 nuclear-powered icebreaker.<sup>170</sup> Russia’s fleet of icebreaker and ice-capable ships is around 10 times the size of the U.S. fleet.<sup>171</sup>

Russia also has invested heavily in developing drones capable of operating in the High North. According to a Finnish unmanned aircraft specialist:

In 2019, state sources announced the existence of another UAV [unmanned aerial vehicle]

able to remain in-flight for four days in the Arctic without the need to rely on jammable satellite-based navigation. In 2021, Radar MMS introduced a heavy lift cargo drone capable of working at -70 degree Celsius. It is also documented that Russia is using underwater unmanned drones (UUVs), with some, such as the nuclear-powered Poseidon, developed particularly for Arctic waters.<sup>172</sup>

Russia’s Northern Fleet “is made up of 26 submarines, 10 surface combatant ships, 16 patrol and coastal vessels, eight mine warfare/mine counter-measure ships, and eight amphibious platforms, plus fighter jets, anti-submarine aircraft and air defense systems.”<sup>173</sup> One U.S. ally believes that Russia will seek a more consistent presence in the Barents Sea and Atlantic Ocean through lengthened submarine patrols.<sup>174</sup>

Though Russia’s development of its military capabilities in the Arctic region continues, the likelihood of armed conflict remains low. However, physical changes in the region mean that the posture of interested nations will continue to evolve. It is clear that Russia intends to exert a dominant influence. As summarized by a U.S. Department of State official:

[The U.S. has] concerns about Russia’s military buildup in the Arctic. Its presence has grown dramatically in recent years with the establishments of new Arctic commands, new Arctic brigades, refurbished airfields and other infrastructure, deep water ports, new military bases along its Arctic coastline, an effort to establish air defense and coastal missile systems, early warning radars, and a variety of other things along the Arctic coastline. We’ve seen an enhanced ops [operations] tempo of the Russian military in the Arctic, including last October one of the largest Russian military exercises in the Arctic since the end of the Cold War. So there is some genuine and legitimate concern there on the part of the United States and our allies and partners about that behavior in the Arctic.<sup>175</sup>

**Destabilization in the South Caucasus.** The South Caucasus sits at a crucial geographical and cultural crossroads and has been strategically

important, both militarily and economically, for centuries. Although the countries in the region (Armenia, Georgia, and Azerbaijan) are not part of NATO and therefore do not receive a security guarantee from the United States, they have participated to varying degrees in NATO and U.S.-led operations. This is especially true of Georgia, which aspires to join NATO.

Russia views the South Caucasus as part of its natural sphere of influence and stands ready to exert its influence by force if necessary. In August 2008, Russia invaded Georgia, coming as close as 15 miles to the capital city of Tbilisi. A decade later, several thousand Russian troops occupied the two Georgian regions of South Ossetia and Abkhazia.

Russia has sought to deepen its relationship with the two occupied regions. In 2015, it signed so-called integration treaties with South Ossetia and Abkhazia that, among other things, call for a coordinated foreign policy, creation of a common security and defense space, and implementation of a streamlined process for Abkhazians and South Ossetians to receive Russian citizenship.<sup>176</sup> The Georgian Foreign Ministry criticized the treaties as a step toward “annexation of Georgia’s occupied territories,”<sup>177</sup> both of which are still internationally recognized as part of Georgia. In January 2018, Russia ratified an agreement with the *de facto* leaders of South Ossetia to create a joint military force—an agreement that the U.S. condemned.<sup>178</sup>

South Ossetia’s former leader, Anatoli Bibilov, had planned to hold a referendum to decide whether the region should join Russia on July 17, 2022, but his successor, Alan Gagloev, has cancelled the plebiscite as “premature.”<sup>179</sup> Russia’s “creeping annexation” of Georgia has left towns split in two and families separated by military occupation and the imposition of an internal border (known as “borderization”).<sup>180</sup> In May 2020, the U.S. embassy in Tbilisi reported that Russian-led security forces were continuing to erect unauthorized fences and reinforcing existing illegal “borderization” efforts near a number of Georgian villages.<sup>181</sup>

Russia maintains a sizable military presence in Armenia based on an agreement that gives Moscow access to bases in that country at least until 2044.<sup>182</sup> The bulk of Russia’s forces, consisting of 3,500 soldiers, dozens of fighter planes and attack helicopters, 74 T-72 tanks, and an S-300 air defense system, are based around the 102nd Military Base.<sup>183</sup> Russia

and Armenia have also signed a Combined Regional Air Defense System agreement. Despite the election of Prime Minister Nikol Pashinyan in 2018 following the so-called Velvet Revolution, Armenia’s cozy relationship with Moscow remains unchanged.<sup>184</sup> Armenian troops even deployed alongside Russian troops in Syria to the dismay of U.S. policymakers.<sup>185</sup>

Another source of regional instability is the Nagorno–Karabakh conflict, which began in 1988 when Armenia made territorial claims to Azerbaijan’s Nagorno–Karabakh Autonomous Oblast.<sup>186</sup> By 1992, Armenian forces and Armenian-backed militias had occupied 20 percent of Azerbaijan, including the Nagorno–Karabakh region and seven surrounding districts. A cease-fire agreement was signed in 1994, and the conflict has been described as frozen since then. In 2020, major fighting broke out along the front lines. After six weeks of fighting and 7,000 killed, Azerbaijan liberated its internationally recognized territory, “which had been under Armenian occupation since the early 1990s.”<sup>187</sup>

The conflict ended on November 9, 2020, when Armenia and Azerbaijan signed a Russian-brokered cease-fire agreement.<sup>188</sup> Azerbaijan had won a decisive victory, recovering most of the land taken by the Armenians in the first conflict. As part of the nine-point cease-fire plan, nearly 2,000 Russian peacekeeping soldiers were deployed to certain parts of Nagorno–Karabakh that are populated largely by ethnic Armenians. Russia remained the primary influencer in the region, serving as sole mediator for the Nagorno–Karabakh conflict and providing a peacekeeping force, yet maintained at least three military bases in Armenia and sold arms to both sides of the conflict.

By mid-2022, it was clear that two significant factors had affected the military situation on the ground. First, Azerbaijan developed strong defense ties with Turkey and Israel in the decade preceding the cease-fire. The billions of dollars in sophisticated weapons and technology acquired from Israel<sup>189</sup> and advanced military training received from Turkey have contributed to Azerbaijan’s military superiority in the South Caucasus.<sup>190</sup> The Azerbaijan–Israel–Turkey “troika” has been a disruptor within the Russian sphere of influence.

Second, since Vladimir Putin’s invasion of Ukraine, Russia’s dominance in the South Caucasus has diminished significantly. To sustain its war effort in the face of significant losses:



The Russian military redeployed elements of the 15th Separate Guards Motorized Rifle Brigade—Russia’s only dedicated peacekeeping brigade—from Nagorno-Karabakh to Ukraine in March 2022. Ukraine’s General Staff reported that Ukrainian forces severely degraded the 15th Separate Guards Motorized Rifle Brigade, killing about 800 and wounding about 400 soldiers of the brigade’s 1,800 soldiers that deployed to Ukraine as of June 2022. Russia will likely lose military influence in other post-Soviet states since Moscow has redeployed elements of permanently stationed Russian forces from Russian bases in Kyrgyzstan, occupied Georgia (Abkhazia and South Ossetia), and Tajikistan to fight in Ukraine.<sup>191</sup>

For decades, Russia has viewed the South Caucasus as a vital theater and has used military aggression, economic pressure, and the stoking of ethnic tensions to exert influence and control, usually to promote outcomes that are at odds with U.S. and NATO interests. It is certain that Russian influence in the region will continue, but current factors on the ground have caused its power to decline, at least temporarily.

#### **Increased Activity in the Mediterranean.**

Russia has had a military presence in Syria for decades, but in September 2015, it became the decisive actor in Syria’s civil war by saving Bashar al-Assad from being overthrown and strengthening his hand militarily, thus enabling government forces to retake territory lost during the war. Although conflicting strategic interests cause the relationship between Assad and Putin to be strained at times, Assad still needs Russian military support to take back Idlib province, a goal that he and Putin probably share.<sup>192</sup> Russia’s Hmeymim Air Base is located close to Idlib, making it vulnerable to attacks from rebel fighters and terrorist groups, and Moscow instinctively desires to protect its assets. Though Assad’s only goal is to restore sovereignty over all of Syria, Russia’s main focus is maintaining its position in the region. Moscow therefore leverages its support for Assad to achieve that end.

In January 2017, Russia signed an agreement with the Assad regime to “expand the Tartus naval facility, Russia’s only naval foothold in the Mediterranean, and grant Russian warships access to Syrian waters and ports.... The agreement will last for 49

years and could be prolonged further.”<sup>193</sup> Russia reportedly is reinforcing its naval group in the Mediterranean Sea with warships and submarines armed with Kalibr cruise missiles.<sup>194</sup> In May 2021, the Voice of America reported that Russia is expanding its navy base at Tartus and “planning to construct a floating dock to boost the port’s ship repair facilities.”<sup>195</sup> Russia maintains 2,500 troops in Syria.<sup>196</sup>

The agreement with Syria also includes upgrades to the Hmeymim Air Base at Latakia, including repairs to a second runway.<sup>197</sup> Russia is extending one of its two runways by 1,000 feet, which would “allow the base to support more regular deployments of larger and more heavily-laden aircraft.”<sup>198</sup> In May 2021, Russia declared the ability to operate nuclear-capable bombers from Hmeymim as a result of recent airfield upgrades.<sup>199</sup>

Russia deployed the S-400 anti-aircraft missile system to Hmeymim in late 2015.<sup>200</sup> It also has deployed the Pantsir S1 system. “The two systems working in tandem provide a ‘layered defense,’” according to one account, “with the S-400 providing long-ranged protection against bombers, fighter jets, and ballistic missiles, and the Pantsir providing medium-ranged protection against cruise missiles, low-flying strike aircraft, and drones.”<sup>201</sup> Russia currently operates out of Hmeymim on a 40-year agreement and continues to entrench its position there, as demonstrated by its recent building of reinforced concrete aircraft shelters.<sup>202</sup>

Russian pilots have occasionally acted dangerously in the skies over Syria. In May 2017, for example, a Russian fighter jet intercepted a U.S. KC-10 tanker, performing a barrel roll over the top of the KC-10.<sup>203</sup> That same month, Russia stated that U.S. and allied aircraft would be banned from flying over large areas of Syria pursuant to a deal made by Russia, Iran, and Turkey. The U.S. responded that the deal does not “preclude anyone from going after terrorists wherever they may be in Syria.”<sup>204</sup>

The U.S. and Russia have a deconfliction hotline to avoid midair collisions and incidents, but incidents have occurred on the ground as well as in the air, although not nearly as often. From March 2022 to May 2023, Russian aircraft violated deconfliction protocols more than 80 times, including by flying over U.S. troops more than 24 times.<sup>205</sup> In February 2022, U.S. F-16 fighter jets and other coalition aircraft escorted three Russian aircraft in eastern Syria when the Russians flew into coalition-restricted

airspace.<sup>206</sup> Another notable incident occurred in November 2022 when Russia fired an SA-22 Pantsir surface-to-air missile against a U.S. MQ-9 Reaper drone over Syria. The missile passed within 40 feet of the drone, which was damaged when the missile detonated.<sup>207</sup>

In October 2018, Egyptian President Abdel Fattah al-Sisi signed a strategic cooperation treaty with Russia.<sup>208</sup> In November 2018, hoping to solidify its relations with Egypt, Russia approved a five-year agreement for the two countries to use each other's air bases.<sup>209</sup> Since then, Egypt and Russia have expanded their ties to include tourism, energy, political coordination, and military support.<sup>210</sup> Leaked intelligence reports detail a plan under which Egypt would secretly produce and deliver 40,000 rockets along with gunpowder to Russia, although it is believed that this plan has not yet been implemented.<sup>211</sup>

Russia remains active in Libya. Wagner units reportedly “are mostly present in the eastern region, specifically at al-Khadim air base near al-Marj city as well as in the cities of Sirte and al-Jufrah in the central region...where the majority of Wagner's fighters and most valuable assets, including its advanced air defense systems and fighter jets, are believed to be located.”<sup>212</sup> The Wagner Group, a private military company with direct ties to President Putin, aided the failed efforts of Khalifa Haftar's Libyan National Army to take control of the capital beginning in 2018. Today, Wagner uses its presence in Libya as a “forward base for its activities in the Sahel region, particularly Chad and Niger,” and “has managed to build spheres of influence with local communities and smuggling networks in the southern border regions of Libya, where the group has helped provide weapons and at times extraction technologies for gold or other precious metals.”<sup>213</sup>

Russia has stepped up its military operations in the Mediterranean significantly, often harassing and/or shadowing U.S. and allied vessels. Russia has used its Mediterranean capabilities to support its war against Ukraine. For instance, its Mediterranean Task Force of 10 to 15 vessels served as “a latent naval capability in the eastern Mediterranean,” facilitating a rapid scaling-up of Russia's presence as the invasion [of Ukraine] approached.<sup>214</sup> Some allies believe that, notwithstanding its actions in Ukraine, Russia will remain an active presence in the Mediterranean. According to one assessment:

[T]here will be a major reverberation in the Mediterranean, and we will have to deal with it for a long time. Because this is where Moscow's sources of supply are, because North Africa is an area that the Russians want to destabilise and we must move to prevent this. From the coastal states to the Sahel, Russian activity is known and will manifest itself with greater intensity in the coming years.<sup>215</sup>

**The Balkans.** Security has improved dramatically in the Balkans since the 1990s, but violence based on religious and ethnic differences remains a possibility. These tensions are exacerbated by sluggish economies, high unemployment, political corruption, and the malign influence of Russia and China. As General Cavoli has noted:

Russia continues to fan existing ethnic tensions to impede Euro-Atlantic alignment and integration. The PRC has emerged as an alternative for economic and defense cooperation. PRC loans and investment in the Western Balkans focus on large-scale transportation, energy, and information infrastructure, which contribute further to disruption in the region.<sup>216</sup>

Russia's interests in the Western Balkans are at odds with the desire of the U.S. and its European allies to encourage closer ties between the region and the transatlantic community.

Russia seeks to sever the transatlantic bond forged with the Western Balkans...by sowing instability. Chiefly Russia has sought to inflame preexisting ethnic, historic, and religious tensions. Russian propaganda magnifies this toxic ethnic and religious messaging, fans public disillusionment with the West, as well as institutions inside the Balkan nations, and misinforms the public about Russia's intentions and interests in the region.<sup>217</sup>

Senior members of the Russian government have alleged that NATO enlargement in the Balkans is one of the biggest threats to Russia.<sup>218</sup> NATO now includes four Balkan countries: Albania and Croatia, both of which became member states in April 2009; Montenegro, which became NATO's 29th member state in June 2017; and

North Macedonia, which became NATO's 30th member state in March 2020.

Russia stands accused of being behind a failed plot to break into Montenegro's parliament on election day in 2016, assassinate its former prime minister, and install a pro-Russian government. In May 2019, two Russian nationals who were believed to be the masterminds behind the plot were convicted in absentia along with 12 other individuals for organizing and carrying out the failed coup.

The presiding trial judge, Suzan Mugosa, said on May 9 that [Eduard] Shishmakov and [Vladimir] Popov "pursued a joint decision to make intentional attempts to contribute significantly to the carrying out of the planned criminal actions with the intention to seriously threaten the citizens of Montenegro, to attack the lives and bodies of others, and to seriously threaten and damage Montenegro's basic constitutional, political, and social structures in order to stop Montenegro from joining the NATO alliance."<sup>219</sup>

After Russia annexed Crimea, the Montenegrin government backed European sanctions against Moscow and even implemented its own sanctions. Nevertheless, Russia has significant economic influence in Montenegro and in 2015 sought unsuccessfully to gain access to Montenegrin ports for the Russian navy to refuel and perform maintenance. Russia is the largest investor in Montenegro, and the loss of Russian (as well as Ukrainian) tourists in 2022 hurt the Montenegrin economy.<sup>220</sup> Russian citizens, however, have been able to enter Montenegro overland from Serbia, and as of February 2023, 13,000 Russians had settled in Montenegro since the onset of the war.<sup>221</sup> Montenegro's responses to the war against Ukraine include closing its air space to Russian flights and hosting a significant number of Ukrainian citizens, equivalent to around 5 percent of the population, making it a nation that has accepted one of the largest numbers of Ukrainian refugees per capita.<sup>222</sup>

In March 2022, after Russia's second invasion of Ukraine, the Montenegrin government joined European sanctions on Russia, albeit "without specifying what they were."<sup>223</sup> Montenegro's aid to Ukraine has included ammunition, spare parts for Mi-8 helicopters, and mortars as well as such non-lethal assistance as body armor, helmets, and meals.<sup>224</sup>

Russian cyberattacks against Montenegro include one in August and September 2022 that "crippled online government information platforms and put Montenegro's essential infrastructure, including banking, water and electricity power systems, at high risk."<sup>225</sup> Russia also seeks to sow discord and bolster its influence and narratives by means of intelligence gathering, elite capture, and control of vital media channels, usually through the nation's dominant Serbian media market.<sup>226</sup> In September 2022, Montenegro expelled six Russian spies and "revoked residence permits and banned entry to 28 foreign citizens it accused of spreading 'malign influence' in the interest of unidentified foreign services."<sup>227</sup>

In March 2023, Montenegro's President Milo Djukanovic stated that Western neglect was partly to blame for Russian influence in the region: "The European Union in the past 10 years didn't know what to do with the Western Balkans, but Russia did. It has developed its network in the Balkans."<sup>228</sup> Stopping the region's movement toward Western institutions remains a Russian priority, albeit with mixed results.

For example, North Macedonia's accession to NATO was heavily targeted by Russia, which warned the nation against joining the alliance and sought to derail the Prespa agreement that paved the way for membership by settling long-standing Greek objections to Macedonia's name.<sup>229</sup> In 2018, after North Macedonia was invited to join NATO, Russia's ambassador to the EU warned that "there are errors that have consequences."<sup>230</sup> In July 2018, Greece expelled two Russian diplomats and banned entry by two Russian nationals because of their efforts to undermine the name agreement; Russian actions in Macedonia included disinformation surrounding the vote, websites and social media posts opposing the Prespa agreement, and payments to protestors as well as politicians and organizations that opposed the agreement.<sup>231</sup>

Disinformation and propaganda are important weapons in Russia's campaign to undermine the Western Balkans. In April 2023, the head of the U.S. Department of State's Global Engagement Center noted that the Western Balkans have been "pretty seriously poisoned" by Russian disinformation.<sup>232</sup> Cyberattacks targeted primarily against government institutions are another weapon wielded by Moscow (along with other state actors including

Iran) and have affected nearly every nation in the region over the past year.<sup>233</sup> In one recent cyberattack campaign linked to Iran and Russia, countries like North Macedonia were overwhelmed with fake bomb threats that often targeted hospitals and schools.<sup>234</sup>

Serbia in particular has long served as Russia's foothold in the Balkans.

Russia's influence in the Balkans centers on Serbia, a fellow religiously orthodox nation with whom it enjoys a close economic, political, and military relationship. Serbia and Russia have an agreement in place allowing Russian soldiers to be based at Niš airport in Serbia. The two countries signed a 15-year military cooperation agreement in 2013 that includes sharing of intelligence, officer exchanges, and joint military exercises. In October [2017], Russia gave Serbia six MiG-29 fighters (which while free, will require Serbia to spend \$235 million to have them overhauled). Additionally, Russia plans to supply Serbia with helicopters, T-72 tanks, armored vehicles, and potentially even surface-to-air missile systems.<sup>235</sup>

Serbia has been a notable purchaser of Russian arms including battle tanks, armored personnel carriers, Pantsir air defense systems, helicopters, and anti-tank missiles.<sup>236</sup> In February 2023, Serbia announced its interest in procuring French Rafale jets, partly because sanctions have limited its ability to acquire replacement parts for its fleet of MiGs.<sup>237</sup> Russia also retains the so-called Russian-Serbian Humanitarian Center at Niš, "widely believed to be a Russian spy base" and located "only 58 miles from NATO's Kosovo Force mission based in Pristina."<sup>238</sup>

Russia has used its cultural ties to increase its role in Serbia, positioning itself as the defender of orthodoxy and investing funds in the refurbishing of orthodox churches.

Russia is also active in Bosnia and Herzegovina—specifically, the ethnically Serb Republika Srpska, one of two substate entities inside Bosnia and Herzegovina that emerged from that country's civil war in the 1990s. Moscow knows that exploiting internal ethnic and religious divisions among the country's Bosniak, Croat, and Serb populations is the easiest way to prevent Bosnia and Herzegovina from entering the transatlantic community.

Republika Srpska's current unofficial leader, Milorad Dodik, has long advocated independence for the region and has enjoyed a very close relationship with the Kremlin. President Željka Cvijanović also claims that Republika Srpska will continue to maintain its partnership with Russia.<sup>239</sup> Events in Ukraine, especially the annexation of Crimea, have inspired more separatist rhetoric, but Russia's second invasion of Ukraine allegedly has delayed Republika Srpska's plans to withdraw from Bosnia and Herzegovina's state institutions.<sup>240</sup> In June 2022, the Constitutional Court of Bosnia and Herzegovina ruled unconstitutional the Declaration on Constitutional Principles of Republika Srpska passed by the entity's national assembly in December 2021, which allowed "the establishment of an army at the entity level, the exit from the taxation system, and the establishment of the High Council of Judges and Prosecutors within the entity."<sup>241</sup> Following the decision, Dodik reiterated Republika Srpska's intention to move forward with the declaration despite the court's ruling.<sup>242</sup>

In many ways, Russia's relationship with Republika Srpska is akin to its relationship with Georgia's South Ossetia and Abkhazia occupied regions: more like a relationship with another sovereign state than a relationship with a semiautonomous region inside Bosnia and Herzegovina. When Putin visited Serbia in October 2014, Dodik was treated like a head of state and invited to Belgrade to meet with him. In September 2016, Dodik was again treated like a head of state on a visit to Moscow just days before a referendum that chose January 9 as Republika Srpska's "statehood day," a date filled with religious and ethnic symbolism for the Serbs.<sup>243</sup> In October 2018, just days before elections, Putin hosted Dodik as they watched the Russian Grand Prix in a VIP box.<sup>244</sup>

When Dodik visited Moscow in December 2021, the Kremlin refrained from announcing the meeting ahead of time, but Russian presidential spokesman Dmitry Peskov asserted that "this by no means belittle[d] the importance of the meeting."<sup>245</sup> In September 2022, Dodik again visited Moscow where he reiterated support for Russia's war in Ukraine and discussed with Putin the "construction of a gas pipeline and two gas-fired power plants in Republika Srpska, as well as strengthening cultural cooperation by building a Russian-Serbian Orthodox center."<sup>246</sup> Republika Srpska continues

to host its “statehood day” in defiance of a ruling by Bosnia’s federal constitutional court that both the celebration and the referendum establishing it are illegal.<sup>247</sup>

Russia has reportedly trained a Republika Srpska paramilitary force in Russia at the nearby Niš air base to defend the Serbian entity. It has been reported that “[s]ome of its members fought as mercenaries alongside the Kremlin’s proxy separatists in Ukraine.”<sup>248</sup> Veterans organizations in Russia and Republika Srpska have developed close ties.<sup>249</sup>

Russia has cultivated strong ties with Republika Srpska’s security forces. Russian police take part in exchanges with the security forces, and Russian intelligence officers reportedly teach at the police academy and local university. On April 4, 2018, the Republika Srpska authorities opened a new \$4 million training center “at the site of a former army barracks in Zaluzani, outside Banja Luka” that serves as the headquarters for “anti-terrorist units, logistics units, and a department to combat organized crime.”<sup>250</sup>

Russia also has continued to oppose the recognition of Kosovo as an independent sovereign country<sup>251</sup> and has condemned Kosovo’s creation of its own army. Moscow seeks to derail Kosovo’s efforts to integrate into the West, often by exploiting the Serbian minority’s grievances. In December 2022, Kosovo’s Interior Minister Xhelal Sveccla accused Serbia and Russia of seeking to destabilize Kosovo. Ethnic Serbs living in Kosovar towns erected barricades during protests related to the “arrest of a former Serb police officer working in the Kosovar force” as well as on-again, off-again protests related to the issuance of license plates. Sveccla accused Russia and Serbia of directly orchestrating the protests in an effort to destabilize Kosovo.<sup>252</sup>

The U.S. has invested heavily in the Balkans since the end of the Cold War. Tens of thousands of U.S. servicemembers have served in the Balkans, and the U.S. has spent billions of dollars in aid there, all in the hope of creating a secure and prosperous region that eventually will be part of the transatlantic community.

The foremost external threat to the Balkans is Russia. Russia’s interests in the Balkans are at odds with the U.S. goal of successfully encouraging the region to join the transatlantic community. In the words of North Macedonian President Stevo Pendarovski, “It seems...that the so-called soft

spot in the whole pan-European security architecture right now, apart from Ukraine of course...is the Western Balkans.”<sup>253</sup> Russia seeks to sever the transatlantic bond forged with the Western Balkans by sowing instability and increasing its economic, political, and military footprint in the region.

### Threats to the Commons

The situation with respect to the “commons,” particularly European airspace, has become more unpredictable since Russia’s second invasion of Ukraine.

**Sea.** In May 2018, 17 Russian fighter jets buzzed the HMS *Duncan*, which was serving as the flagship of Standing NATO Maritime Group Two (SNMG2) operating in the Black Sea. Commodore Mike Utley, who was leading SNMG2, stated that the ship was “probably the only maritime asset that has seen a raid of that magnitude in the last 25 years,” and then-British Defense Minister Gavin Williamson described the pilots’ behavior as “brazen Russian hostility.”<sup>254</sup> In January 2021, a Russian Su-27 made a low pass near the USS *Donald Cook*, a guided missile destroyer in the Black Sea,<sup>255</sup> and in June 2021, Russian fighter jets repeatedly harassed a Dutch frigate in the Black Sea.<sup>256</sup>

Russian threats to the maritime theater also include activity near undersea fiber-optic cables. Because these cables “carry 95 percent of daily worldwide communications” in addition to “financial transactions worth over \$10 trillion a day,”<sup>257</sup> any disruption would cause a catastrophic reduction in the flow of capital. Many of these cables run through Irish territorial waters, and NATO’s Intelligence Chief has warned the nation to remain vigilant as Russia could target cables within their waters “in an effort to disrupt western life and gain leverage against those nations that are providing support to Ukraine.”<sup>258</sup> Some analysts have argued that Russian flights and submarine activity off the Irish coast over the past decade are linked to a concerted effort to map undersea cables.<sup>259</sup>

The *Yantar*, a mother ship to two Russian mini submersibles, is often seen near undersea cables, which it is capable of tapping or cutting, and has been observed collecting intelligence near U.S. naval facilities including the submarine base at Kings Bay, Georgia.<sup>260</sup> In September 2021, it was caught loitering in the English Channel.<sup>261</sup> The Russian spy ship *Viktor Leonov* was spotted collecting

intelligence within 30 miles of Groton, Connecticut, in February 2018, and off the coast of South Carolina and Georgia in December 2019.<sup>262</sup> Russia is thought to be behind the April 2021 severing of one of two undersea cables linking Norway's Svalbard archipelago with the mainland.<sup>263</sup> In 2022, similar incidents of fiber-optic sabotage occurred in southern France and the Shetland Islands.<sup>264</sup>

Russia is thought to be behind the September 2022 sabotage of the Nord Stream I and II pipelines. Three Russian naval vessels were observed in the area of the blasts during the time in question, and one vessel is capable of launching mini submarines. Additionally, in May 2023, Denmark's armed forces confirmed that one of their patrol vessels "had taken 26 photos of a Russian submarine rescue vessel named SS-750 near the Nord Stream blast site on September 22 last year, just days before the explosions happened."<sup>265</sup> That same month, reports emerged that NATO strongly suspects that Russia has likely mined additional undersea pipelines and cables in the Baltic Sea.<sup>266</sup> A recent joint report by Danish, Finnish, Norwegian, and Swedish media, which interviewed intelligence sources as part of their investigations, stated that Russia may be mapping "wind farms, gas pipelines, and power and internet cables" in the region for sabotage in a potential future conflict.<sup>267</sup>

**Airspace.** Russia's provocative military flights near U.S. and European airspace have become both more frequent and more aggressive and reckless. In one incident from March 2023, two Russian Su-27 fighters harassed a U.S. MQ-9 Reaper drone operating over international airspace in the Black Sea before one of the jets collided with the Reaper's propeller, forcing it down. U.S. officials noted that "several times before the collision, the Su-27s dumped fuel on, and flew in front of the MQ-9 in a reckless, environmentally unsound and unprofessional manner."<sup>268</sup>

"We know that the intercept was intentional," remarked Chairman of the Joint Chiefs of Staff Mark Milley. "We know that the aggressive behavior was intentional."<sup>269</sup> Russia recovered at least parts of the drone for intelligence-gathering purposes,<sup>270</sup> and U.S. officials announced that steps were taken to "minimize any effort by anybody else to exploit that drone for useful content."<sup>271</sup> After this incident, the U.S. began to fly missions farther south in the Black Sea—a change that, as one U.S. official has stated, "definitely limits our ability to gather intelligence."<sup>272</sup>

In September 2022, a Russian fighter jet attempted to fire a missile at a manned British RC-135 Joint Rivet surveillance aircraft flying off the coast of occupied Crimea in international airspace over the Black Sea. The Russian pilot is reported to have believed mistakenly that he had been given permission to fire, but the "missile did not launch properly." British surveillance flights in the theater were initially suspended before being restarted with fighter escorts.<sup>273</sup>

In May 2023, a Polish Turbolet L-410 flying in international airspace off the Romanian coast in the Black Sea for the EU border agency Frontex was intercepted by a Russian Su-35, which "flew without any radio contact into the operational area designated by Romania, and then performed aggressive and dangerous maneuvers." The Russian pilot's three separate approaches included flying within 16 feet across the front of the Polish plane with the resulting turbulence temporarily causing the Polish crew to lose control of their aircraft.<sup>274</sup> NATO responded by placing its Air Policing units in the region on a higher state of readiness.<sup>275</sup>

The number of Western intercepts of Russian aircraft has increased significantly. In 2021, NATO jets scrambled 290 times to monitor and intercept Russian jets;<sup>276</sup> in 2022, there were almost twice as many: 570.<sup>277</sup> In March 2023, Norway intercepted two Russian IL-38 reconnaissance planes off the coast of its Finnmark region, and in April 2023, Norway scrambled two F-35s to intercept two TU-160 Blackjack strategic bombers, two IL-78 tankers, and three MiG-31 fighters flying in the same region.<sup>278</sup>

There have been several incidents involving Russian military aircraft flying in Europe without using their transponders. In April 2023, for example, two Su-27 fighter jets and an IL-20 reconnaissance aircraft were flying in the Baltic Sea with their transponders switched off.<sup>279</sup> German and British aircraft taking part in NATO Air Policing intercepted the aircraft.

There have been incidents near North American airspace as well. For two straight days in February 2023, Russian aircraft including Tu-95 strategic bombers flew into the Alaska Air Defense Identification Zone (ADIZ). The aircraft, which were intercepted by U.S. fighters, remained in international airspace and did not enter U.S. or Canadian airspace.<sup>280</sup> A similar incident occurred in April. In the years since 2007, when "Russia resumed out of

area Long Range Aviation activity,” NORAD “has seen a yearly average of approximately six to seven intercepts of Russian military aircraft in the ADIZ. These numbers have varied each year from as high as 15 to as low as zero.”<sup>281</sup>

There have been occasional upticks. In April 2021, for example, Lieutenant General David Krumm from Joint Base Elmendorf–Richardson, Alaska, revealed that during the previous year, there had been a large increase in Russian activity and that the U.S. had intercepted more than 60 Russian aircraft in the “most action the Alaska Air Defense Identification Zone—a region spanning 200 nautical miles that reaches past U.S. territory and into international airspace—ha[d] seen since the Soviet Union fell in 1991.”<sup>282</sup>

Russian flights have targeted U.S. ally Japan as well. In March 2022, Japan scrambled a fighter jet to “warn off a helicopter believed to be Russian” that had entered Japanese airspace.<sup>283</sup> In May 2022, when the QUAD<sup>284</sup> was meeting in Tokyo, Japan again scrambled jets to warn off Russian and Chinese warplanes as they neared Japanese airspace.<sup>285</sup> Nor is it only maritime patrol aircraft that fly near Japan. Russian Su-24 attack aircraft, for example, were intercepted in December 2018 and January 2019.<sup>286</sup> In fiscal year (FY) 2022, Japan scrambled jets 150 times to respond to Russian aircraft, a 40 percent decrease from FY 2021 caused largely by Russia’s need for aircraft in its war against Ukraine<sup>287</sup> yet still showing the importance that Russia assigns to such operations.

Russia’s violation of the sovereign airspace of NATO member states is a probing and antagonistic policy that is designed both to test the defense of the alliance and as practice for potential future conflicts. Similarly, Russia’s antagonistic behavior in international waters is a threat to freedom of the seas and, in the Black Sea, is intended to push U.S. and allied aircraft farther away from the theater.

Russia’s reckless aerial activity in the region also remains a threat to civilian aircraft flying in European airspace. That the provocative and hazardous behavior of the Russian armed forces or Russian-sponsored groups poses a threat to civilian aircraft in Europe was amply demonstrated by the July 2014 downing of Malaysia Airlines Flight MH17, killing all 283 passengers and 15 members of the crew, over the skies of southeastern Ukraine.

**Cyberspace.** Russian cyber capabilities are sophisticated, active, and an ongoing threat to economic, social, and political targets around the world. Moscow also appears to be increasingly aggressive in its use of digital techniques, often employing only the slightest veneer of deniability in an effort to intimidate targets and openly defy international norms and organizations.

Russia continues to probe U.S. critical infrastructure. The U.S. Intelligence Community assesses that:

*The Ukraine war was the key factor in Russia’s cyber operations prioritization in 2022. Although its cyber activity surrounding the war fell short of the pace and impact we had expected, Russia will remain a top cyber threat as it refines and employs its espionage, influence, and attack capabilities. Russia views cyber disruptions as a foreign policy lever to shape other countries’ decisions* [and] is particularly focused on improving its ability to target critical infrastructure, including underwater cables and industrial control systems, in the United States as well as in allied and partner countries, because compromising such infrastructure improves and demonstrates its ability to damage infrastructure during a crisis.<sup>288</sup>

Russia continued to conduct cyberattacks on government and private entities in 2020 and 2021. In 2020, Russian hackers “reportedly infiltrated several US government agencies,” including the Defense, Treasury, Commerce, State, Energy, and Homeland Security Departments and the National Nuclear Security Administration, as well as private-sector companies like Microsoft and Intel. SolarWinds, the company whose software was compromised, “told the [Securities and Exchange Commission] that up to 18,000 of its customers installed updates that left them vulnerable to hackers.” It was estimated that “it could take months to identify all [the hackers’] victims and remove whatever spyware they installed.”<sup>289</sup>

In April 2021, the U.S. Treasury sanctioned Russia for the SolarWinds hack. It also sanctioned 32 Russian “entities and individuals” that had carried out “Russian government-directed attempts to influence the 2020 U.S. presidential election, and other acts of disinformation and interference.”<sup>290</sup>

In May 2021, a Russia-based hacking group known as DarkSide launched a cyberattack against Colonial Pipeline, “the operator of one of the nation’s largest fuel pipelines.”<sup>291</sup> The 5,500-mile pipeline, “responsible for carrying fuel from refineries along the Gulf Coast to New Jersey,” was down for six days.<sup>292</sup> Colonial Pipeline paid DarkSide \$90 million in Bitcoin as a ransom payment, but the Department of Justice was able to recover approximately \$2.3 million of that amount a few weeks later.<sup>293</sup> In June 2021, REvil, a Russian cybercriminal group, launched a ransomware attack on JBS, “the world’s largest meat processing company.”<sup>294</sup> JBS was forced to shut down all nine of its U.S. plants for a brief period.<sup>295</sup>

U.S. allies are a frequent target of Russian cyberattacks. Cyberattacks conducted by Russian hackers operating with the connivance of the Russian government are common, with the Baltic nations being particularly frequent targets.<sup>296</sup> A March 2023 Thales report found that “the share of cyber-attacks targeting European Union (EU) countries has risen from 9.8% to 46.5% in the past six months. It’s an increase directly related to the Ukrainian conflict, while 61% of the attacks recorded globally for a year have been of Russian origin.” The report further notes that:

Since February 24, 2022 and the entry of Moscow’s troops into Ukraine, Baltic countries have been the targets of 157 attacks, ahead of Poland (114 incidents), the Nordic countries (95 incidents in Sweden, Norway, Denmark and Finland) and Germany (58 incidents). Less exposed, France has recorded 14 attacks in one year. The latest victim of this wave of incidents has been the website of the Assemblée Nationale (lower house of parliament). It was made inaccessible for several hours on March 27, after an offensive by pro-Russian hackers.<sup>297</sup>

In addition to official intelligence and military cyber assets, Russia employs allied criminal organizations (so-called patriotic hackers) to help it engage in cyber aggression. Using these hackers gives Russia greater resources and can help to shield its true capabilities. “Patriotic hackers” also give the Russian government deniability. In June 2017, for example, Putin stated that “[i]f they (hackers) are patriotically-minded, they start to make their own

contribution to what they believe is the good fight against those who speak badly about Russia. Is that possible? Theoretically it is possible.”<sup>298</sup>

In October 2022, Russian hackers attacked the websites of a dozen airports, knocking some offline (although not affecting airport operations).<sup>299</sup> In April 2023, the European Organisation for the Safety of Air Navigation was hit by a similar cyberattack, which also did not affect flights but did interrupt parts of the organization’s website.<sup>300</sup> U.S. hospitals have been another frequent target of Russian-based hackers.<sup>301</sup>

Russia’s cyber capabilities are advanced and of key importance in realizing the state’s strategic aims. Russia has used cyberattacks to further the reach and effectiveness of its propaganda and disinformation campaigns, and its cyberattacks against election processes in the U.S. and European countries are designed to undermine citizens’ belief in the veracity of electoral outcomes and erode support for democratic institutions in the longer term. Russia also has used cyberattacks to target physical infrastructure including electrical grids, air traffic control, and gas distribution systems.

Cyber is a key component of Russia’s war against Ukraine. In February 2022, “[t]he European Union and its Member States, together with its international partners, strongly condemned the malicious cyber activity conducted by the Russian Federation against Ukraine, which targeted the satellite KA-SAT network, owned by Viasat.”<sup>302</sup> The attack, which began an hour before Russia launched its second invasion of Ukraine, “interrupted service for tens of thousands of broadband customers across Europe,” including in Ukraine, and “reportedly disrupted service for thousands of European wind turbines.”<sup>303</sup>

Ukraine has been a consistent and sustained target of Russian cyberattacks since 2014. The scale of these attacks was magnified in the period leading up to its second invasion in February 2022. Russia sought to leverage overwhelming cyberattacks to advance its military offensive. According to one analyst:

The intent appears to have been to create disorder and overwhelm Ukrainian defenses. Russia sought to disrupt services and install destructive malware on Ukrainian networks included [*sic*] phishing, denial of service, and



taking advantage of software vulnerabilities. One company identified eight different families of destructive software used by Russia in these attacks. The primary targets were Ukrainian government websites, energy and telecom service providers, financial institutions, and media outlets, but the cyberattacks encompassed most critical sectors. This was a wide-ranging attack using the full suite of Russian cyber capabilities to disrupt Ukraine, but it was not a success.

Russia's most significant cyber success so far was the disruption of the Viasat Inc's KA-SAT satellite. This created significant damage that spread beyond Ukraine but ultimately did not provide military advantage to Russia. The attack may have been intended to be part of a larger, coordinated cyberattack that proved unsuccessful, or the Russians may not have expected the rapid restoration of service that was provided with outside assistance.<sup>304</sup>

**Estonia's Foreign Intelligence Service has noted similarly that:**

Russian cyberattacks, like the actions of its armed forces, are likely aimed at wearing down Ukraine's cyber defenders and then finding the weakest link that would help achieve Russia's overall military goal—to wear down Ukraine, damage the international image and credibility of the Ukrainian leadership, reduce aid from allies, and undermine the society's morale. Therefore, a cyberattack need not actually disrupt an information system, as with each attack, investigators have to spend human and time resources to check whether and how extensively the information system has been attacked, how to improve defence, etc.<sup>305</sup>

Russia's cyber capabilities in the context of the war against Ukraine have not yielded the returns Russia had hoped to gain. Cyber defense preparation can play an important role in fending off attacks. While the decisiveness of Russian cyber capabilities should not be overstated, it also should not be underestimated. Moscow and affiliated groups have demonstrated repeatedly that they have both the ability and the willingness to use their cyber

capabilities aggressively to target not only U.S. and allied militaries and governments, but also critical infrastructure and softer targets such as medical systems as a way to sow discord and disruption within Western society.

## Conclusion

Overall, the threat to the U.S. homeland originating from Europe remains low, but the threat to America's interests and allies in the region remains significant, especially given Russia's war in Ukraine. Although Russia has the military capability to harm and (in the case of its nuclear arsenal) to pose an existential threat to the U.S., it has not conclusively demonstrated the intent to do so.

The situation is different with respect to America's allies in the region. Through NATO, the U.S. has pledged to come to the aid of the alliance's European members. Russia continues its efforts to undermine the NATO alliance and presents an existential threat to U.S. allies in Eastern Europe. NATO has been the cornerstone of European security and stability ever since its creation in 1949, and it is therefore essential that the U.S. maintain both the military capability and the political will to fulfill its treaty obligations.

While Russia is not the threat to U.S. global interests that the Soviet Union was during the Cold War, it does pose challenges to a range of America's interests and those of its allies. Russia possesses a full range of capabilities from ground forces to air, naval, space, and cyber. It still maintains the world's largest nuclear arsenal, and although a strike on the U.S. is highly unlikely, the latent potential for such a strike still gives these weapons enough strategic value vis-à-vis America's NATO allies and interests in Europe to ensure their continued relevance.

Russian provocations that are much less serious than any scenario involving a nuclear exchange pose the most serious challenge to American interests, particularly in Central and Eastern Europe, the Arctic, the Balkans, and the South Caucasus. As the Intelligence Community's most recent Annual Threat Assessment states:

***Moscow will continue to employ an array of tools to advance what it sees as its own interests and try to undermine the interests of the United States and its allies. These are likely to be military, security, malign influence, cyber,***

*and intelligence tools, with Russia's economic and energy leverage probably a declining asset. We expect Moscow to insert itself into crises when it sees its interests at stake, the anticipated costs of action are low, it sees an opportunity to capitalize on a power vacuum, or, as in the case of its use of force in Ukraine, it perceives an existential threat in its neighborhood that could destabilize Putin's rule and endanger Russian national security.*<sup>306</sup>

Although Russia has expended much of its arsenal of munitions and has suffered significant losses

in its war against Ukraine, the decision by several countries to continue trading with Russia despite sanctions placed on the country is ensuring a steady flow of funds into Russia's accounts that Putin is using to continue funding his aggression. Russia will therefore continue to be a significant security concern for the U.S., its NATO partners, and other allies.

For these reasons, the *Index of U.S. Military Strength* continues to assess the threat from Russia as "hostile" for level of provocative behavior and "formidable" for level of capability.

## Threats: Russia

|            |            |            |         |              |          |
|------------|------------|------------|---------|--------------|----------|
|            | HOSTILE    | AGGRESSIVE | TESTING | ASSERTIVE    | BENIGN   |
| Behavior   | ✓          |            |         |              |          |
|            | FORMIDABLE | GATHERING  | CAPABLE | ASPIRATIONAL | MARGINAL |
| Capability | ✓          |            |         |              |          |

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# Iran

James Phillips

Radical Islamist terrorism in its many forms remains the most immediate global threat to the safety and security of U.S. citizens at home and abroad, and Iran-supported terrorist groups and proxy militias pose some of the greatest potential threats. The Lebanon-based Hezbollah (Party of God) has a long history of executing terrorist attacks against American targets in the Middle East at Iran's direction, and it could be activated to launch attacks inside the United States in the event of a conflict with Iran. Such state-sponsored terrorist attacks represent the greatest potential Iranian threats to the U.S. homeland, at least until Iran develops a long-range ballistic missile capable of targeting the United States or is able to launch devastating cyberattacks against critical U.S. infrastructure.

## Threats to the Homeland

**Hezbollah Terrorism.** Hezbollah, the radical Lebanon-based Shia revolutionary movement, is a clear terrorist threat to international security. Hezbollah terrorists have murdered Americans, Israelis, Lebanese, Europeans, and citizens of many other nations. Founded by Iran in 1982, this Lebanese group has evolved into a global terrorist network that is strongly backed by the regimes in Iran and Syria. Its political wing has dominated Lebanese politics and is funded by Iran and a dark web of charitable organizations, criminal activities, and front companies.

Hezbollah views terrorism not only as a tool that it can use to advance Iran's revolutionary agenda, but also as part of the "global jihad" and therefore a religious duty. Hezbollah helped to introduce and popularize the tactic of suicide bombings in Lebanon in the 1980s, developed a strong guerrilla

force and a political apparatus in the 1990s, provoked a war with Israel in 2006, intervened in the Syrian civil war after 2011 at Iran's direction, and has become a major destabilizing influence in the ongoing Arab–Israeli conflict. After the terrorist assault on Israel by Hamas on October 7, 2023, Hezbollah launched multiple but limited rocket attacks against Israel's northern border, and the fighting was gradually escalating as this book was being prepared for the printer.

Before September 11, 2001, Hezbollah had murdered more Americans than had been killed by any other terrorist group. Despite al-Qaeda's increased visibility since then, Hezbollah remains bigger, better equipped, better organized, and potentially more dangerous, partly because it enjoys the support of the world's two chief state sponsors of terrorism: Iran and Syria. Hezbollah's demonstrated capabilities led former Deputy Secretary of State Richard Armitage to characterize it as "the A-Team of Terrorists."<sup>1</sup>

Hezbollah has expanded its operations from Lebanon to regional targets in the Middle East and far beyond the region. Today, it is a global terrorist threat that draws financial and logistical support from its Iranian patrons as well as from the Lebanese Shiite diaspora in the Middle East, Europe, Africa, Southeast Asia, North America, and South America. Hezbollah fundraising and equipment procurement cells have been detected and broken up in the United States and Canada, and Europe is believed to contain many more of these cells.

Hezbollah has been involved in numerous terrorist attacks against Americans, including:

- The April 18, 1983, suicide truck bombing of the U.S. embassy in Beirut, which killed 63 people including 17 Americans;

- The October 23, 1983, suicide truck bombing of the Marine barracks at Beirut Airport, which killed 241 Marines and other personnel deployed as part of the multinational peacekeeping force in Lebanon;
- The September 20, 1984, suicide truck bombing of the U.S. embassy annex in Lebanon, which killed 23 people including two Americans; and
- The June 25, 1996, Khobar Towers bombing, which killed 19 American servicemen who were stationed in Saudi Arabia.

In addition:

- Hezbollah operatives were later found to have been responsible for the 1984 murder of American University of Beirut President Malcolm Kerr and the June 14, 1985, murder of U.S. Navy diver Robert Stethem, who was a passenger on TWA Flight 847, which was hijacked and diverted to Beirut International Airport.
- In March 1984, Hezbollah kidnapped William Buckley, the CIA station chief in Beirut, who died in captivity in 1985 after being tortured for more than a year.<sup>2</sup>
- Hezbollah was involved in the kidnapping of several dozen Westerners, including 14 Americans, who were held as hostages in Lebanon in the 1980s. The American hostages eventually became pawns that Iran used as leverage in the secret negotiations that led to the Iran–Contra affair in the mid-1980s.
- Hezbollah kidnapped Colonel William Higgins, a Marine officer serving with the United Nations Truce Supervision Organization in Lebanon, in February 1988 and killed him in 1989.
- Hezbollah has launched numerous attacks outside of the Middle East. It perpetrated the two deadliest terrorist attacks in the history of South America: the March 1992 bombing of the Israeli embassy in Buenos Aires, Argentina, that killed 29 people and the July 1994 bombing of a Jewish community center in Buenos

Aires that killed 96 people. The trial of those who were implicated in the 1994 bombing revealed an extensive Hezbollah presence in Argentina and other countries in South America.

Hezbollah has escalated its terrorist attacks against Israeli targets in recent years as part of Iran’s shadow war against Israel. In 2012, Hezbollah killed five Israeli tourists and a Bulgarian bus driver in a suicide bombing near Burgas, Bulgaria. Hezbollah terrorist plots against Israelis were foiled in Thailand and Cyprus during that same year. Hezbollah and Israel currently are embroiled in an escalating conflict along Israel’s northern border that was triggered by Hamas’s October 7, 2023, terrorist assault on Israel.

Hezbollah deployed personnel to Iraq after the 2003 U.S. intervention to train and assist pro-Iraqi Shia militias that were battling the U.S.-led coalition; it also has deployed personnel in Yemen to train and assist the Iran-backed Houthi rebels. In 2013, Hezbollah admitted that it had deployed several thousand militia members to fight in Syria on behalf of the Assad regime. By 2015, Hezbollah forces had become crucial to the survival of the Assad regime after the Syrian army was hamstrung by casualties, defections, and low morale.

Although Hezbollah operates mostly in the Middle East, it has a global reach and has established a presence inside the United States. Cells in the United States generally are focused on fundraising, including criminal activities like the following:

In a case brought [by the U.S. Department of Justice] against Lebanese Canadian Bank (LCB), two Lebanese money exchange houses, a shipping company, and 30 U.S.-based car dealers, the Government alleged a massive international scheme involving the movement and conversion of criminal proceeds through Lebanon, the United States, and West Africa. The complaint alleged that from 2007 to 2011, at least \$329 million was wired from LCB and other overseas financial institutions to the United States. These funds were used to purchase used cars, which were then shipped to and sold in West Africa. Cash from the car sales, along with the proceeds of narcotics trafficking, were then funneled to Lebanon through Hezbollah-controlled money

laundering channels. Funds were then transferred back to the United States for the purchase of additional cars, repeating the cycle.<sup>3</sup>

Covert Hezbollah cells could morph into other forms and launch terrorist operations inside the United States. Given Hezbollah's close ties to Iran and record of executing terrorist attacks on Tehran's behalf, there is a real danger that Hezbollah terrorist cells could be activated inside the United States in the event of a conflict between Iran and the U.S. or between Iran and Israel.

On June 1, 2017, two naturalized U.S. citizens were arrested and charged with providing material support to Hezbollah and conducting preoperational surveillance of military and law enforcement sites in New York City and at Kennedy Airport, the Panama Canal, and the American and Israeli embassies in Panama.<sup>4</sup> Nicholas Rasmussen, then Director of the National Counterterrorism Center, noted that the June arrests were a "stark reminder" of Hezbollah's global reach and warned that Hezbollah "is determined to give itself a potential homeland option as a critical component of its terrorism playbook," which "is something that those of us in the counterterrorism community take very, very seriously."<sup>5</sup>

On July 9, 2019, a New Jersey man who had served for years as a U.S.-based operative for Hezbollah's terrorism-planning wing, was arrested and charged with providing material support to the terrorist group. Alexei Saab, a 42-year-old Lebanese immigrant and naturalized U.S. citizen, scouted such New York City landmarks as the Statue of Liberty and Empire State Building for possible attacks. When he was indicted in September 2019, he was "at least the third American [to have been] charged since 2017 with being an agent for Hezbollah."<sup>6</sup> In May 2023, Saab was sentenced to 12 years in prison after prosecutors said he was part of a Hezbollah sleeper cell waiting to be activated by Iran and had surveilled possible targets in New York, Boston, and Washington as well as in France, Turkey and the Czech Republic.<sup>7</sup>

In January 2020, after a series of attacks on U.S. military personnel and the U.S. embassy in Iraq provoked a U.S. unmanned aerial vehicle (UAV) strike that killed Iranian General Qassem Soleimani, leader of the Quds Force of Iran's Islamic Revolutionary Guard Corps (IRGC), U.S. intelligence officials

warned about the potential Hezbollah threat to the U.S. homeland.

- The Department of Homeland Security warned in a January 4, 2020, bulletin that "Iran and its partners, such as Hizballah, have demonstrated the intent and capability to conduct operations in the United States."<sup>8</sup>
- Four days later, the U.S. Intelligence Community warned that if Iran decided to carry out a retaliatory attack in the United States, it "could act directly or enlist the cooperation of proxies and partners, such as Lebanese Hezbollah."<sup>9</sup>
- Then, on January 12, Hezbollah leader Hassan Nasrallah publicly threatened U.S. forces in the Middle East: "The U.S. administration and the assassins will pay a heavy price, and they will discover their miscalculation."<sup>10</sup>

Hezbollah also has a long history of cooperation with criminal networks. On May 27, 2020, U.S. prosecutors announced the indictment of a former Venezuelan politician who sought to recruit terrorists from Hezbollah and Hamas to orchestrate attacks against U.S. interests. Adel El Zabayar, a Venezuelan citizen of Syrian descent who is a close associate of Venezuelan President Nicolás Maduro, traveled to the Middle East in 2014 to obtain weapons and recruit members of Hezbollah and Hamas to train at hidden camps in Venezuela. The goal of this "unholy alliance," according to the U.S. Attorney's Office for the Southern District of New York, was to "create a large terrorist cell capable of attacking United States interests on behalf of the Cartel de Los Soles," a criminal organization that "conspired to export literally tons of cocaine into the U.S."<sup>11</sup>

**Iran's Ballistic Missile Threat.** Iran has an extensive missile development program that has received key assistance from North Korea as well as (until the imposition of sanctions by the U.N. Security Council) more limited support from Russia and China. Although the U.S. Intelligence Community assesses that Iran does not have an ICBM capability (an intercontinental ballistic missile with a range of 5,500 kilometers or about 2,900 miles), Tehran has worked diligently to develop such a capability under the guise of its space program. Iran is not likely to develop missiles that can reach the United States

until 2025 at the earliest,<sup>12</sup> but it has launched several satellites with space launch vehicles that use similar technology, which could also be adapted to develop an ICBM capability.<sup>13</sup>

On April 22, 2020, Iran launched a military satellite with a new launch vehicle that included such new features as a light carbon fiber casing and a moving nozzle for flight control that is also used in long-range ballistic missiles—clear evidence that Iran continues to improve its capabilities.<sup>14</sup> Iran claimed on June 6, 2023, that it had developed a hypersonic missile that could maneuver in-flight and evade all anti-missile defenses.<sup>15</sup> Tehran's missile arsenal primarily threatens U.S. bases and allies in the Middle East, but Iran eventually could expand the range of its missiles to include the continental United States. Iran is the only country that is known to have developed missiles with a range of 2,000 kilometers without first having nuclear weapons.<sup>16</sup>

### **Threat of Regional War**

The Middle East region is one of the most complex, lethal, and volatile threat environments faced by the United States and its allies. Iran, Hezbollah, and Iran-supported proxy groups pose actual or potential threats both to America's interests and to those of its allies.

**Iranian Threats in the Middle East.** Iran is led by an anti-Western revolutionary regime that seeks to tilt the regional balance of power in its favor by driving out the U.S. military presence, undermining and overthrowing opposing governments, and establishing its hegemony over the oil-rich Persian Gulf region. It also seeks to radicalize Shiite communities and advance their interests against Sunni rivals. Iran has a long record of sponsoring terrorist attacks against American targets and U.S. allies in the region.

Iran's conventional military forces, although relatively weak by Western standards, are large compared to those of Iran's smaller neighbors. Iran's armed forces remain dependent on major weapons systems and equipment that were imported from the U.S. before the country's 1979 revolution, and Western sanctions have limited the regime's ability to maintain or replace these aging weapons systems, many of which were depleted in the 1980–1988 Iran–Iraq war. Iran also has not been able to import large numbers of modern armor, combat aircraft, longer-range surface-to-surface missiles, or major naval warships.

Tehran, however, has managed to import modern Russian and Chinese air-to-air, air-to-ground, air defense, anti-armor, and anti-ship missiles to upgrade its conventional military and asymmetric forces.<sup>17</sup> It also has developed its capacity to reverse engineer and build its own versions of ballistic missiles, rockets, UAVs, minisubmarines, and other weapon systems. To compensate for its limited capability to project conventional military power, Tehran has focused on building up its asymmetric warfare capabilities, proxy forces, and ballistic missile and cruise missile capabilities. For example, partly because of the limited capabilities of its air force, Iran developed UAVs during the Iran–Iraq war, including at least one armed model that carried up to six RPG-7 rounds in what may have been the world's first use of UAVs in combat.<sup>18</sup>

The July 2015 Iran nuclear agreement—formally known as the Joint Comprehensive Plan of Action (JCPOA)—lifted nuclear-related sanctions on Iran in January 2016, gave Tehran access to about \$100 billion in restricted assets, and allowed Iran to expand its oil and gas exports, the chief source of its state revenues.<sup>19</sup> Relief from the burden of sanctions helped Iran's economy and enabled Iran to enhance its strategic position, military capabilities, and support for surrogate networks and terrorist groups.

In May 2016, Tehran announced that it was increasing its military budget for 2016–2017 to \$19 billion—90 percent more than the previous year's budget.<sup>20</sup> Estimating total defense spending is difficult both because of Tehran's opaque budget process and because spending on some categories, including Iran's ballistic missile program and military intervention in Syria, is hidden. Nevertheless, the International Institute for Strategic Studies (IISS) has estimated that after the Trump Administration withdrew from the nuclear agreement and reimposed sanctions, Iran's defense spending fell from an estimated \$21.9 billion in 2018 to \$17.4 billion in 2019.<sup>21</sup> In 2020, according to the IISS, defense spending declined again to an estimated \$14.1 billion.<sup>22</sup> Although changes in Iran's reporting system in 2020 complicated the comparison of year-to-year data, it was estimated that Iran's defense spending in 2021 increased by a modest 2.4 percent over 2019 levels because of improvements in the economy as Iran adapted to U.S. sanctions and exported more oil to China.<sup>23</sup>

## Iranian Missile Systems: Maximum Ranges



- 2,000 km**  
Shahab 3/Emad-1/Sejjil MRBMs
- 750 km**  
Qiam-1 SRBM
- 700 km**  
Zolfaghar SRBM
- 500 km**  
Shahab 2 SRBM and Fateh-110
- 300 km**  
Shahab 1

**SOURCE:** U.S. Department of Defense, Defense Intelligence Agency, *Iran Military Power: Ensuring Regime Survival and Securing Military Dominance*, 2019, p. 43, [https://www.dia.mil/Portals/110/Images/News/Military\\_Powers\\_Publications/Iran\\_Military\\_Power\\_LR.pdf](https://www.dia.mil/Portals/110/Images/News/Military_Powers_Publications/Iran_Military_Power_LR.pdf) (accessed September 8, 2023).

The 2015 nuclear agreement also enabled Tehran to emerge from diplomatic isolation and strengthen strategic ties with Russia.

- Russian President Vladimir Putin traveled to Iran in November 2015 to meet with Supreme Leader Ayatollah Ali Khamenei and other officials. Both regimes called for enhanced military cooperation, particularly in Syria where both had deployed military forces in support of President Bashar al-Assad's brutal regime.
- During Iranian President Hassan Rouhani's visit to Russia in March 2017, Putin proclaimed his intention to raise bilateral relations to the level of a "strategic partnership."<sup>24</sup>
- On June 9, 2018, during the Shanghai Cooperation Organization (SCO) summit, Putin noted that Iran and Russia were "working well together to settle the Syrian crisis" and promised Rouhani that he would support Iran's entry into the SCO.<sup>25</sup> Membership in the SCO, which Iran subsequently joined in September 2022, has enabled Tehran to escape diplomatic isolation and increase its cooperation with Russia and China.

This growing strategic relationship has strengthened Iran's military capabilities. In April 2016, Tehran announced that Russia had begun deliveries of up to five S-300 Favorit long-range surface-to-air missile systems, which can track as many as 100 aircraft and engage six of them simultaneously at a range of 200 kilometers.<sup>26</sup> The missile system, which was considered a defensive weapon and not included in the U.N. arms embargo on Iran, was deployed and became operational in 2017, giving Iran a "generational improvement in capabilities over its other legacy air defense systems" according to Defense Intelligence Agency Director Lieutenant General Robert Ashley.<sup>27</sup>

In 2016, Iranian Defense Minister Hossein Dehghan traveled to Moscow "to negotiate a series of important weapons deals with Russia" that included the purchase of advanced Sukhoi Su-30 Flanker fighter jets. These warplanes would significantly improve Iran's air defense and long-range strike capabilities, although under the terms of the 2015 Iran nuclear agreement, they could not

be delivered until after the U.N. arms embargo expired in October 2020. It was also reported that Tehran was "close to finalizing a deal for purchase and licensed production of Russia's modern T-90S main battle tank."<sup>28</sup>

In 2019, the Defense Intelligence Agency assessed that Iran was interested in buying Russian Su-30 fighters, Yak-130 trainers, T-90 tanks, S-400 air defense systems, and Bastian coastal defense systems.<sup>29</sup> So far, Russia and Iran have not officially announced any arms deals, but both sides likely prefer to keep arms deals under the table with Tehran quietly providing drones to Moscow and Moscow reportedly agreeing to provide Su-35 fighter jets to Tehran.<sup>30</sup> Moscow may be waiting to see whether the Iran nuclear agreement can be renegotiated, which would enable it to receive payments from Iran after U.S. financial sanctions were lifted.

In January 2022, President Ebrahim Raisi met with President Putin in Moscow. The two agreed to accelerate the construction of Russian nuclear reactors in Bushehr, Iran, but Putin appeared to be lukewarm about the draft of a strategic cooperation agreement that Raisi brought with him.<sup>31</sup> Clearly, Iran needs Russia more than Russia needs Iran.

If Iran should succeed in reviving the lapsed nuclear agreement, Russian-Iranian security cooperation could expand significantly. After the 2015 nuclear agreement, Iran and Russia escalated their strategic cooperation in propping up Syria's embattled Assad regime. Iran's growing military intervention in Syria was partly eclipsed by Russia's military intervention and launching of an air campaign against Assad's enemies in September 2015, but Iran's IRGC and surrogate militia groups have played the leading role in spearheading the ground offensives that have retaken territory from Syrian rebel groups and tilted the military balance in favor of Assad's regime.

- From 2013–2015, "Iran expanded its intervention in Syria to as many as 2,000 Iranian military personnel...including IRGCQF, IRGC ground force, and even some *Artesh* (Iran national military) personnel."<sup>32</sup>
- From 2013–2017, "[t]he IRGC-QF recruited other Shia fighters to operat[e] under Iranian command in Syria...with numbers ranging from 24,000–80,000. These figures include not



only Lebanese Hezbollah fighters but also Iraqi militias and brigades composed of Afghan and Pakistani Shias.”<sup>33</sup>

- In 2018, Iran reportedly “command[ed] up to 80,000 fighters in Syria—all members of Shiite militias and paramilitary forces loyal to the leadership in Iran—and [had] effectively secured a land corridor via Iraq and Syria reaching Hezbollah in Lebanon.”<sup>34</sup>

Working closely with Russia, Iran expanded its military efforts and helped to consolidate a costly victory for the Assad regime. At the height of the fighting in August 2016, Russia temporarily deployed Tu-22M3 bombers and Su-34 strike fighters to an air base at Hamedan in western Iran to strike rebel targets in Syria.<sup>35</sup> After the fall of Aleppo in December 2016, which inflicted a crushing defeat on the armed opposition, Tehran sought to entrench a permanent Iranian military presence in Syria, establishing an elaborate infrastructure of military bases, intelligence centers, UAV airfields, missile sites, and logistical facilities. The IRGC also sought to secure a logistical corridor to enable the movement of heavy equipment, arms, and matériel through Iraq and Syria to bolster Hezbollah in Lebanon.

Iran’s military presence in Syria and continued efforts to provide advanced weapons to Hezbollah through Syria have fueled tensions with Israel, which has launched more than 2,000 air strikes against Hezbollah and Iranian forces in Syria to prevent both the transfer of sophisticated arms and the deployment of Iran-backed militias near Israel’s border. On February 10, 2018, Iranian forces in Syria launched an armed drone that penetrated Israeli airspace before being shot down. Israel responded with air strikes on IRGC facilities in Syria. On May 9, 2018, Iranian forces in Syria launched a salvo of 20 rockets against Israeli military positions in the Golan Heights, provoking Israel to launch ground-to-ground missiles, artillery salvos, and air strikes against all known Iranian bases in Syria.<sup>36</sup>

Although Russia reportedly helped to arrange the withdrawal of Iranian heavy weapons to positions 85 kilometers from Israeli military positions in the Golan Heights, Moscow later “turned a blind eye” to Iranian redeployments and the threat to Israel that deployment of long-range Iranian weapon

systems in Syria represents.<sup>37</sup> On January 13, 2019, Israel launched an air strike against an Iranian arms depot at Damascus International Airport, and the Israeli government revealed that it had launched over 2,000 missiles at various targets in Syria in 2018.<sup>38</sup> Israel remains determined to prevent Iran from establishing forward bases near its borders, and another clash could rapidly escalate into a regional conflict.

By early 2020, Iran reportedly had reduced its military forces in Syria after defeating the rebel military challenge to the Assad regime.<sup>39</sup> However, Iran continues to bolster the strength of its proxies and allies in Syria, particularly Hezbollah, which has embedded itself in the Syrian army’s 1st Corps and is recruiting Syrian fighters near the Golan Heights for future attacks on Israel.<sup>40</sup> In January 2021, Israel launched a series of air strikes against Iranian forces and proxy militias in eastern Syria, reportedly to prevent Iranian ballistic missiles, cruise missiles, and UAVs that have been deployed in western Iraq from being deployed inside Syria.<sup>41</sup>

Israel also has targeted Iranian forces and ballistic missiles inside Iraq.<sup>42</sup> On March 12, 2022, the IRGC launched as many as 12 short-range ballistic missiles at a building near Erbil, Iraq, that it claimed was a base used by Israeli intelligence officers.<sup>43</sup> The IRGC publicly claimed responsibility for the attack—a rare admission that signals the intensification of the shadow war between Iran and Israel.

Iran and Russia also have escalated their strategic cooperation in the Ukraine conflict. Russia’s disastrous February 2022 invasion of Ukraine was a pivotal event that enhanced bilateral strategic, military, and economic ties with Iran. In July 2022, Putin visited Tehran and approved a \$40 billion agreement for Russia’s Gazprom to upgrade Iran’s oil and gas industries. Iranian officials claim that bilateral trade doubled in 2022 and that Russia became Iran’s largest foreign investor.<sup>44</sup>

Bilateral military cooperation also has surged. Iran has provided artillery ammunition and hundreds of drones that Russia has used to bombard Ukrainian targets, and “Moscow and Tehran are moving ahead with plans to build a new factory in Russia that could make at least 6,000 Iranian-designed drones for the war in Ukraine” as part of a \$1 billion agreement.<sup>45</sup> Although the arms pipeline from Iran to Russia is the most immediate concern, particularly if it expands to include Iranian ballistic

### Countries with Iranian Proxy Groups



| Country                 | Militia                   | Estimated Size |
|-------------------------|---------------------------|----------------|
| Afghanistan             | Taliban                   | 30,000–60,000  |
|                         | Fatimiyoun Brigade        | 10,000–15,000  |
| Bahrain                 | Al-Ashtar Brigades        | Unknown        |
| Iraq                    | Kata'ib Hezbollah         | 20,000–30,000  |
|                         | Badr Organization         | 10,000–30,000  |
|                         | Asa'ib Ahl al-Haq         | 5,000–15,000   |
| Lebanon                 | Hezbollah                 | 30,000–45,000  |
| Pakistan                | Zainabiyoun Brigade       | 2,000–5,000    |
| Palestinian Territories | Hamas                     | 25,000         |
|                         | Palestinian Islamic Jihad | 1,000–8,000    |
|                         | Harakat al-Sabireen       | 400–3,000      |
| Syria                   | Quwat al-Ridha            | 3,000–3,500    |
|                         | Baqir Brigade             | 3,000          |
| Yemen                   | Houthi Movement           | 10,000–30,000  |

**SOURCE:** Kali Robinson and Will Merrow, "Iran's Regional Armed Network," Council on Foreign Relations, last updated March 1, 2021, <https://www.cfr.org/article/irans-regional-armed-network> (accessed September 9, 2023).

missiles, the destabilizing implications of Russian arms exports to Iran may well be an even greater long-term concern. Moscow reportedly has agreed to provide Tehran with advanced Su-35 fighter jets and to step up collaboration on military training and weapons development.<sup>46</sup>

**Iran's Proxy Warfare.** Iran has adopted a political warfare strategy that emphasizes irregular warfare, asymmetric tactics, and the extensive use of proxy forces. The Islamic Revolutionary Guard Corps has trained, armed, supported, and collaborated with a wide variety of radical Shia and Sunni militant groups as well as Arab, Palestinian, Kurdish, and Afghan groups that do not share its radical Islamist ideology. The IRGC's elite Quds (Jerusalem) Force has cultivated, trained, armed, and supported numerous proxies, particularly the Lebanon-based Hezbollah; Iraqi Shia militant groups; Palestinian groups such as Hamas and Palestinian Islamic Jihad; and insurgent groups that have fought against the governments of Afghanistan, Bahrain, Egypt, Israel, Iraq, Jordan, Kuwait, Morocco, Saudi Arabia, Turkey, the United Arab Emirates (UAE), and Yemen.

Iran is the world's foremost state sponsor of terrorism and has made extensive efforts to export its radical Shia brand of Islamist revolution. It has established a network of powerful Shia revolutionary groups in Lebanon and Iraq; has cultivated links with Afghan Shia and Taliban militants; and has stirred Shia unrest in Bahrain, Iraq, Lebanon, Saudi Arabia, and Yemen. In recent years, naval forces have regularly intercepted Iranian arms shipments off the coasts of Bahrain and Yemen, and Israel has repeatedly intercepted Iranian arms shipments, including long-range rockets, bound for Palestinian militants in Gaza.

Iranian proxies have targeted U.S. troops in the Middle East in Lebanon in the 1980s, in Saudi Arabia in the 1996 Khobar Towers bombing, in Syria in recent years, and in Iraq since the 2003 overthrow of Saddam Hussein. In April 2019, the Pentagon released an updated estimate of the number of U.S. personnel killed by Iran-backed militias in Iraq, revising the number upward to at least 603 dead between 2003 and 2011. These casualties, about 17 percent of the American death toll in Iraq, "were the result of explosively formed penetrators (EFP), other improvised explosive devices (IED), improvised rocket-assisted munitions (IRAM), rockets, mortars, rocket-propelled grenades (RPG), small-arms,

sniper, and other attacks in Iraq" according to a Pentagon spokesman.<sup>47</sup>

In 2019, Tehran ratcheted up surrogate attacks against U.S. troops in Iraq as part of its aggressive campaign to push back against the U.S. "maximum pressure" sanctions campaign and block the negotiation of a revised nuclear agreement with tighter restrictions. After scores of rocket attacks on Iraqi military bases that hosted U.S. personnel, Iran-controlled Shia militias succeeded in killing an American contractor on December 27, 2019. The ensuing crisis quickly escalated. The U.S. launched air strikes against the Kataib Hezbollah militia that launched the attack; pro-Iranian militia members retaliated by trying to burn down the U.S. embassy in Baghdad; and Washington responded on January 2, 2020, with a drone strike that killed General Qassem Soleimani, leader of the IRGC Quds Force, which was orchestrating the attacks. Iran responded with additional proxy attacks and a ballistic missile attack that failed to kill any U.S. troops stationed at Iraqi military bases.<sup>48</sup>

After a February 15, 2021, rocket attack on an airport in Erbil, Iraq, killed a U.S. contractor, the U.S. retaliated with air strikes against seven targets inside Syria that were controlled by two Iran-backed Iraqi militias—Kataib Hezbollah and Kataib Sayyid al-Shuhada—that were found to have been responsible for the Erbil attack.<sup>49</sup> Attacks by Iran-backed militias, including UAV strikes that pose a growing threat to the 2,500 U.S. troops that train and support Iraqi security forces, have continued.<sup>50</sup>

Iran-backed militias also launched attacks against U.S. military forces in Syria, including an October 20, 2021, strike using at least five suicide drones against the small American garrison at Al Tanf. Because of a timely Israeli warning, there were no casualties, but the U.S. failure to respond forcefully to this attack and scores of others has increased the risks to U.S. troops.<sup>51</sup> Iran and its proxies launched 83 drone and rocket attacks on U.S. forces in Iraq and Syria between January 2021 and March 2023, and U.S. forces responded with only four operations.<sup>52</sup> When Israel responded militarily to Hamas's October 7, 2023, rocket and terrorist attacks inside Israel, Iran-backed militias launched rocket and drone attacks against U.S. forces stationed in Syria and Iraq.<sup>53</sup>

As far back as April 20, 2021, Marine Corps General Kenneth McKenzie, then Commander, United

States Central Command, had already warned that Iran's "small- and medium-sized [unmanned aerial system attacks] proliferating across the [USCENTCOM area of responsibility] present a new and complex threat to our forces and those of our partners and allies" and that "[f]or the first time since the Korean War, we are operating without complete air superiority."<sup>54</sup> Pro-Iranian Iraqi militias also launched a failed drone strike in an attempt to assassinate Iraqi Prime Minister Mustafa al-Kadhimi on November 7, 2021.

**Terrorist Threats from Hezbollah.** Hezbollah is a close ally of, frequent surrogate for, and terrorist subcontractor for Iran's revolutionary Islamist regime. Iran played a crucial role in creating Hezbollah in 1982 as a vehicle that it could use to export its revolution, mobilize Lebanese Shia militants, and develop a terrorist surrogate for attacks on its enemies.

Tehran provides the lion's share of Hezbollah's foreign support: arms, training, logistical support, and money. After the nuclear deal, which offered Tehran substantial relief from sanctions, Tehran increased its aid to Hezbollah, providing as much as \$800 million per year according to Israeli officials.<sup>55</sup> In 2020, the U.S. Department of State estimated that Hezbollah was receiving \$700 million a year from Iran.<sup>56</sup> Tehran has been lavish in stocking Hezbollah's expensive and extensive arsenal of rockets, sophisticated land mines, small arms, ammunition, explosives, anti-ship missiles, anti-aircraft missiles, and even UAVs that Hezbollah can use for aerial surveillance or remotely piloted terrorist attacks. Iranian Revolutionary Guards have trained Hezbollah terrorists in Lebanon's Bekaa Valley and in Iran.

Iran has used Hezbollah as a club to hit not only Israel and Tehran's Western enemies, but many Arab countries as well. Tehran's revolutionary ideology has fueled Iran's hostility to other Middle Eastern governments, many of which it seeks to overthrow and replace with radical allies. During the 1980–1988 Iran–Iraq war, Iran used Hezbollah to launch terrorist attacks against Iraqi targets and Arab states that sided with Iraq. Hezbollah launched numerous terrorist attacks against Saudi Arabia and Kuwait, which extended strong financial support to Iraq's war effort, and participated in several other terrorist operations in Bahrain and the UAE.

Iranian Revolutionary Guards conspired with the Saudi Arabian branch of Hezbollah to conduct

the 1996 Khobar Towers bombing that killed 19 American military personnel. Hezbollah collaborated with the IRGC's Quds Force to destabilize Iraq after the 2003 U.S. occupation and helped to train and advise the Mahdi Army, the radical anti-Western Shiite militia led by militant Iraqi cleric Moqtada al-Sadr, as well as other Iraqi militias. Hezbollah detachments also have cooperated with IRGC forces in Yemen to train and assist the Houthi rebel movement.

Hezbollah threatens the security and stability of the Middle East and Western interests in the Middle East on many fronts. In addition to its murderous actions against Israel, Hezbollah has used violence to impose its radical Islamist agenda and subvert democracy in Lebanon. Some experts mistakenly believed that Hezbollah's participation in the 1992 Lebanese elections and subsequent inclusion in Lebanon's parliament and coalition governments would moderate its behavior, but political inclusion did not lead it to renounce terrorism.

Hezbollah also poses a potential threat to America's NATO allies in Europe. It established a presence inside European countries in the 1980s amid the influx of Lebanese citizens who were seeking to escape Lebanon's civil war and took root among Lebanese Shiite immigrant communities throughout Europe. German intelligence officials have estimated that about 1,250 Hezbollah members and supporters were living in Germany in 2020.<sup>57</sup> Hezbollah also has developed an extensive web of fundraising and logistical support cells throughout Europe.<sup>58</sup>

France and Britain have been the principal European targets of Hezbollah terrorism, partly because both countries opposed Hezbollah's agenda in Lebanon and were perceived as enemies of Iran, Hezbollah's chief patron. Hezbollah has been involved in many terrorist attacks against Europeans, including:

- The October 1983 suicide truck bombing of the French contingent of the multinational peacekeeping force in Lebanon, which killed 58 French soldiers on the same day that the U.S. Marine barracks was bombed;
- The April 1985 bombing of a restaurant near a U.S. base in Madrid, Spain, which killed 18 Spanish citizens;

- A campaign of 13 bombings in France in 1986 that targeted shopping centers and railroad facilities, killing 13 people and wounding more than 250; and
- A March 1989 attempt to assassinate British novelist Salman Rushdie that failed when a bomb exploded prematurely, killing a terrorist in London.

Hezbollah's attacks in Europe trailed off in the 1990s after the group's Iranian sponsors accepted a truce in their bloody 1980–1988 war with Iraq and no longer needed a surrogate to punish states that Tehran perceived as supporting Iraq. However, if Hezbollah decided to revive its aggressive operations in southern Lebanon, European participation in Lebanese peacekeeping operations, which became a lightning rod for Hezbollah terrorist attacks in the 1980s, could again become an issue. Troops from European Union (EU) member states could someday find themselves attacked by Hezbollah with weapons financed by Hezbollah supporters in their home countries.

Hezbollah operatives have been deployed in countries throughout Europe, including Belgium, Bulgaria, Cyprus, France, Germany, and Greece.<sup>59</sup> On April 30, 2020, Germany designated Hezbollah as a terrorist organization after Israel provided intelligence on a stockpile of ammonium nitrate that was stored in a German warehouse and that Hezbollah intended to use to make explosives.

**Mounting Missile Threat.** Iran “possesses the largest and most diverse missile arsenal in the Middle East.”<sup>60</sup> According to the IISS, “Iran’s missile forces currently consist of an estimated 20 different types of solid- and liquid-propellant ballistic missiles in service, as well as at least one cruise missile design, with others reportedly under development.”<sup>61</sup>

Testifying before the Senate Armed Services Committee in March 2022, General McKenzie estimated that Iran has “over 3,000 ballistic missiles of various types, some of which can reach Tel Aviv, to give you an idea of range. None of them can reach Europe yet, but over the last 5 to 7 years...they have invested heavily in their ballistic missile program.”<sup>62</sup>

In June 2017, Iran launched mid-range missiles from its territory against opposition targets in Syria. This was Iran’s first such operational use of

mid-range missiles in almost 30 years, but it was not as successful as Tehran might have hoped. It was reported that three of the five missiles that were launched missed Syria altogether and landed in Iraq and that the remaining two landed in Syria but missed their intended targets by miles.<sup>63</sup>

Iran launched a much more successful attack on September 14, 2019, using at least 18 UAVs and three low-flying cruise missiles to destroy parts of the Saudi oil processing facility at Abqaiq and the oil fields at Khurais. The precisely targeted attack shut down half of Saudi Arabia’s oil production, which was approximately equivalent to 5 percent of global oil production. Although Iran denied responsibility, U.S. intelligence sources identified the launch site as the Ahvaz air base in southwest Iran about 650 kilometers north of Abqaiq.<sup>64</sup>

Iran also used ballistic missiles to attack two Iraqi bases hosting U.S. military personnel on January 8, 2020, in retaliation for an earlier U.S. strike that killed IRGC Quds Force commander General Qassem Soleimani. Of the 16 short-range ballistic missiles launched from three bases inside Iran, 12 reached their targets: 11 struck al-Asad air base in western Iraq, and one struck a base near the northern Iraqi city of Irbil.<sup>65</sup> No U.S. personnel were killed, but more than 100 were later treated for traumatic brain injuries.

The backbone of the Iranian ballistic missile force is the Shahab series of road-mobile surface-to-surface missiles. Based on Soviet-designed Scud missiles, the Shahabs are potentially capable of carrying nuclear, chemical, or biological warheads in addition to conventional high-explosive warheads. Their relative inaccuracy (compared to NATO ballistic missiles) limits their effectiveness unless they are employed against large soft targets like cities. Tehran’s heavy investment in such weapons has fueled speculation that the Iranians intend eventually to replace the conventional warheads on their longer-range missiles with nuclear warheads. As noted, Iran is the only country known to have developed missiles with a range of 2,000 kilometers without already having a nuclear capability.<sup>66</sup>

Iran is not a member of the Missile Technology Control Regime. Instead, it has moved aggressively to acquire, develop, and deploy a wide spectrum of ballistic missile, cruise missile, and space launch capabilities. During the Iran–Iraq war, Iran acquired Soviet-made Scud-B missiles from Libya and later

## Iran's Nuclear Infrastructure



- |  |                                       |                                  |
|--|---------------------------------------|----------------------------------|
| 1 Karaj Agricultural and Medical Center              | 6 Isfahan Nuclear Research Center     | 11 Yellow Cake Production Plant  |
| 2 Tehran Research Reactor                            | 7 Isfahan Uranium Conversion Facility | 12 Darkhovin Nuclear Power Plant |
| 3 Fordow Fuel Enrichment Plant                       | 8 Fuel Manufacturing Plant            | 13 Bushehr Nuclear Power Plant   |
| 4 Arak Heavy-Water Reactor                           | 9 Natanz Fuel Enrichment Plant        | 14 Gchine Mine                   |
| 5 Natanz Underground Centrifuge Manufacturing Center | 10 Saghand Mine                       |                                  |

**NOTE:** Locations are approximate.

**SOURCES:** International Crisis Group, "The Iran Nuclear Deal at Six: Now or Never," *Report No. 230*, January 17, 2022, <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/iran/230-iran-nuclear-deal-six-now-never> (accessed September 9, 2023), and Jon Gambrell, "An Iranian Nuclear Facility Is So Deep Underground that US Airstrikes Likely Couldn't Reach It," *Associated Press*, May 22, 2023, <https://apnews.com/article/iran-nuclear-natanz-uranium-enrichment-underground-project-04dae673fc937af04e62b65dd78db2e0> (accessed September 9, 2023).

acquired North Korean–designed Scud-C and No-dong missiles, which it renamed the Shahab-2 (with an estimated range of 500 kilometers or 310 miles) and Shahab-3 (with an estimated range of 900 kilometers or 560 miles). It now can produce its own variants of these missiles as well as longer-range Ghadr-1 and Qiam missiles.<sup>67</sup>

Iran’s Shahab-3 and Ghadr-1, which is a modified version of the Shahab-3 with a smaller warhead but greater range (about 1,600 kilometers or 1,000 miles), are considered more reliable and advanced than the North Korean No-dong missile from which they are derived. Although early variants of the Shahab-3 missile were relatively inaccurate, “Iran has employed Chinese guidance technology on later variants to significantly improve strike accuracy.”<sup>68</sup> In 2014, then-Defense Intelligence Agency Director Lieutenant General Michael T. Flynn warned that:

Iran can strike targets throughout the region and into Eastern Europe. In addition to its growing missile and rocket inventories, Iran is seeking to enhance [the] lethality and effectiveness of existing systems with improvements in accuracy and warhead designs. Iran is developing the Khalij Fars, an anti-ship ballistic missile which could threaten maritime activity throughout the Persian Gulf and Strait of Hormuz. Iran’s Simorgh space launch vehicle shows the country’s intent to develop intercontinental ballistic missile (ICBM) technology.<sup>69</sup>

Iran’s ballistic missiles threaten U.S. bases and allies from Turkey, Israel, and Egypt to the west to Saudi Arabia and the other Gulf States to the south and former allies Afghanistan and Pakistan to the east. Iran also has become a center for missile proliferation by exporting a wide variety of ballistic missiles, cruise missiles, and rockets to the Assad regime in Syria and such proxy groups as Hezbollah, Hamas, Palestinian Islamic Jihad, the Houthi rebels in Yemen, and Iraqi militias. The Houthi Ansar Allah group has launched hundreds of Iranian-supplied ballistic missiles and armed drones against targets in Saudi Arabia and the UAE, which launched a military campaign against the group in 2015 in support of Yemen’s government. On January 24, 2022, the Houthis launched two ballistic missiles at Al Dhafra air base in the UAE, which

hosts roughly 2,000 U.S. military personnel who took shelter in security bunkers as the incoming missiles were intercepted by Patriot surface-to-air missiles.<sup>70</sup>

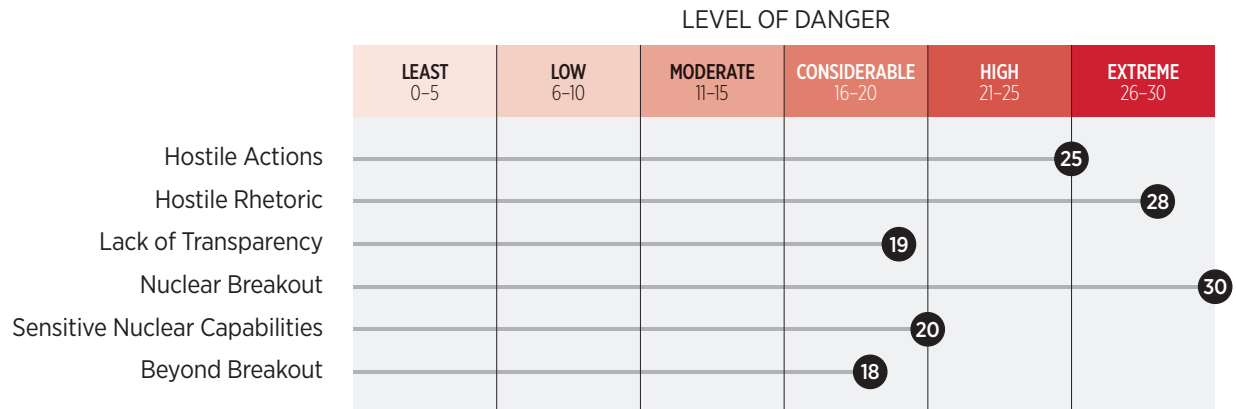
However, it is Israel, which has fought a shadow war with Iran and its terrorist proxies, that is most at risk from an Iranian missile attack. In case the Israeli government had any doubt about Iran’s implacable hostility, the Revolutionary Guard Corps, which controls most of Iran’s strategic missile systems, displayed a message written in Hebrew on the side of one of the Iranian missiles tested in March 2016: “Israel must be wiped off the earth.”<sup>71</sup> The development of nuclear warheads for Iran’s ballistic missiles would significantly degrade Israel’s ability to deter major Iranian attacks (an ability that the existing but not officially acknowledged Israeli nuclear weapons arsenal currently provides).

For Iran’s radical regime, hostility to Israel, which Tehran sometimes calls the “Little Satan,” is second only to hostility to the United States, which the leader of Iran’s 1979 revolution, Ayatollah Khomeini, dubbed the “Great Satan.” However, Iran poses a greater immediate threat to Israel than it does to the United States: Israel is a smaller country, has fewer military capabilities, and is located much closer to Iran and already within range of Iran’s Shahab-3 missiles.

Moreover, the thousands of shorter-range rockets that Iran has provided to Hezbollah in Lebanon and to Hamas and Palestinian Islamic Jihad in Gaza can hit all of Israel. In April 2021, Hamas and Palestinian Islamic Jihad launched more than 4,000 rockets and missiles in an 11-day miniwar with Israel.<sup>72</sup> Israeli air strikes imposed a heavy toll on militant leaders, terrorist infrastructure, and weapons stores that apparently served as an effective deterrent against another round of Hamas rocket terrorism, at least in the short term, but Palestinian Islamic Jihad, a smaller and more militant terrorist group that is tightly controlled by Iran, launched a three-day rocket campaign against Israel in August 2022 and another four-day assault from May 9–13, 2023, in which it fired 1,469 rockets at Israeli civilian areas, killing two people, before Egypt was able to arrange a cease-fire.<sup>73</sup>

Hezbollah, which targeted Israel with more than 4,000 rockets and missiles in the 2006 war, has an arsenal of as many as 150,000 rockets and missiles that it could use to bombard Israel with

## Iran Poses High Level of Danger



**SOURCE:** Institute for Science and International Security, “The Iran Threat Geiger Counter: Moving Toward Extreme Danger,” May 10, 2023, <https://isis-online.org/isis-reports/detail/may-2023-the-iran-threat-geiger-counter-moving-toward-extreme-danger/8> (accessed September 9, 2023).

 heritage.org

an estimated 1,500 strikes per day.<sup>74</sup> According to unconfirmed reports, hundreds of these rockets are armed with chemical warheads.<sup>75</sup> In addition to transferring increasingly accurate and longer-range rockets to Hezbollah, Iran has transferred increasingly advanced drones, expanding Hezbollah’s arsenal to as many as 2,000 drones.<sup>76</sup>

If Iran and Israel were to escalate their shadow war to a full-scale war, which seems increasingly likely in view of the October 2023 Hamas terrorist offensive against Israel, Israel would likely be attacked by Iranian rockets, missiles, and drones launched not only by Iranian military forces, but also by Iranian proxy groups based in Lebanon, Syria, Gaza, Iraq, and Yemen. After Hamas triggered another war with Israel in October 2023, Hezbollah launched (so far) limited but escalating attacks against Israel’s northern border, and Iran’s Houthi proxies launched a salvo of cruise missiles and drones at Israel that were intercepted on October 19 by a U.S. destroyer deployed in the Red Sea.<sup>77</sup>

**Weapons of Mass Destruction.** Tehran has invested tens of billions of dollars since the 1980s in a nuclear weapons program that it sought to conceal within its civilian nuclear power program. It built clandestine but subsequently discovered underground uranium enrichment facilities near Natanz

and Fordow and a heavy-water reactor near Arak that would generate plutonium to give it a second potential route to nuclear weapons.<sup>78</sup>

Before the 2015 nuclear deal, Iran had accumulated enough low-enriched uranium to build eight nuclear bombs (assuming that the uranium was enriched to weapon-grade levels). In November 2015, the Wisconsin Project on Nuclear Arms Control reported that “[b]y using the approximately 9,000 first generation centrifuges operating at its Natanz Fuel Enrichment Plant as of October 2015, Iran could theoretically produce enough weapon-grade uranium to fuel a single nuclear warhead in less than 2 months.”<sup>79</sup>

Clearly, the development of a nuclear bomb would greatly amplify the threat posed by Iran. Even if Iran did not use a nuclear weapon or pass it on to one of its terrorist surrogates to use, the regime could become emboldened to expand its support for terrorism, subversion, and intimidation, presuming that its nuclear arsenal would protect it from retaliation as has been the case with North Korea.

On July 14, 2015, President Barack Obama announced that the United States had reached “a comprehensive, long-term deal with Iran that will prevent it from obtaining a nuclear weapon.”<sup>80</sup> The



short-lived agreement, however, did a much better job of dismantling sanctions against Iran than it did of dismantling Iran's nuclear infrastructure, much of which was allowed to remain functional subject to weak restrictions, some of them only temporary. This flaw led President Donald Trump to withdraw the U.S. from the agreement on May 8, 2018, and reimpose sanctions.<sup>81</sup>

In fact, the agreement did not specify that any of Iran's covertly built facilities would have to be dismantled. The Natanz and Fordow uranium enrichment facilities were allowed to remain in operation, although the latter facility was to be repurposed at least temporarily as a research site. The heavy-water reactor at Arak was also retained with modifications that would reduce its yield of plutonium. All of these facilities, built covertly and housing operations prohibited by multiple U.N. Security Council resolutions, were legitimized by the agreement.

The Iran nuclear agreement marked a risky departure from more than five decades of U.S. nonproliferation efforts under which Washington opposed the spread of sensitive nuclear technologies such as uranium enrichment even to allies. Iran got a better deal on uranium enrichment under the agreement than such U.S. allies as the UAE, South Korea, and Taiwan have received from Washington in the past. In fact, the Obama Administration gave Iran better terms on uranium enrichment than President Gerald Ford's Administration gave the Shah of Iran, a close U.S. ally before the 1979 revolution, who was denied independent reprocessing capabilities.

President Trump's decision to withdraw from the nuclear agreement marked a return to long-standing U.S. nonproliferation policy. Iran, Britain, France, Germany, the EU, China, and Russia sought to salvage the agreement but were unable to offset the strength of U.S. nuclear sanctions that were fully reimposed by November 4, 2018, after a 180-day wind-down period.

Iran initially adopted a policy of "strategic patience," seeking to preserve as much of the agreement's relief from sanctions as it could while hoping to outlast the Trump Administration and deal with a more pliable successor Administration after the 2020 elections. The Trump Administration, however, increased sanctions to unprecedented levels under its "maximum pressure" campaign. On April 8, 2019, it designated Iran's Revolutionary Guards as a foreign terrorist organization. Because the

Revolutionary Guards are extensively involved in Iran's oil, construction, and defense industries, this allowed U.S. sanctions to hit strategic sectors of Iran's economy harder than otherwise might have been the case.<sup>82</sup> On April 22, 2019, Secretary of State Mike Pompeo announced that the Administration would eliminate waivers for Iran's remaining oil exports on May 2 and seek to zero them out entirely.<sup>83</sup>

Although President Trump made it clear that he sought a new agreement on Iran's nuclear program, Tehran refused to return to the negotiating table. Instead, it sought to pressure European states into protecting it from the effects of U.S. sanctions.

On May 8, 2019, Iranian President Rouhani announced that Iran would no longer comply with the 2015 nuclear agreement's restrictions on the size of Iran's stockpiles of enriched uranium and heavy water.<sup>84</sup> Tehran gave the Europeans 60 days to deliver greater sanctions relief, specifically with respect to oil sales and banking transactions, and warned that if the terms of its ultimatum were not met by July 7, 2019, it would incrementally violate the restrictions set by the JCPOA. Since then, Iran has escalated its noncompliance with the agreement in a series of major violations that include breaching the caps on uranium enrichment, research and development of advanced centrifuges, numbers of operating centrifuges, and resuming enrichment at the fortified underground Fordow facility. When announcing the fifth breach in January 2020, Iran stated that its uranium enrichment program no longer faced any restrictions.<sup>85</sup>

By February 2021, Iran had accumulated about 4,390 kilograms of low-enriched uranium and had reduced its estimated breakout time (the time needed to produce enough weapon-grade uranium for one nuclear weapon) to as little as 2.7 months with enough enriched uranium to arm three nuclear weapons within six months if it continued to enrich to higher levels.<sup>86</sup> In April 2021, Iran began to enrich its uranium to 60 percent, a short step away from the weapon-grade level of 90 percent. By June 2022, Iran's breakout time had fallen to zero. It had acquired enough highly enriched uranium to arm a bomb within weeks if further enriched and could acquire enough for five bombs within six months.<sup>87</sup> Gen. Mark Milley, chairman of the Joint Chiefs of Staff, in testimony before the House Appropriations Subcommittee on Defense on March 23, 2023, assessed that: "From the time of an Iranian

decision...Iran could produce fissile material for a nuclear weapon in less than two weeks, and would only take several more months to produce an actual nuclear weapon.”<sup>88</sup>

Although Tehran is not known to have enriched uranium to weapon-grade levels (90 percent) so far, it has enriched a small quantity to nearly 84 percent. Specifically:

[I]n January 2023, Iran made an undeclared change in the operation of two advanced centrifuge cascades at the Fordow Fuel Enrichment Plant (FFEP), followed by the IAEA’s detection of near 84 percent highly enriched uranium (HEU) particles at the cascades, which Iran had declared were enriching only up to 60 percent HEU. Iran’s explanation was that unintended fluctuations occurred.<sup>89</sup>

Iran essentially has become a threshold nuclear power and seeks to leverage that status to gain additional concessions from the U.S. at the multilateral nuclear negotiations in Vienna, Austria. Those talks, begun in April 2021, had been frozen since March 2022, largely because of Iran’s insistence that it gain sanctions relief for the IRGC, which Washington has designated as a foreign terrorist organization. Two days of new “last-gasp talks,” facilitated by representatives from the EU, were attempted in Doha in June 2022 but ended abruptly when disputes about sanctions and Iran’s request for a guarantee that no future U.S. government would seek to withdraw from the agreement could not be resolved.<sup>90</sup> In late 2022, the Biden Administration revived indirect negotiations, ostensibly to reach agreement on a more limited nuclear accord that would also free three American citizens held hostage by Tehran.<sup>91</sup>

Iran’s accelerating nuclear program prompted Israel to step up its covert efforts to sabotage Iran’s nuclear progress. Israel had worked with the U.S. to sabotage Iran’s centrifuge operations with the Stuxnet virus cyberattacks before the 2015 agreement and had unilaterally launched operations to assassinate Iranian nuclear scientists.

Israel paused the assassination campaign during the run-up to the 2015 nuclear agreement but then escalated its covert efforts after the 2018 U.S. withdrawal from the agreement. Iran’s top nuclear scientist, Mohsen Fakhrizadeh, was killed by a remote-controlled machine gun on November 27,

2020.<sup>92</sup> On April 11, 2021, Iran’s uranium enrichment efforts were disrupted by an explosion that cut power and damaged centrifuges at the underground Natanz enrichment facility in an incident that Tehran attributed to Israeli sabotage.<sup>93</sup> Israel also launched sabotage and drone attacks against Iran’s ballistic missile and drone facilities and expanded covert attacks inside Iran to include the May 22, 2022, assassination of Colonel Hassan Sayyad Khodaei, the head of the IRGC unit that targeted Israelis for terrorist attacks. The expanded attacks on non-nuclear targets reportedly were executed as part of Israel’s “Octopus Doctrine” under which Israel seeks to retaliate for Iranian proxy attacks by targeting the head of the octopus rather than its tentacles.<sup>94</sup>

Iran also is a declared chemical weapons power that used chemical weapons in its war against Iraq after the Iraqis conducted chemical attacks. Tehran claims to have destroyed all of its stockpiles of chemical weapons, but it has never fully complied with the Chemical Weapons Convention or declared its holdings.<sup>95</sup> U.S. intelligence agencies have assessed that Iran maintains “the capability to produce chemical warfare (CW) agents and ‘probably’ has the capability to produce some biological warfare agents for offensive purposes, if it made the decision to do so.”<sup>96</sup>

**Iranian Threats to Israel.** In addition to ballistic missile threats from Iran, Israel faces the constant threat of attack from Palestinian, Lebanese, Egyptian, Syrian, and other Arab terrorist groups, including many that are supported by Iran. The threat posed by Arab states, which lost four wars against Israel in 1948, 1956, 1967, and 1973 (Syria and the PLO lost a fifth war in 1982 in Lebanon), has gradually declined. Egypt, Jordan, the UAE, Bahrain, and Morocco have signed peace treaties with Israel, and Iraq, Libya, Syria, and Yemen have been distracted by civil wars. At the same time, however, unconventional military and terrorist threats from an expanding number of substate actors have risen substantially.

Iran has systematically bolstered many of these groups, including some whose ideology it does not necessarily share. Today, for example, Iran’s surrogates Hezbollah and Palestinian Islamic Jihad, along with more distant ally Hamas, are the chief immediate security threats to Israel. After Israel’s May 2000 withdrawal from southern Lebanon and

the September 2000 outbreak of fighting between Israelis and Palestinians, Hezbollah stepped up its support for such Palestinian extremist groups as Hamas, Palestinian Islamic Jihad, the al-Aqsa Martyrs' Brigades, and the Popular Front for the Liberation of Palestine. It also expanded its own operations in the West Bank and Gaza and provided funding for specific attacks launched by other groups. Iranian and Hezbollah support and training enabled Hamas and Palestinian Islamic Jihad to launch their cross-border terrorist attacks against Israel in October 2023.

In July 2006, Hezbollah forces crossed the Lebanese border to kidnap Israeli soldiers inside Israel, igniting a military clash that claimed hundreds of lives and severely damaged the economies on both sides of the border. Hezbollah has since rebuilt its depleted arsenal with help from Iran and Syria and has amassed at least 130,000 rockets and missiles—more than all of the European members of NATO combined.<sup>97</sup> Some of the most dangerous are long-range Iranian-made missiles that are capable of striking cities throughout Israel.<sup>98</sup> In recent years, under cover of the war in Syria, Iran has provided Hezbollah with increasingly sophisticated, accurate, and longer-range weapons as well as guidance kits that upgrade the accuracy of older rockets.<sup>99</sup> Iran and Hezbollah also have established another potential front against Israel in Syria.

Since Israel's withdrawal from the Gaza Strip in 2005, Hamas, Palestinian Islamic Jihad, and other terrorist groups have fired more than 11,000 rockets into Israel during brief wars in 2008–2009, 2012, and 2014.<sup>100</sup> More than 5 million Israelis out of a total population of 8.1 million live within range of rocket attacks from Gaza, although the successful operation of Israel's Iron Dome anti-missile system has greatly mitigated this threat in recent years. In the 2014 Gaza war, Hamas also unveiled a sophisticated tunnel network that it used to infiltrate Israel so that it could launch attacks on Israeli civilians and military personnel.

In early May 2019, Palestinian Islamic Jihad ignited another round of fighting in Gaza during which “Hamas and other groups fired about 700 rockets into Israel on May 4 alone—for comparison, in 2014 they fired fewer than 200 rockets per day.”<sup>101</sup> In May 2021, Hamas and Palestinian Islamic Jihad launched another 11-day war during which they fired about 4,300 rockets at Israel, killing 12 Israelis

while suffering more than 240 Palestinian deaths, including roughly 200 militants, according to Israel.<sup>102</sup> Although Hamas refrained from joining Palestinian Islamic Jihad in launching rocket attacks against Israel in August 2022 and May 2023, Iran has pressed it to participate in a joint operations room with the IRGC, Hezbollah, and Palestinian Islamic Jihad as part of Tehran's efforts to coordinate a multi-front war against Israel.<sup>103</sup> Gaza remains a flash point that could trigger another conflict with little warning, as demonstrated by the surprise attacks launched by Hamas and Palestinian Islamic Jihad in October 2023.

**Threats to Saudi Arabia and Other Members of the Gulf Cooperation Council.** In 1981, Saudi Arabia and the five other Arab Gulf States—Bahrain, Kuwait, Oman, Qatar, and the UAE—formed the Gulf Cooperation Council (GCC) to deter and defend against Iranian aggression. Iran remains the primary external threat to their security. Tehran has supported groups that launched terrorist attacks against Bahrain, Iraq, Kuwait, Saudi Arabia, the United Arab Emirates, and Yemen.

Iran sponsored the Islamic Front for the Liberation of Bahrain, a surrogate group that plotted a failed 1981 coup against Bahrain's ruling Al Khalifa family, the Sunni rulers of the predominantly Shia country. Iran also has long backed Bahraini branches of Hezbollah and the Dawa Party. When Bahrain was engulfed in a wave of Arab Spring protests in 2011, its government charged that Iran again exploited the protests to back the efforts of Shia radicals to overthrow the royal family. Saudi Arabia, fearing that a Shia revolution in Bahrain would incite its own restive Shia minority, led a March 2011 GCC intervention that backed Bahrain's government with about 1,000 Saudi troops and 500 police from the UAE.

Bahrain has repeatedly intercepted shipments of Iranian arms, including sophisticated bombs employing explosively formed penetrators. The government withdrew its ambassador to Tehran when two Bahrainis with ties to the IRGC were arrested after their arms shipment was intercepted off Bahrain's coast in July 2015.

Iranian hard-liners have steadily escalated their pressure on Bahrain. In March 2016, a former IRGC general who is a close adviser to Ayatollah Khomeini stated that “Bahrain is a province of Iran that should be annexed to the Islamic Republic of

Iran.”<sup>104</sup> After Bahrain stripped a senior Shiite cleric, Sheikh Isa Qassim, of his citizenship, General Qassim Suleimani, commander of the IRGC’s Quds Force, threatened to make Bahrain’s royal family “pay the price and disappear.”<sup>105</sup>

Saudi Arabia has criticized Iran for supporting radical Saudi Shiites, intervening in Syria, and supporting Shiite Islamists in Lebanon, Iraq, and Yemen. In January 2016, Saudi Arabia executed a Shiite cleric charged with sparking anti-government protests and cut diplomatic ties with Iran after Iranian mobs responded to the execution by attacking and setting fire to the Saudi embassy in Tehran.<sup>106</sup> A China-brokered détente between Iran and Saudi Arabia in March 2023 cleared the way for the reopening of embassies in their respective capitals, but the Saudi government remains wary of Tehran, which has broken many diplomatic agreements with impunity.

In addition to military threats from Iran, Saudi Arabia and the other GCC states face terrorist threats and possible rebellions by Shia or other disaffected internal groups that are supported by Tehran. Iran has backed Shiite terrorist groups against Saudi Arabia, Bahrain, Iraq, and Kuwait and has supported the Shiite Houthi rebels in Yemen. In March 2015, Saudi Arabia led a 10-country coalition that launched a military campaign against Houthi forces and provided support for ousted Yemeni President Abdu Rabu Mansour Hadi, who took refuge in Saudi Arabia. The Saudi Navy also established a blockade of Yemeni ports to prevent Iran from aiding the rebels.

The Houthis have retaliated by launching Iranian-supplied missiles at military and civilian targets in Saudi Arabia and the UAE, including ballistic missile attacks on airports, Riyadh, and other cities as well as cruise missile strikes. In December 2017, the Houthis launched a cruise missile attack on an unfinished nuclear reactor in Abu Dhabi.

The Houthis also have made extensive use of UAVs and UCAVs (unmanned combat aerial vehicles, or armed drones). A Houthi UCAV attacked a military parade in Yemen in January 2019, killing at least six people including Yemen’s commander of military intelligence, and longer-range UCAVs were used in a coordinated attack on Saudi Arabia’s East–West pipeline on May 14, 2019.<sup>107</sup> The Houthis have employed Iranian Sammad-2 and Sammad-3 UCAVs in strikes against Riyadh, Abu

Dhabi International Airport in the UAE, and other targets.<sup>108</sup>

In addition, the Houthis have steadily increased their attacks. During the first nine months of 2021, Houthi attacks against Saudi Arabia averaged 78 a month, more than double the number from the same period in 2020 when the average was 38 per month.<sup>109</sup> A cease-fire reached in April 2022 to allow negotiations has reduced the scale of the fighting in Yemen, but cross-border attacks could resume if peace negotiations break down.

### Threats to the Commons

Critical American interests—sea, air, space, and cyber—are at stake in the Middle Eastern commons. The U.S. has long provided the security backbone in these areas, and this security has supported the region’s economic development and political stability.

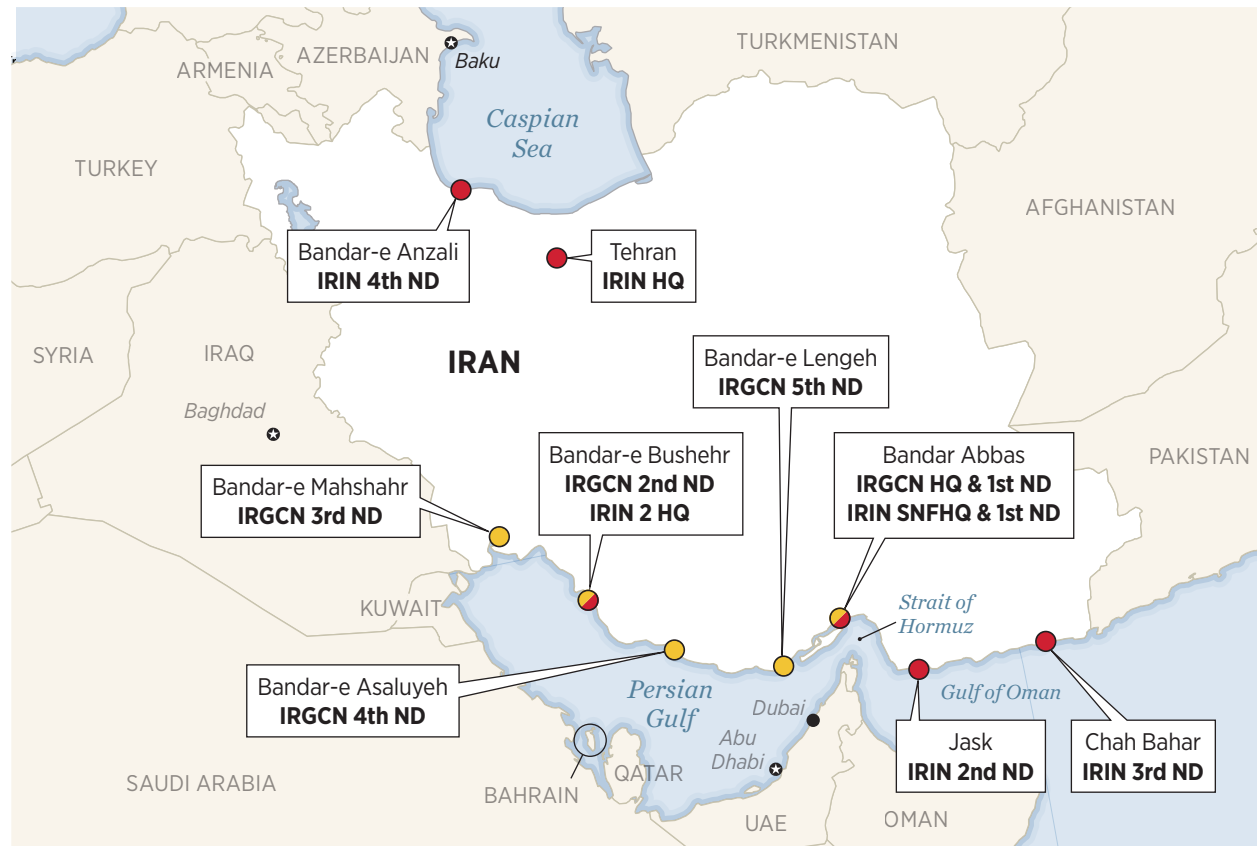
**Sea.** Maintaining the security of the sea lines of communication in the Persian Gulf, Arabian Sea, Red Sea, and Mediterranean Sea is a high priority for strategic, economic, and energy security purposes. “In 2021,” according to the U.S. Energy Administration, “the seven countries in the Persian Gulf produced about 30% of total world crude oil, and they held about 48% of world proved crude oil reserves at the start of 2020.”<sup>110</sup> The Persian Gulf is a crucial source of oil and gas for energy-importing states, particularly China, India, Japan, South Korea, and many European countries. Interstate conflict or terrorist attacks could easily interrupt the flow of that oil.

Bottlenecks such as the Strait of Hormuz, Suez Canal, and Bab el-Mandeb Strait are potential choke points for restricting the flow of oil, international trade, and the deployment of U.S. and allied naval forces. Although the United States has reduced its dependence on oil exports from the Gulf, it still would sustain economic damage in the event of a spike in world oil prices, and many of its European and Asian allies and trading partners import a substantial portion of their oil needs from the region.

The world’s most important maritime choke point and the jugular vein through which most Gulf oil exports flow to Asia and Europe is the Strait of Hormuz. In 2019, the daily oil flow through the strait averaged about 21 million barrels per day (b/d), the equivalent of about 21 percent of global petroleum liquids consumption.<sup>111</sup> The chief potential threat to the free passage of ships through the

## Iranian Naval Headquarters

● Islamic Republic of Iran Navy Headquarters    ● Islamic Revolutionary Guard Corps Navy Headquarters



ND – Naval district

**SOURCE:** U.S. Department of Defense, Defense Intelligence Agency, *Iran Military Power: Ensuring Regime Survival and Securing Military Dominance*, 2019, p. 43, [https://www.dia.mil/Portals/110/Images/News/Military\\_Powers\\_Publications/Iran\\_Military\\_Power\\_LR.pdf](https://www.dia.mil/Portals/110/Images/News/Military_Powers_Publications/Iran_Military_Power_LR.pdf) (accessed September 8, 2023).

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strait is Iran, whose Supreme Leader, Ayatollah Ali Khamenei, proclaimed in 2006 that “[i]f the Americans make a wrong move toward Iran, the shipment of energy will definitely face danger, and the Americans would not be able to protect energy supply in the region.”<sup>112</sup>

Iranian officials often reiterate these threats during periods of heightened tension. For example, the chief of staff of Iran’s army, Major General Mohammad Baqeri, warned on April 28, 2019, that “if our oil does not pass, the oil of others shall not pass

the Strait of Hormuz either.”<sup>113</sup> Less than one month later, Iran began to intensify its intimidation tactics against international shipping near the strait.

On May 12, 2019, four oil tankers were damaged by mysterious explosions off the coast of the UAE in the Gulf of Oman. Then-U.S. National Security Adviser John Bolton stated that it was “naval mines almost certainly from Iran” that caused the damage.<sup>114</sup> On June 13, two more tankers were attacked in the Gulf of Oman. Even though Iranian Revolutionary Guards were filmed removing an unexploded limpet mine

from one of the damaged ships, Tehran continued to deny its involvement in all of the attacks.<sup>115</sup> On June 19, an IRGC surface-to-air missile shot down a U.S. surveillance drone in international air space. The U.S. initially planned to launch retaliatory strikes, but President Trump called off the operation.<sup>116</sup> In September, Iran launched a sophisticated UCAV and cruise missile attack on Saudi oil facilities.

Then, in late 2019, Iranian-controlled Iraqi militias launched a series of rocket attacks on Iraqi bases containing U.S. troops, provoking U.S. retaliatory air strikes against those militias and the January 2020 UCAV strike that killed General Qassem Soleimani. Rocket attacks by Iraqi militias have continued, and tensions in Gulf waters remain high.

On May 10, 2020, a missile launched from an Iranian Navy frigate struck another Iranian naval vessel during a military exercise in the Gulf of Oman, killing at least 19 sailors and wounding 15.<sup>117</sup> The incident raised questions about the competence and training of Iran's naval forces. The June 2, 2021, sinking of the *Kharg*, Iran's largest warship, raised similar questions. The *Kharg*, a naval replenishment ship, caught fire and sank in the Gulf of Oman during a training exercise. Iran sustained another setback when its newest frigate, the *Talayieh*, capsized in its dry dock on December 5, 2021.

However, although lax maintenance and safety practices have caused Iran's military forces to suffer numerous accidents, there also has been speculation that some of the incidents might have resulted from covert Israeli attacks. Israel reportedly has attacked at least 12 Iranian vessels transporting oil, arms, and other cargo to Syria to prop up the Assad regime and Hezbollah.<sup>118</sup> It also has been suspected of triggering the April 6, 2021, explosion that damaged the *Saviz*, a converted cargo ship permanently moored in the Red Sea near the coast of Yemen to collect intelligence and support Iran's Houthi allies.<sup>119</sup> For its part, Iran is suspected of at least two attacks on Israeli-owned cargo ships: one on February 25, 2021, in the Gulf of Oman and another on March 25, 2021, in the Arabian Sea.<sup>120</sup> In February 2023, Israel accused Iran of attacking another Israeli-owned oil tanker in the Arabian Sea.<sup>121</sup> Although its contours remain murky, it is clear that the Iran-Israel shadow war has expanded to include maritime attacks.

Iran has a long history of attacking oil shipments in the Gulf. During the Iran-Iraq war, each

side targeted the other's oil facilities, ports, and oil exports. Iran escalated attacks to include neutral Kuwaiti oil tankers and terminals and clandestinely laid mines in Persian Gulf shipping lanes while its ally Libya clandestinely laid mines in the Red Sea. The United States defeated Iran's tactics by reflagging Kuwaiti oil tankers, clearing the mines, and escorting ships through the Persian Gulf, but several commercial vessels were damaged during the so-called Tanker War from 1984 to 1987.

Iran's demonstrated willingness to disrupt oil traffic through the Persian Gulf to pressure Iraq economically is a red flag to U.S. military planners. During the 1980s Tanker War, Iran's ability to strike at Gulf shipping was limited by its aging and outdated weapons systems and the arms embargo imposed by the U.S. after the 1979 revolution. Since the 1990s, however, Iran has been upgrading its military with new weapons from North Korea, China, and Russia in addition to domestically manufactured weapons.

Since the Iran-Iraq war, Tehran has invested heavily in developing its naval forces, particularly the IRGC Navy, along unconventional lines. Today, Iran boasts an arsenal of Iranian-built missiles based on Russian and Chinese designs that represent significant threats to oil tankers as well as warships. Iran has deployed mobile anti-ship missile batteries along its 1,500-mile Gulf coast and on many of the 17 Iranian-controlled islands in the Gulf in addition to modern anti-ship missiles mounted on fast attack boats, submarines, oil platforms, and vessels disguised as civilian fishing boats. Six of Iran's 17 islands in the Gulf—Forur, Bani Forur, Sirri, and three islands seized from the UAE: Abu Musa, Greater Tunb, and Lesser Tunb—are particularly important because they are located close to the shipping channels that all ships must use near the Strait of Hormuz.

Iran has imported Russian submarines, North Korean minisubmarines, and a wide variety of advanced Chinese anti-ship missiles. It also has a significant stock of Chinese-designed anti-ship cruise missiles, including the older HY-2 Seer-sucker and the more modern CSS-N-4 Sardine and CSS-N-8 Saccade models, and has reverse engineered Chinese missiles to produce its own Ra'ad and Noor anti-ship cruise missiles. More recently, Tehran has produced and deployed more advanced anti-ship cruise missiles, the Nasir and Qadir.<sup>122</sup> Shore-based missiles deployed along Iran's

coast would be augmented by aircraft-delivered laser-guided bombs and missiles as well as by television-guided bombs.

Iran has a large supply of anti-ship mines, including modern mines that are far superior to the simple World War I-style contact mines that it used in the 1980s. In addition to expanding the quantity of its mines from an estimated 1,500 during the Iran–Iraq war to more than 5,000 in 2019, Tehran has increased their quality.<sup>123</sup> It has acquired significant stocks of “smart mines” including versions of the Russian MDM-6; Chinese MC-52; and Chinese EM-11, EM-31, and EM-55 mines.<sup>124</sup> One of Iran’s most lethal mines is the Chinese-designed EM-52 “rocket” mine, which remains stationary on the sea floor and fires a homing rocket when a ship passes overhead.

Iran can deploy mines or torpedoes from its three *Kilo*-class submarines, purchased from Russia and based at Bandar Abbas, Iran’s largest seaport and naval base. These submarines could be difficult to detect for brief periods when running silent and remaining stationary on a shallow bottom just outside the Strait of Hormuz.<sup>125</sup> Iran also could use minisubmarines, helicopters, or small boats disguised as fishing vessels to deploy its mines. Iran’s robust mine warfare capability and the U.S. and allied navies’ limited capacity for counter-mine operations are major challenges to Gulf maritime security.<sup>126</sup>

Iran has developed two separate naval forces. The regular navy takes the lead in the Caspian Sea and outside the Strait of Hormuz in the Gulf of Oman, and the Islamic Revolutionary Guard Corps Navy is Iran’s dominant force inside the Persian Gulf. The IRGC Navy has developed an effective asymmetric naval warfare strategy that could enable it to counter the superior firepower and technology of the U.S. Navy and its GCC allies, at least for a short period. It has adopted swarming tactics using well-armed fast attack boats to launch surprise attacks against larger and more heavily armed naval adversaries.

The commander of the IRGC Navy bragged in 2008 that it had brought guerilla warfare tactics to naval warfare: “We are everywhere and at the same time nowhere.”<sup>127</sup> The IRGC has honed such unconventional tactics as deploying remote-controlled radar decoy boats and boats packed with explosives to confuse defenses and attack adversaries. It also

could deploy naval commandos trained to attack using small boats, minisubmarines, and even Jet Skis as well as underwater demolition teams that could attack offshore oil platforms, moored ships, ports, and other facilities.

On April 28, 2015, the Revolutionary Guard naval force seized the *Maersk Tigris*, a container ship registered in the Marshall Islands, near the Strait of Hormuz. Tehran claimed that it seized the ship because of a previous court ruling ordering the Maersk Line, which charters the ship, to make a payment to settle a dispute with a private Iranian company. The ship was later released after being held for more than a week.<sup>128</sup> Then, on May 14, 2015, the *Alpine Eternity*, a Singapore-flagged oil tanker, was surrounded and attacked by Revolutionary Guard gunboats in the Strait of Hormuz when it refused to be boarded. Iranian authorities alleged that it had damaged an Iranian oil platform in March, but the ship’s owners maintained that it had hit an uncharted submerged structure.<sup>129</sup>

The Revolutionary Guard’s aggressive tactics in using commercial disputes as pretexts for illegal seizures of transiting vessels prompted the U.S. Navy to escort American and British-flagged ships through the Strait of Hormuz for several weeks in May 2015 before tensions eased. Iran again resorted to pirate tactics when it seized two Greek tankers on May 27, 2022, in retaliation for Greece’s seizure of an Iranian oil tanker in April 2022.<sup>130</sup>

In May 2023, the U.S. Navy asserted that Iran had “harassed, attacked or interfered” with 15 commercial ships during the past two years, including two commercial ships hijacked by the IRGC in April and May.<sup>131</sup> After Iran hijacked a third ship in early May, the White House announced that the U.S. Navy would step up patrols in the Strait of Hormuz.<sup>132</sup> On June 4, 2023, IRGC gunboats again harassed a commercial ship in the Strait of Hormuz before warships from the U.S. Navy and the United Kingdom Royal Navy came to its aid.<sup>133</sup> On July 5, 2023, yet another incident was reported involving Iranian gunboats attempting to seize two commercial tankers near the Strait of Hormuz. A U.S. Navy guided missile destroyer responded to a distress call, preventing the seizures.<sup>134</sup>

The July 2015 nuclear agreement did not alter the Revolutionary Guard’s confrontational tactics in the Gulf.<sup>135</sup> IRGC naval forces have challenged U.S. naval forces in a series of incidents. IRGC missile

boats launched rockets within 1,500 yards of the carrier *Harry S. Truman* near the Strait of Hormuz in late December 2015,<sup>136</sup> have flown drones over U.S. warships,<sup>137</sup> and detained and humiliated 10 American sailors in a provocative January 12, 2016, incident.<sup>138</sup> Even though the two U.S. Navy boats carrying the sailors had drifted inadvertently into Iranian territorial waters and had the right of innocent passage, their crews were disarmed, forced onto their knees, filmed, and exploited in propaganda videos.

In 2017, for unknown reasons, Iran temporarily halted the harassment of U.S. Navy ships. According to U.S. Navy reports, Iran instigated 23 “unsafe and/or unprofessional” interactions with U.S. Navy ships in 2015, 35 in 2016, and 14 in the first eight months of 2017 with the last incident occurring on August 14, 2017.<sup>139</sup> The provocations resumed in April 2020 when 11 IRGC Navy gunboats harassed six U.S. Navy vessels that were conducting exercises in the international waters of the North Arabian Gulf.<sup>140</sup> One week later, President Trump warned that U.S. Navy forces were authorized to destroy any Iranian vessels that harassed them. Iran’s naval harassment subsided for a time but resumed in April 2021 when the IRGC Navy staged two incidents, forcing U.S. naval vessels to take evasive action in the first and fire warning shots in the second.<sup>141</sup>

This pattern of provocation has continued unabated during the Biden Administration. According to the U.S. Institute of Peace, “[a]s of December 2022, Iranian ships had harassed or tried to seize U.S. ships at least eight times since Biden took office in January 2021.”<sup>142</sup> The following are two recent examples of this harassment:

**Dec. 5, 2022:** An IRGC Navy patrol boat attempted to blind two U.S. Navy ships, sea base platform ship USS *Lewis B. Puller* and guided-missile destroyer USS *The Sullivans*, using a spotlight at night. The Iranian boat came within 150 yards of the ships in international waters in the Strait of Hormuz. “This dangerous action in international waters is indicative of Iran’s destabilizing activity across the Middle East,” said Col. Joe Buccino, CENTCOM spokesman.

**July 5, 2023:** The Iranian Navy attempted to seize two oil tankers in the Strait of Hormuz. Iran aborted the attempt on the TRF *Moss*, a

Marshall Islands-flagged tanker, after the U.S. Fifth Fleet sent the destroyer USS *McFaul*, a surveillance aircraft, and a drone to the area. A different Iranian ship later attempted to seize the *Richmond Voyager*, a Bahamian-flagged tanker managed by Chevron. It fired on the tanker and left the area as the U.S. Navy arrived. The following day, Iran claimed that the *Richmond Voyager* had hit an Iranian ship and injured five people. Tehran said it had a court order to seize the tanker.<sup>143</sup>

Iran has been accused of spoofing satellite navigation systems to lure foreign ships into its territorial waters so that it can seize them. This may have occurred in 2016 when 10 U.S. sailors were captured near an Iranian island and in 2019 when the tanker *Stena Impero* was seized in the Strait of Hormuz.<sup>144</sup> Iran also may have used a similar technique to divert a U.S. UAV from Afghan airspace to Iran where it was captured and put on display in 2011.

If Tehran were to attack ships transiting the Strait of Hormuz, the United States and its allies have the capacity to counter Iran’s maritime threats and restore the flow of oil exports, but “the effort would likely take some time—days, weeks, or perhaps months—particularly if a large number of Iranian mines need to be cleared from the Gulf.”<sup>145</sup> In May 2019, naval warfare experts estimated that by using its combined coastal missile batteries, mines, submarines, and naval forces, Iran could close the strait for up to four weeks.<sup>146</sup> However, such an aggressive move would be very costly and risky for Tehran. Closing the strait would also block Iran’s oil exports and many of its imports, including imports of food and medicine, and most of Iran’s naval forces, naval bases, and other military assets could be destroyed in the resulting conflict.

In addition to using its own forces, Tehran could use its extensive network of clients in the region to sabotage oil pipelines and other infrastructure or to strike oil tankers in port or at sea. Iranian Revolutionary Guards deployed in Yemen reportedly played a role in the unsuccessful October 9 and 12, 2016, missile attacks launched by Houthi rebels against the USS *Mason*, a U.S. Navy warship, near the Bab el-Mandeb Strait in the Red Sea.<sup>147</sup> The Houthis denied that they launched the missiles, but they did claim responsibility for an October 1, 2016, attack on a UAE naval vessel and the February



2017 suicide boat bombing of a Saudi warship. On January 3, 2022, Houthi naval forces seized a UAE freighter in the Red Sea off Yemen's west coast.

Houthi irregular forces have deployed mines along Yemen's coast, used a remote-controlled boat packed with explosives in an unsuccessful July 2017 attack on the Yemeni port of Mokha, and have launched several unsuccessful naval attacks against ships in the Red Sea. Houthi gunboats also attacked and damaged a Saudi oil tanker near the port of Hodeidah on April 3, 2018.

U.N. investigators have concluded that the Houthis also operate UAVs with a range of up to 1,500 kilometers (930 miles), several of which were used to attack Saudi Arabia's East-West pipeline on May 14, 2019.<sup>148</sup> This attack and attacks on oil tankers in the Gulf of Oman two days earlier were likely a signal from Tehran that it can also disrupt oil shipments outside the Persian Gulf in a crisis.

The Houthis have staged numerous UCAV attacks on Saudi targets along with a cruise missile attack on June 12, 2019, and an attack by 10 ballistic missiles on August 25, 2019.<sup>149</sup> The Houthis also claimed responsibility for the September 14, 2019, attacks on Saudi oil facilities at Abqaiq, but U.S. officials asserted that intelligence reports identified Iran as the staging ground for the attacks.<sup>150</sup> On March 7, 2021, the Houthis launched long-range UAVs and ballistic missiles provided by Iran at Saudi Arabia's Ras Tanura oil shipment facility, which is the world's largest, driving oil prices up to over \$70 per barrel for the first time since the COVID-19 pandemic depressed the global economy.<sup>151</sup>

Although Houthi cross-border attacks largely halted after the United Nations brokered an April 2022 cease-fire in Yemen, attacks could resume if the peace negotiations bog down.

**Air.** The Middle East is particularly vulnerable to attacks on civilian aircraft. Large quantities of arms, including man-portable air defense systems, were looted from arms depots in Libya, Iraq, Syria, and Yemen during their civil wars and could be in the hands of Iranian-supported groups. Iran has provided anti-aircraft missiles to Hezbollah, Iraqi militias, and the Houthi rebels in Yemen. The Houthis also have attacked Saudi airports with ballistic missiles and armed drones, although they may have been targeting nearby military facilities.<sup>152</sup>

Perhaps the greatest Iranian threat to civil aviation would come in the event of a military clash in

the crowded skies over the Persian Gulf. On May 16, 2019, during a period of heightened tensions with Iran, the U.S. Federal Aviation Administration warned commercial airlines that civilian planes risked being targeted by the Iranian military as a result of "miscalculation or misidentification."<sup>153</sup>

Tragically, this warning foreshadowed the January 8, 2020, shooting down of Ukraine International Airlines Flight 752 that killed 176 passengers and crew, most of them Iranians. Several hours earlier, Iran had launched a ballistic missile attack on Iraqi bases hosting U.S. troops, and Iranian officials later admitted that they had kept Tehran's airport open in the hope that the presence of passenger jets could act as a deterrent against an American attack on the airport or a nearby military base.<sup>154</sup>

**Space.** Iran has launched satellites into orbit, but there is no evidence that it has an offensive space capability. Tehran successfully launched three satellites in February 2009, June 2011, and February 2012 using the Safir space launch vehicle, which uses a modified Ghadr-1 missile for its first stage and has a second stage that is based on the obsolete Soviet R-27 submarine-launched ballistic missile.<sup>155</sup> The technology probably was transferred by North Korea, which built its BM-25 missiles using the R-27 as a model.<sup>156</sup> Safir technology could be used to develop long-range ballistic missiles.

In December 2013, Iran claimed that it had "sent a monkey into space for the second time, representing the nation's latest step toward sending humans into space."<sup>157</sup> Tehran also announced in June 2013 that it had established its first space tracking center to monitor objects in "very remote space" and help manage the "activities of satellites."<sup>158</sup> On July 27, 2017, Iran tested a Simorgh (Phoenix) space launch vehicle that it claimed could place a satellite weighing up to 250 kilograms (550 pounds) in an orbit of 500 kilometers (311 miles).<sup>159</sup> The satellite launch failed, as did another Simorgh-boosted satellite launch in January 2019.<sup>160</sup>

In April 2020, Tehran finally discarded the pretense that its space program was dedicated exclusively to peaceful purposes. On April 22, Iran's Revolutionary Guards launched a Noor (Light) satellite into a low Earth orbit from a secret missile base to celebrate the 41st anniversary of the IRGC's founding. The spy satellite's path takes it over North Africa and the central Mediterranean, putting Israel within its potential field of vision approximately

every 90 minutes.<sup>161</sup> General Jay Raymond, Commander, U.S. Space Command, dismissed the satellite as a “tumbling webcam in space,”<sup>162</sup> but Iran’s real achievement was probably the previously unheard-of satellite carrier, the Qased (Messenger), a three-stage system that used both solid and liquid fuel.<sup>163</sup> The technical advances required to launch a satellite are similar to those required to launch an ICBM, and the use of solid fuel could allow Iran to launch a missile more quickly—something that is crucial in an offensive weapon.

On February 2, 2021, Iran’s Defense Ministry announced the successful development of a new satellite launch vehicle, the Zuljanah. The first two stages of the three-stage rocket use solid fuel, and the rocket can be launched from a mobile launch pad—two characteristics that are more suitable for a weapons system than for a satellite launch system.<sup>164</sup> In October 2022, Iran launched a Saman test spacecraft that it claimed could shift satellites between orbits.<sup>165</sup>

In February 2022, a Zuljanah launch vehicle apparently blew up on a launch pad at the Imam Khomeini Spaceport.<sup>166</sup> Despite frequent failures, however, the United States and other countries have criticized Iran’s satellite launches as defying a U.N. Security Council resolution calling on Tehran to undertake no activity related to ballistic missiles that are capable of delivering nuclear weapons.

**Cyber.** Iranian cyber capabilities represent a significant threat to the U.S. and its allies. Iran has developed offensive cyber capabilities as a tool of espionage and sabotage and claims “to possess the ‘fourth largest’ cyber force in the world—a broad network of quasi-official elements, as well as regime-aligned ‘hacktivists,’ who engage in cyber activities broadly consistent with the Islamic Republic’s interests and views.”<sup>167</sup>

The creation of the Iranian Cyber Army in 2009 marked the beginning of a cyber offensive against those whom the Iranian regime regards as enemies. The Ajax Security Team, a hacking group believed to be operating out of Iran, has used malware-based attacks to target U.S. defense organizations and has breached the Navy Marine Corps Intranet.<sup>168</sup> The group also has targeted dissidents within Iran, seeding versions of anti-censorship tools with malware and gathering information about users of those programs.<sup>169</sup> Iran has invested heavily in cyber activity, reportedly spending “over \$1 billion on its cyber capabilities in 2012 alone.”<sup>170</sup>

An April 2015 study released by the American Enterprise Institute reported that hostile Iranian cyber activity had increased significantly since the beginning of 2014 and could threaten U.S. critical infrastructure. The Islamic Revolutionary Guard Corps and Sharif University of Technology are two Iranian institutions that investigators have linked to efforts to infiltrate U.S. computer networks.<sup>171</sup>

Iran allegedly has used cyber weapons to engage in economic warfare, most notably the sophisticated and debilitating “[distributed] denial-of-service (DDoS) attacks against a number of U.S. financial institutions, including the Bank of America, JPMorgan Chase, and Citigroup.”<sup>172</sup> In February 2014, Iran launched a crippling cyberattack against the Sands Casino in Las Vegas, owned by Sheldon Adelson, a leading supporter of Israel and critic of the Iranian regime.<sup>173</sup> In 2012, Tehran was suspected of launching both the Shamoon virus attack on Saudi Aramco, the world’s largest oil-producing company—an attack that destroyed approximately 30,000 computers—and an attack on Qatari natural gas company Rasgas’s computer networks.<sup>174</sup>

Israel has been a major target of Iranian cyberattacks. In 2014, Iranian hackers launched denial-of-service attacks against the infrastructure of the Israel Defense Forces. On April 24, 2020, an Iranian cyberattack targeted the command and control center of Israel’s Water Authority, disrupting operations of Israeli water and sewage facilities. According to an Israeli cyber expert, the operation was “a first-of-its-kind attack and they were not far from inflicting human casualties.”<sup>175</sup> Israel retaliated with a May 9, 2020, cyberattack that disrupted operations at one of Iran’s most important port facilities, the Shahid Rajaei terminal in Bandar Abbas.<sup>176</sup> In September 2020, according to the Israeli cybersecurity company ClearSky, a hacker group linked to Iran targeted “many prominent Israeli organizations.” The group, named MuddyWater, used malware disguised as ransomware that would encrypt files and demand payment but not allow the files to be accessed.<sup>177</sup>

In the fall of 2015, U.S. officials warned of a surge of sophisticated Iranian computer espionage that would include a series of cyberattacks against State Department officials.<sup>178</sup> In March 2016, the Justice Department indicted seven Iranian hackers for penetrating the computer system that controlled a dam in the State of New York.<sup>179</sup> In April 2020,

Iran-linked hackers targeted staff at the World Health Organization and the U.S. pharmaceutical company Gilead Sciences Inc., a leader in developing a treatment for the COVID-19 virus.<sup>180</sup> FBI Director Christopher Wray revealed in a June 1, 2022, speech in Boston that the FBI had thwarted an attempted Iranian government-sponsored cyberattack on Boston Children’s Hospital in the summer of 2021, characterizing Iran’s action as “one of the most despicable cyberattacks I’ve ever seen.”<sup>181</sup>

Iran continued its cyber-assaults on Western targets throughout 2022 and into 2023. In September 2022, Albania accused Iran of attacks against its border control system,<sup>182</sup> and in May 2023, Israel suffered multiple attacks, allegedly from Iranian sources, against companies in its shipping and business logistics sectors.<sup>183</sup>

The growing sophistication of these and other Iranian cyberattacks and Iran’s willingness to use these weapons have led various experts to characterize Iran as one of America’s most cyber-capable opponents. Russia reportedly “has helped Iran become a cyber-power by supplying it with cyber weapons, information, and capabilities. In turn, Iran passed its expertise to its terrorist proxy Hizballah.”<sup>184</sup> Russian cyberwarfare aid reportedly increased after Russian–Iranian strategic cooperation surged following Moscow’s disastrous 2022 invasion of Ukraine, with Russia providing advanced digital-surveillance capabilities that Iran could use for domestic surveillance or foreign espionage.<sup>185</sup> Iranian cyber forces have gone so far as to create fake online personas in order to extract information from U.S. officials through such accounts as LinkedIn, YouTube, Facebook, and Twitter.<sup>186</sup>

Significantly, the FBI sent the following cyber alert to American businesses on May 22, 2018:

The FBI assesses [that] foreign cyber actors operating in the Islamic Republic of Iran could potentially use a range of computer network operations—from scanning networks for potential vulnerabilities to data deletion attacks—against U.S.-based networks in response to the U.S. government’s withdrawal from the Joint Comprehensive Plan of Action (JCPOA).<sup>187</sup>

On November 4, 2020, the U.S. Department of Justice announced that it had seized 27 domain names used by Iran’s IRGC in a global covert

influence campaign.<sup>188</sup> A National Intelligence Council report released on March 16, 2021, assessed that during the 2020 U.S. presidential election:

Iran carried out a multi-pronged covert influence campaign intended to undercut former President Trump’s reelection prospects—though without directly promoting his rivals—undermine public confidence in the electoral process and US institutions, and sow division and exacerbate societal tensions in the US.<sup>189</sup>

Iran’s election influence efforts were primarily focused on sowing discord in the United States and exacerbating societal tensions—including by creating or amplifying social media content that criticized former President Trump—probably because they believed that this advanced Iran’s longstanding objectives and undercut the prospects for the former President’s reelection without provoking retaliation.<sup>190</sup>

In April 2023, Microsoft warned that Iranian hackers had greatly refined their cyberwarfare techniques and were targeting energy and transportation infrastructure inside the United States.<sup>191</sup>

## Conclusion

Iran represents by far the most significant security challenge to the United States, its allies, and its interests in the greater Middle East. Its open hostility to the United States and Israel, sponsorship of terrorist groups, and history of threatening the commons underscore the problem. Today, Iran’s provocations are mostly a concern for the region and America’s allies, friends, and assets there. Iran relies heavily on irregular (to include political) warfare against others in the region, and the number of ballistic missiles fielded by Iran is greater than the number fielded by any of its neighboring countries. The development of its ballistic missiles and potential nuclear capability also make Iran a significant long-term threat to the security of the U.S. homeland.

This *Index* therefore assesses the overall threat from Iran, considering the range of contingencies, as “aggressive” for level of provocative behavior. Iran’s capability score holds at “gathering.”<sup>192</sup>

# Threats: Iran

|          | HOSTILE | AGGRESSIVE | TESTING | ASSERTIVE | BENIGN |
|----------|---------|------------|---------|-----------|--------|
| Behavior |         | ✓          |         |           |        |

|            | FORMIDABLE | GATHERING | CAPABLE | ASPIRATIONAL | MARGINAL |
|------------|------------|-----------|---------|--------------|----------|
| Capability |            | ✓         |         |              |          |

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192. This *Index* scores threat capability as it relates to the vital national interests of the United States and the role and utility of U.S. military forces. Terrorist groups clearly have the ability to conduct attacks using improvised explosive devices (IEDs), firearms, and even hijacked airplanes. The bombing of the Boston Marathon in April 2013, an attempted car bomb attack in New York City's Times Square in May 2010, and al-Qaeda's attacks on September 11, 2001, are stark examples. Often, the U.S. has handled terrorism as a law enforcement and intelligence collection matter, especially within the United States and when it presents a threat to particular U.S. interests in other countries. Compared to the types of threats posed by such states as China or Russia, terrorism is a lesser sort of threat to the security and viability of the U.S. as a global power. However, this *Index* does *not* dismiss the deaths, injuries, and damage that terrorists can inflict on Americans at home and abroad; it places the threat posed by terrorism in context with substantial threats to the U.S. homeland, the potential for major regional conflict, and the potential to deny U.S. access to the global commons. With this in mind, terrorist groups seldom have the physical ability either to accomplish their extreme stated objectives or to present a physical threat that rises to a level that threatens U.S. vital security interests. Of course, terrorist organizations can commit acts of war on a continuing basis, as reflected in their conduct in the war against al-Qaeda and its associates in which the United States has been engaged for more than two decades.



# North Korea

Bruce Klingner

North Korea is a perennial problem in Asia because of the regime’s consistently provocative behavior and enhanced missile, nuclear, and cyber capabilities, all of which pose a threat to the United States and its allies. These actions and capabilities, though not on the same existential scale as the threat posed by China or Russia, threaten to undermine not only regional stability and security, but the American homeland itself.

Pyongyang now has a spectrum of missile systems that threaten both the continental United States and U.S. forces and allies in Asia with nuclear weapons. On assuming power in 2011, Kim Jong-un accelerated nuclear and missile testing and oversaw an expansive diversification of North Korea’s arsenal. He directed the North Korean military to develop a new strategy that would enable North Korea to use “asymmetric capabilities including nuclear weapons and missiles” to “occupy the entire South Korean territory within seven days.”<sup>1</sup> New weapons overcame the shortcomings of their predecessors and now pose a far greater threat to allied forces in spite of advancements in missile defense systems.

## Threats to the Homeland

In 2017, North Korea conducted three successful launches of the Hwasong-14 and Hwasong-15 ICBMs, demonstrating the ability to target the entire continental United States with nuclear weapons. In January 2021, at the Eighth Congress of the Workers Party of Korea (WPK), Kim Jong-un announced an ambitious five-year plan to develop multiple-warhead and solid-fueled ICBMs, hypersonic glide warheads, tactical nuclear weapons, nuclear-powered submarines, military reconnaissance satellites, and a long-range nuclear-powered submarine capable of launching nuclear strategic

weapons while under water.<sup>2</sup> In November 2022, North Korea conducted the first successful test of the massive Hwasong-17, the world’s largest road-mobile ICBM, after two previous failed launches earlier in the year. The Hwasong-17 is assessed to carry three or four nuclear warheads.

In April 2023, the regime successfully launched the three-stage Hwasong-18 solid-fuel ICBM, which also will likely have multiple warheads. North Korea first revealed the Hwasong-18, along with 12 liquid-fueled Hwasong-17 ICBMs, at its February 2023 military parade. Pyongyang tested the first stage of the Hwasong-18 in December 2022 and announced that the missile had a thrust of 140 tons of force,<sup>3</sup> which is greater than any U.S., Russian, or Chinese ICBM.<sup>4</sup> In general, the amount of thrust produced by an engine implies a greater ability to lift a weightier payload or to achieve a longer range. In either case, the extraordinary thrust of the Hwasong-18 implies a payload or thrust advantage over other national missile inventories.

The regime’s ability to produce multiple-warhead ICBMs conceivably could overwhelm the limited missile defenses protecting the American homeland. Currently, the U.S. is defended by only 44 Ground-Based Interceptors in Alaska and California and plans to add an additional 20 by the late 2020s.

North Korea has conducted six nuclear tests, including a test in 2017 of a powerful hydrogen bomb with an explosive yield approximately 10 times the yields of the Hiroshima and Nagasaki atomic bombs of World War II. In 2017, the U.S. Defense Intelligence Agency (DIA) reportedly “estimated [that North Korea had] a stockpile of up to 60 nuclear warheads.”<sup>5</sup> In addition, “[s]ome experts have estimated that North Korea could produce enough

nuclear material for an additional seven warheads per year,”<sup>6</sup> and others have estimated that the number could be as high as 12 per year.<sup>7</sup>

In recent years, North Korea has expanded and refined manufacturing facilities for fissile material, nuclear weapons, missiles, mobile missile launchers, and reentry vehicles. By 2027, according to a RAND Corporation analysis, “North Korea could have 200 nuclear weapons and several dozen intercontinental ballistic missiles (ICBMs) and hundreds of theater missiles for delivering the nuclear weapons.”<sup>8</sup>

In January 2023, Kim Jong-un vowed to “exponentially increase” nuclear weapon production to counter alleged threats from the U.S. and South Korea.<sup>9</sup> In March 2023, Kim was observed with a display of 10 Hwasan-31 tactical nuclear weapons that are compatible with eight different types of delivery systems.<sup>10</sup>

In September 2022, Pyongyang passed a new law that lowered the threshold for its use of nuclear weapons. The regime declared that it would use nuclear weapons “in response to, or *perceived preparations* for, a [U.S. or South Korean] nuclear or *non-nuclear* attack on regime leadership, nuclear command structure, or important strategic targets,”<sup>11</sup> thereby adding to the risk that North Korea might use such weapons in response to U.S.–South Korea defense activities.

Pyongyang has created a new generation of advanced mobile missiles that are more accurate, survivable, and capable of evading allied missile defenses. Its evolving nuclear and missile forces increasingly give the regime the ability to conduct surprise preemptive first-strike, retaliatory second-strike, and battlefield counterforce attacks.

The collapse of the February 2019 U.S.–North Korean summit in Hanoi led Pyongyang to initiate extensive missile testing from 2019–2023.

- In 2019, North Korea conducted 26 missile launches, its highest-ever number of violations of U.N. resolutions in a single year. The regime also unveiled five new short-range missile systems threatening South Korea, including a 400 mm multiple rocket launcher (MRL); the KN-23 maneuverable missile, which is similar to the Russian Iskander; the KN-24 missile, which is similar to the U.S. Army Tactical Missile System (ATACMS); the KN-25 600

mm MRL; and the Pukguksong-3 SLBM. The enhanced accuracy of these systems enables North Korea to accomplish counterforce operations with fewer missiles.

- In 2021, Pyongyang conducted more missile launches, revealing an additional five new missile systems, including a long-range cruise missile, an SLBM, an improved short-range ballistic missile, the first North Korean missiles launched from a train, and the Hwasong-8 hypersonic glide missile.<sup>12</sup>
- In 2022, North Korea launched at least 69 ballistic missiles and eight cruise missiles. It conducted salvo launches of multiple missiles simulating nuclear attacks on South Korean ports, airfields, and hardened military command targets.<sup>13</sup> The regime has launched missiles from road-mobile transporters, railcars, submarines, and underwater from a lake.
- In January 2022, Pyongyang test-launched its second hypersonic missile capable of evasive flight maneuvers. North Korean–released photos show a warhead design that is different from the Hwasong-8 tested the previous year. Both hypersonic missiles have detachable, maneuverable warheads that can fly at lower altitudes than standard ballistic missiles, which follow a more predictable parabolic trajectory. These characteristics make radar tracking more difficult and enable the weapons to evade allied missile defense interceptors.<sup>14</sup>

The KN-18 and KN-21 Scud variants also have maneuverable reentry vehicles, and the KN-23’s flight profile showed evasive characteristics instead of a typical ballistic parabola. The KN-23 was flown at depressed trajectories, potentially between the upper reach of Patriot missiles and below the minimum intercept altitude for Terminal High Altitude Area Defense (THAAD), with a final pull-up maneuver that provides a steep terminal descent.<sup>15</sup> The KN-23 could also be used in a first strike against leadership, hardened command and control, or high-value military targets.

North Korea has successfully tested the Pukguksong-1 (KN-11); Pukguksong-3 (KN-26); and an unidentified SLBM, which could target South Korea



and Japan, potentially with a nuclear warhead. North Korea revealed the Pukguksong-4, Pukguksong-5, and Pukguksong-6 SLBM missiles in its October 2020, January 2021, and April 2022 parades.<sup>16</sup>

In 2023, the U.S. Intelligence Community assessed that “Kim Jong-un is continuing efforts to enhance North Korea’s nuclear and conventional capabilities targeting the United States and its allies which will enable periodic aggressive actions to try to reshape the regional security environment in his favor.”<sup>17</sup>

Since September 2022, North Korea has timed its missile launches and military demonstrations to counter U.S.–South Korea exercises probably to attempt to coerce the United States and South Korea to change their behavior and counteract South Korean President Yoon’s hardline policies toward the North. Pyongyang probably wants the alliance to decrease the pace and scale of the exercises with the ultimate goal of undermining the strength of the alliance.<sup>18</sup>

Pyongyang is seeking to gain tacit acceptance of its violations of United Nations resolutions, and thereby prevent additional punitive measures, through routinization of its missile launches and reliance on Chinese and Russian obstructionism at the U.N. Security Council.<sup>19</sup> By depicting its military provocations as justified responses to resumed U.S.–South Korean military drills, Pyongyang seeks to coerce the allies into curtailing future exercises. Pyongyang has long vowed never to abandon its nuclear arsenal, which it describes as both a “trusted shield” and “treasured sword” for deterrence and preemptive attack against the United States and its allies.<sup>20</sup>

### **Threat of Regional War**

In addition to its nuclear and missile forces, North Korea has approximately a million people in its military and several million more in its reserves. Pyongyang has forward-deployed 70 percent of its ground forces, 60 percent of its naval forces, and 40 percent of its naval forces south of the Pyongyang–Wonsan line. South Korea assesses that “North Korea maintains a readiness posture capable of carrying out a surprise attack [on the South] at any given time.”<sup>21</sup>

North Korea has an extensive quantity of conventional forces, but the majority of their weapons were manufactured from the 1950s to the 1970s and are of low quality. The ground forces have approximately 3,500 tanks, 2,500 armored personnel carriers, 8,600 towed and self-propelled artillery, and 5,500 multiple rocket launchers.<sup>22</sup> North Korea’s tank inventory consists predominantly of 1950s-era and 1960s-era T-55 and T-62 tanks. It also has indigenously produced updated tank variants, but they remain outdated compared to South Korean and U.S. tanks, as do North Korea’s light armored vehicles, artillery, combat helicopters, and other ground force weapons.

North Korea has unveiled some new ground force weapons, including tanks and self-propelled artillery, at military parades in recent years, but it is not likely that significant numbers of these weapons have actually been deployed. Pyongyang has compensated for the large number of aging systems by prioritizing the deployment of strong asymmetric capabilities that include special operations forces, long-range artillery, and a broad array of newly developed missiles, several of which are assessed to be nuclear-capable.

North Korea’s naval and air forces are similarly obsolete and underequipped compared with South Korea’s. The North Korean navy has a limited number of aged surface vessels that have fared badly against South Korean naval forces in skirmishes along the maritime Northern Limit Line in the Yellow Sea. The navy has only two frigates and several hundred corvettes and other small coastal combatants.

Pyongyang has 71 submarines, but only one is a *Gorae*-class that is capable of firing ballistic missiles. The remaining force is composed of *Romeo*-class and *Yugo*-class submarines, both 1960s-vintage, and *Sango-O*-class submarines, which were fielded in the early 1990s.

The North Korean air force consists of 545 older combat aircraft that are no match for modern South Korean and U.S. aircraft. North Korean fighters include vintage Mig-15 *Fagot*, Mig-17 *Fresco*, Mig-19 *Farmer*, Mig-21 *Fishbed*, Mig-23 *Flogger*, and Mig-29 *Foxbat* aircraft.<sup>23</sup> Even the relatively small number of third-generation fighter airplanes are of 1980s design.

In September 2018, the two Koreas signed a Comprehensive Military Agreement to ease

military tension and build confidence. The agreement sought to reduce the danger that inadvertent tactical military clashes along the Demilitarized Zone (DMZ) might escalate to larger strategic conflicts. However, static defensive positions like fixed concrete bunkers and minefields are not threatening and have never been the source of military clashes on the peninsula. The greatest danger arises from the forward, offensively oriented disposition of North Korea's forces and the regime's history of making threats and initiating hostilities. The confidence-building measures implemented to date have not reduced North Korea's tactical or strategic conventional military threat to South Korea and do not represent progress in denuclearization.

Due to a predicted shortfall in 18-year-old conscripts, South Korea initiated a comprehensive defense reform strategy to transform its military into a smaller but more capable force to deal with the North Korean threat. Overall, South Korea's military manpower will be reduced by approximately 25 percent, from 681,000 to a planned goal of 500,000. The South Korean military currently has a total strength of 555,000: 420,000 in the army, 70,000 in the navy, and 65,000 in the air force.<sup>24</sup> Seoul is compensating for decreasing troop levels by procuring advanced fighter and surveillance aircraft, naval platforms, and ground combat vehicles.

### **Threat to the Commons**

Pyongyang has developed an advanced cyber warfare prowess that is surpassed by that of few other nations. Beginning with rudimentary distributed denial-of-service (DDoS) attacks against South Korea, the regime has managed to create a robust and global array of disruptive military, financial, and espionage cyber capabilities.

North Korean leader Kim Jong-un has declared that cyber warfare is a "magic weapon" and an "all-purpose sword that guarantees the North Korean People's Armed Forces ruthless striking capability, along with nuclear weapons and missiles."<sup>25</sup> In the run-up to a crisis or as an alternative to kinetic strikes, the regime could paralyze critical infrastructure systems such as communications, dams, electrical grids, hospitals, nuclear power plants, supply chains, and traffic-control systems. North Korean hackers have targeted railroad companies and airlines, including an automated operating system that controls trains' speed.

Pyongyang could also "engage in economic warfare to steal massive amounts of money or undermine the stability of the international financial system or worldwide markets" and "conduct ransomware attacks on banks to gain money or to disable or destroy computer networks as well as flood the SWIFT [financial messaging] system with fraudulent transactions."<sup>26</sup> Pyongyang has absconded with billions of dollars in money and cyber currency to evade international sanctions and increase its ability to finance its nuclear and missile programs. According to the U.S. Department of Justice, North Korean hacking of virtual currency exchanges and related money laundering "poses a grave threat to the security and integrity of the global financial system."<sup>27</sup>

To the extent that the cyber domain is a "global commons" used by all people and countries, North Korea's investment in and exploitation of cyber warfare capabilities presents a very real threat.

### **Conclusion**

North Korea's nuclear and missile forces represent its greatest military threat. Its naval and air forces would not be expected to last long in a conflict with South Korea and the United States, but they would have to be accounted for in any defense by South Korea. Pyongyang's ground forces are largely equipped with older weapons, but they also are extensive and forward-deployed. Thousands of artillery systems deployed near the demilitarized zone could inflict devastating damage on South Korea, especially Seoul, before allied forces could attrite them.

Greater North Korean nuclear capabilities could undermine the effectiveness of existing allied military plans and exacerbate growing allied concerns about Washington's willingness to risk nuclear attack to defend its allies. A more survivable North Korean nuclear force could lead North Korea to perceive that it has immunity from any international response. Pyongyang could feel emboldened to act even more belligerently and use nuclear threats to coerce Seoul into accepting regime demands. The regime could use threats of nuclear attack to force Tokyo to deny U.S. forces access to Japanese bases, ports, and airfields during a Korean conflict. Pyongyang might also assume that conditions for military action had become favorable if it believed the U.S. extended deterrence guarantee had been undermined.

The increasing rate and diversity of North Korea’s missile launches shows that Pyongyang is making significant progress toward implementing a more capable and flexible nuclear strategy, including preemptive strikes with strategic, tactical, and battlefield nuclear weapons. During a crisis, the

threshold for use of nuclear weapons could therefore be breached more easily.

This *Index* assesses the overall threat from North Korea, considering the range of contingencies, as “testing” for level of provocative behavior and “gathering” for level of capability.

## Threats: North Korea

|            | HOSTILE    | AGGRESSIVE | TESTING | ASSERTIVE    | BENIGN   |
|------------|------------|------------|---------|--------------|----------|
| Behavior   |            |            | ✓       |              |          |
|            | FORMIDABLE | GATHERING  | CAPABLE | ASPIRATIONAL | MARGINAL |
| Capability |            | ✓          |         |              |          |

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# Non-State Actors

James Phillips and Jeff M. Smith

All terrorist groups, no matter what form they may take, have one thing in common: the use of violence to achieve their political objectives, whether those objectives are religious, ethnic, or ideological. In general, terrorist groups operate in a very local context, usually within a specific country or sub-region. Sometimes a terrorist group's objectives extend beyond the internationally recognized borders of a state because its members' identity as a group transcends such legal or geographic boundaries.

Terrorist groups rarely pose a threat to the United States that rises to the threshold used by this *Index*: a substantial threat to the U.S. homeland; the ability to precipitate a war in a region of critical interest to the U.S.; and/or the ability to threaten the free movement of people, goods, or services through the global commons. With the exception of Hezbollah and other Iran-backed groups,<sup>1</sup> those that do meet these criteria are assessed in this section.

## Terrorist Threats to the Homeland from the Middle East and North Africa

Radical Islamist terrorism in its various forms remains a global threat to the safety of America's citizens. Many terrorist groups operate in the Middle East, but those that are inspired by Islamist ideology also operate in Europe, Asia, and Africa.

The primary terrorist groups of concern to the U.S. homeland and to Americans abroad are the Islamic State of Iraq and al-Sham (ISIS) and al-Qaeda. Their threat is amplified when they can exploit areas with weak or nonexistent governance that allows them to establish a secure infrastructure from which to plan, train, equip, and launch attacks.

**Al-Qaeda and Its Affiliates.** Al-Qaeda was founded in 1988 by Arab foreign fighters who flocked to Afghanistan to join the war against Soviet

occupation of that country in the 1980s. With Osama bin Laden appointed emir, al-Qaeda was envisaged as a revolutionary vanguard that would radicalize and recruit Sunni Muslims across the world and lead a global Islamist revolution.<sup>2</sup>

After the September 11, 2001, terrorist attacks on the United States, most of al-Qaeda's leadership fled Afghanistan. Many members of the original cadre have been killed or captured. Osama bin Laden, and other key al-Qaeda leaders have been killed by targeted strikes in Afghanistan, Iran, Iraq, Pakistan, Syria, Yemen, and Somalia. However, some key elements of al-Qaeda's leadership have survived or have been replaced, and al-Qaeda's central leadership remains a potential threat to the U.S. homeland.

Bin Laden's successor as emir, Ayman al-Zawahiri, was forced deeper into seclusion and was killed on July 31, 2022, by two Hellfire missiles launched in a CIA drone strike in Kabul, Afghanistan. At the time, Zawahiri was living in a guesthouse owned by acting Taliban Minister of Interior Sirajuddin Haqqani—a blatant violation of the withdrawal agreement that the Taliban negotiated with the United States.<sup>3</sup> Zawahiri's death is not expected to affect al-Qaeda's daily operations, which have long been controlled by the leaders of the terrorist network's regional affiliates,<sup>4</sup> but it could spark a leadership struggle that weakens al-Qaeda's influence on its far-flung affiliates. It is believed that some al-Qaeda lieutenants are still in the Afghanistan-Pakistan region; others have taken refuge in Iran.<sup>5</sup>

Zawahiri's likely successor, Mohammed Salahuddin Zeidan, is reportedly also based in Iran, where he operates under the nom de guerre Saif al-Adel (Sword of Justice).<sup>6</sup> Like scores of other al-Qaeda members in Iran, Zeidan has experienced imprisonment, some form of house arrest,

and periods of relative freedom to operate inside the country, depending on the state of relations between Iran and al-Qaeda. Although both share common enemies in the United States, Israel, and Sunni Arab regimes, they represent clashing Shia and Sunni Islamist ideologies and pursue conflicting long-term goals in Afghanistan, Iraq, Lebanon, Syria, and Yemen.

Iran's Islamic Revolutionary Guard Corps (IRGC) played an important role in establishing links with al-Qaeda in the early 1990s when Bin Laden was based in Sudan. According to the report of the 9/11 Commission, the IRGC trained al-Qaeda members in camps in Lebanon and in Iran, where they learned to build much bigger bombs. The commission assessed that al-Qaeda may have assisted Iran-backed Saudi Hezbollah terrorists who executed the June 1996 bombing that killed 19 U.S. Air Force personnel at the Khobar Towers residential complex in Saudi Arabia and, noting that "[a]fter 9/11, Iran and Hezbollah wished to conceal any past evidence of cooperation with Sunni terrorists associated with al-Qaeda," concluded that "this topic requires further investigation by the U.S. government."<sup>7</sup>

This long-neglected issue resurfaced in 2020 after *The New York Times* reported that al-Qaeda's second-highest leader, Abdullah Ahmed Abdullah, was killed in the heart of Iran's capital city on August 7, 2020, by Israeli agents at the behest of the United States.<sup>8</sup> Abdullah, who went by the nom de guerre Abu Muhammad al-Masri, had been living in Iran at least since 2003 when he had fled from Afghanistan. He had long been a fixture on the FBI's "most wanted" list for his role in planning the August 7, 1998, bombings of the U.S. embassies in Kenya and Tanzania, which killed 224 people including 12 Americans, and was al-Qaeda's most lethal operation before 9/11. He was gunned down on a street in Tehran by two assassins on a motorcycle on the anniversary of that attack.<sup>9</sup>

On January 12, 2021, then-Secretary of State Mike Pompeo confirmed the *New York Times* report about Abdullah's death and warned that Iran had become the "new Afghanistan."<sup>10</sup> He also announced sanctions on two al-Qaeda leaders who continue to operate inside Iran.

Al-Qaeda also dispersed its fighters further afield, allowing for the development of regional affiliates that shared the long-term goals of al-Qaeda's

general command and largely remained loyal to it. These affiliates have enjoyed some success in exploiting local conflicts. In particular, the Arab Spring uprisings that began in 2011 enabled al-Qaeda to take advantage of failed or failing states in Iraq, Libya, Mali, Syria, and Yemen to advance its revolutionary agenda. It is through these affiliates that al-Qaeda is able to project regional strength most effectively.

*Yemen.* Yemen has long been a bastion of support for militant Islamism. Yemenis made up a disproportionate number of the estimated 25,000 foreign Muslims that fought in the Afghan jihad against the Soviet Union in the 1980s. After that conflict ended, Yemen also attracted Westerners into the country to carry out terrorist operations there. In 1998, several British citizens were jailed for planning to bomb Western targets, including hotels and a church.<sup>11</sup>

Al-Qaeda's first terrorist attack against Americans occurred in Yemen in December 1992 when a bomb was detonated in a hotel used by U.S. military personnel. In October 2000, in a much deadlier operation, al-Qaeda terrorists used a boat filled with explosives to attack the USS *Cole* in the port of Aden, killing 17 American sailors.<sup>12</sup> The first U.S. drone strike outside Afghanistan after 9/11 also took place in Yemen and targeted those who were connected to the attack on the *Cole*.<sup>13</sup>

After 9/11 and following crackdowns in other countries, Yemen became increasingly important to al-Qaeda as a base of operations. In September 2008, al-Qaeda launched an attack on the U.S. embassy in Yemen that killed 19 people, including an American woman. Yemen became still more important to al-Qaeda in January 2009 when al-Qaeda members who had been pushed out of Saudi Arabia merged with the Yemeni branch to form Al-Qaeda in the Arabian Peninsula (AQAP). This affiliate quickly emerged as one of the leading terrorist threats to the U.S. In 2010, CIA analysts assessed that AQAP posed a more urgent threat to U.S. security than the al-Qaeda general command based in Afghanistan/Pakistan.<sup>14</sup>

Much of this threat centered initially on AQAP's Anwar al-Awlaki, a charismatic American-born Yemeni cleric who directed several terrorist attacks on U.S. targets before being killed in a drone air strike in September 2011. Awlaki had an operational role in the plot executed by Umar Farouk Abdulmutallab, the failed suicide bomber who sought to destroy an



airliner bound for Detroit on Christmas Day 2009.<sup>15</sup> He was also tied to plots to poison food and water supplies, as well as to launch ricin and cyanide attacks,<sup>16</sup> and is suspected of involvement in the November 2010 plot to dispatch parcel bombs to the U.S. in cargo planes. Additionally, Awlaki reportedly was a key influence on Major Nidal Hassan, the U.S. Army psychiatrist who perpetrated the 2009 Fort Hood, Texas, shootings that killed 13 soldiers.<sup>17</sup>

Since Awlaki's death, the number of AQAP-sanctioned external operations in the West has diminished.<sup>18</sup> However, his videos on the Internet have continued to radicalize and recruit young Muslims, including the perpetrators of the April 2013 Boston Marathon bombing that killed three people.<sup>19</sup>

AQAP's threat to Western security, although seemingly reduced to some extent by Awlaki's death, remains persistent. Another attempt to carry out a bombing of Western aviation using explosives concealed in an operative's underwear was thwarted by a U.S.–Saudi intelligence operation in May 2012.<sup>20</sup> In August 2013, U.S. interception of al-Qaeda communications led to the closure of 19 U.S. embassies and consulates across the Middle East and Africa because of indications that AQAP was planning a massive attack.<sup>21</sup> In January 2015, two AQAP-trained terrorists murdered staff members and nearby police at *Charlie Hebdo* magazine in Paris.<sup>22</sup> In 2017, aviation was targeted once again by a plan to conceal bombs in laptop batteries.<sup>23</sup>

AQAP launched another successful attack inside the United States on December 6, 2019, when a radicalized Saudi Royal Air Force officer being trained at Naval Air Station Pensacola in Florida killed three U.S. Navy sailors and wounded eight other Americans in a shooting attack. The FBI later assessed that the shooter, Mohammed Saeed Al-Shamrani, had been radicalized by 2015 and was influenced by Awlaki's propaganda.<sup>24</sup>

Much of AQAP's activity has focused on exploiting the chaos that stemmed from the Arab Spring in Yemen. AQAP acquired a significant amount of territory in 2011 and established governance in the country's South, finally relinquishing this territory only after a Yemeni military offensive in the summer of 2012.<sup>25</sup>

In 2015, after Iran-backed Houthi rebels overthrew Yemen's government, AQAP further intensified its domestic activities, seizing the city of al-Mukalla and expanding its control of rural areas

in southern Yemen. AQAP withdrew from al-Mukalla and other parts of the South in the spring of 2016, reportedly after the U.S.-backed Saudi–United Arab Emirates coalition had cut deals with AQAP, paying it to leave certain territory and even integrating some of AQAP's fighters into its own forces that were targeting the Houthis.<sup>26</sup>

More substantive progress has been achieved in the targeting of AQAP's leadership. In 2013, Said al-Shehri, a top AQAP operative, was killed in a drone strike, and in June 2015, the group's leader at the time, Nasir al-Wuhayshi, was killed in another drone strike. Perhaps most significantly, Ibrahim al-Asiri, AQAP's most notorious bomb maker, was killed in a U.S. strike in 2017. The number of U.S. air and drone strikes targeting AQAP terrorists peaked at 131 in 2017 before declining steadily to 41 in 2018 and four in 2020. The Biden Administration continued to deescalate the U.S. counterterrorism campaign against AQAP, launching just two air or drone strikes in 2021<sup>27</sup> and two more in January and February 2023.<sup>28</sup>

In 2018, United Nations experts estimated that AQAP commanded between 6,000 and 7,000 fighters.<sup>29</sup> AQAP has declined since its 2015–2016 peak, losing key leaders to drone strikes and other attacks and suffering manpower losses in factional clashes and defections.<sup>30</sup> In February 2023, the U.N. Analytical Support and Sanctions Monitoring Team reported that AQAP had been reduced to less than 3,000 fighters.<sup>31</sup> Nevertheless, it remains a resilient force that could capitalize on the anarchy of Yemen's multi-sided civil war to seize new territory and plan more attacks on the West.

*Syria.* Al-Qaeda's Syrian affiliate, initially named the al-Nusra Front (ANF), was established as an offshoot of the Islamic State of Iraq (ISI), al-Qaeda's Iraq affiliate, in late 2011 by Abu Muhammad al-Julani, one of ISI leader Abu Bakr al-Baghdadi's lieutenants.<sup>32</sup> By the end of 2016, ANF—now renamed Jabhat Fatah Al Sham (JFS)—“had up to 10,000 fighters” and was “one of the most active rebel groups [fighting the Assad dictatorship] in Syria.”<sup>33</sup> Most ANF cadres are concentrated in rebel strongholds in northwestern Syria, but the group also has small cells operating elsewhere in the country.

ANF had some success in attracting Americans to its cause. An American Muslim recruited by ANF, Moner Mohammad Abusalha, conducted a suicide truck bombing in northern Syria on May 25, 2014,

in the first reported suicide attack by an American in that country.<sup>34</sup> At least five men have been arrested inside the U.S. for providing material assistance to ANF, including Abdirahman Sheik Mohamud, a naturalized U.S. citizen who was arrested in April 2015 after returning from training in Syria and was planning to launch a terrorist attack on U.S. soldiers based in Texas.<sup>35</sup>

In recent years, the al-Qaeda network in Syria has undergone several name changes, allying itself with various Islamist rebel groups. This has made it more difficult to assess the degree of direct threat that it poses outside of Syria.

In a May 2015 interview, al-Julani stated that al-Nusra's intentions were purely local and that, "so as not to muddy the current war" in Syria, ANF was not planning to target the West.<sup>36</sup> In July 2016, al-Nusra rebranded itself as Jabhat Fatah Al Sham (JFS), and al-Julani stated that it would have "no affiliation to any external entity," a move that some experts regarded as a break from al-Qaeda and others regarded as designed to obscure its ties to al-Qaeda and reduce U.S. military pressure on the group.<sup>37</sup>

In January 2017, ANF merged with other Islamist extremist movements to create a new anti-Assad coalition: Hayat Tahrir al-Sham (HTS, Organization for the Liberation of the Levant). In March 2017, it was estimated that HTS had 12,000 to 14,000 fighters.<sup>38</sup> HTS suffered many casualties as Syria's Assad regime, backed by Iran and Russia, tightened the noose around its strongholds in northwest Syria. According to the U.S. Department of State's 2021 *Country Reports on Terrorism*, "[s]ince 2017, ANF has continued to operate through HTS in pursuit of its objectives." The report further estimates that ANF's strength has fallen to "between 5,000 to 10,000 fighters."<sup>39</sup>

Further complicating matters surrounding al-Qaeda's presence, another group in Syria that is connected to al-Qaeda, Hurras al-Din (Guardians of the Religion), was formed in March 2018.<sup>40</sup> Among its ranks were those who defected from HTS, and its suspected emir is an Ayman al-Zawahiri acolyte.<sup>41</sup> Hurras al-Din leaders have criticized HTS for its close ties to Turkey and were among the rival Islamist extremists arrested by HTS in January and February 2022 in Idlib province, the last remaining stronghold of armed resistance in northwest Syria.<sup>42</sup>

HTS is more pragmatic than its ultra-extremist parent organization and has cooperated with

moderate Syrian rebel groups against both the Assad regime and ISIS. However, Abu Muhammad al-Julani's leadership and tactical approach to the conflict, as well as the clear divisions within the Syrian jihad, have led to rebukes from Ayman al-Zawahiri and those who are loyal to him.<sup>43</sup> Zawahiri has stressed the need for unity while condemning the jihadist movement in Syria and its emphasis on holding territory in northwest Syria at the expense of intensifying the struggle against Assad.<sup>44</sup>

One entity that posed a more immediate threat to the West was the Khorasan group, which was thought to comprise dozens of veterans of al-Qaeda's operations in Afghanistan and Pakistan.<sup>45</sup> Al-Zawahiri had dispatched this cadre of operatives to Syria, where they were embedded with ANF and—despite al-Julani's statement that ANF was not targeting the West—charged with organizing terrorist attacks against Western targets. A series of U.S. air strikes in 2014 and 2015 degraded Khorasan's capacity to organize terrorist attacks, and the group's prominence faded after U.S. air strikes killed two of its top leaders in 2016.<sup>46</sup>

Al-Qaeda's presence and activities in Syria, as well as the intent of those who once were aligned with it, remain opaque. Even if offshoots of al-Qaeda are not currently emphasizing their hostility to the U.S., however, that would probably change if they were to succeed in further consolidating power in Syria.

*The Sahel.* Al-Qaeda in the Islamic Maghreb (AQIM) "has an estimated 1,000 fighters operating in the Sahel, including Algeria, northern Mali, southwest Libya, and Niger."<sup>47</sup> AQIM's roots lie in the Algerian civil war of the 1990s after the Algerian government cancelled the second round of elections in 1992 following the victory of the Islamic Salvation Front (FIS) in the first round. The FIS's armed wing, the Armed Islamic Group (GIA), responded by launching a series of attacks and executing those who were even suspected of working with the state. The group also attempted to implement sharia law in Algeria.

The GIA rapidly alienated Algerian civilians, and by the late 1990s, an offshoot, the Salafist Group for Preaching and Combat (GSPC), emerged. Its violence, somewhat less indiscriminate than the GIA's, was focused on security and military targets. Having failed to overthrow the Algerian state, the GSPC began to align itself with al-Qaeda, and

Ayman al-Zawahiri announced its integration into the al-Qaeda network in a September 2006 video. The GSPC subsequently took the AQIM name.

AQIM has carried out a series of regional attacks and has focused on kidnapping Westerners. It has killed some hostages but has used more to extort ransoms from Western governments.<sup>48</sup> Like other al-Qaeda affiliates, AQIM also took advantage of the power vacuums that emerged from the Arab Spring, particularly in Libya where Islamist militias flourished. The weak central government was unable to tame fractious militias, curb tribal and political clashes, or dampen rising tensions between Arabs and Berbers in the West and Arabs and the Toubou tribe in the South.

The September 11, 2012, attack on the U.S. diplomatic mission in Benghazi underscored the extent to which Islamist extremism had flourished in the region. The radical Islamist group that launched the attack, Ansar al-Sharia, had links to AQIM and shared its violent ideology. AQIM and like-minded Islamist allies also grabbed significant amounts of territory in northern Mali late in 2012, implementing a brutal version of sharia law, until a French military intervention helped to push them back.

AQIM continues to support and work with various jihadist groups in the region. In March 2017, the Sahara branch of AQIM merged with three other al-Qaeda or al-Qaeda-linked organizations based in the Sahel to form the Group for Support of Islam and Muslims (JNIM), which has pledged allegiance to al-Qaeda emir Ayman al-Zawahiri.<sup>49</sup> AQIM remains an active threat in Algeria, Libya, Mali, Niger, and Tunisia and has expanded its operations in Burkina Faso and Cote D'Ivoire in recent years. Although AQIM is not known to have targeted the U.S. homeland explicitly, it does threaten regional stability and U.S. allies in North Africa and Europe, where it has gained supporters and operates extensive networks for the smuggling of arms, drugs, and people.

**Islamic State of Iraq and Syria and Its Affiliates.** The Islamic State of Iraq and Syria (ISIS) is an al-Qaeda splinter group that has outstripped its parent organization in terms of its immediate threats to U.S. national interests. Some Western policymakers wrongly perceived the Islamic State of Iraq (ISI), the precursor to ISIS and an al-Qaeda offshoot, as having been strategically defeated following the U.S. “surge” of 2006–2007 in Iraq.

However, although decimated by U.S.-led counterterrorism operations, it exploited the more permissive environment after the 2011 U.S. military withdrawal from Iraq as well as the mounting chaos in Syria after Arab Spring protests were brutally suppressed by the Assad regime.

In both Iraq and Syria, ISI had space in which to operate and a large pool of disaffected individuals from which to recruit. In April 2013, ISI emir Abu Bakr al-Baghdadi declared that the al-Nusra Front, the al-Qaeda affiliate operating in Syria, was merely a front for his operation and that a new organization was being formed: the Islamic State of Iraq and al-Sham. ISIS sought to establish an Islamic state governed by its harsh interpretation of sharia law, thereby posing an existential threat to Christians, Shiite Muslims, Yazidis, and other religious minorities as well as to Sunni Muslims that rejected its leadership. Its long-term goals include leading a jihad to drive Western influence out of the Middle East; diminishing and discrediting Shia Islam, which it considers apostasy; and becoming the nucleus of a global Sunni Islamic empire.

With both al-Qaeda leader Ayman al-Zawahiri and ANF emir Abu Mohammed al-Julani unable to rein in al-Baghdadi, ISIS was expelled from the al-Qaeda network in February 2014. Despite this, ISIS swept through parts of northern and western Iraq and in June 2014 declared the return of the caliphate with its capital in the northern Syrian city of Raqqa. It subsequently kidnapped and then murdered Westerners working in Syria, including American citizens.

A U.S.-led international coalition was assembled to chip away at ISIS's control of territory. The Iraqi Army and Iranian-backed militias, supported by U.S. and coalition air strikes and special operations forces, liberated Mosul in July 2017. In Syria, the U.S.-backed Syrian Democratic Forces militia liberated Raqqa in October 2017, and ISIS's last stronghold in the town of Baghouz fell in March 2019.

ISIS fighters have dispersed, have adopted insurgent tactics, and will continue to pose a regional terrorist threat with direct implications for the U.S. In January 2019, for example, four American military and civilian personnel were killed in a suicide bombing at a market in Manbij in northern Syria.<sup>50</sup>

On October 26, 2019, U.S. special operations forces killed ISIS leader al-Baghdadi in a raid in northwestern Syria's Idlib province near the Turkish

border.<sup>51</sup> ISIS soon named a successor, Abu Ibrahim al-Hashimi al-Qurayshi, the nom de guerre of Amir Muhammad Sa'id Abdal-Rahman al-Mawla. Qurayshi was killed in a February 3, 2022, U.S. special operations raid, also staged in Idlib province.<sup>52</sup> On March 10, 2022, in a recorded audio message that was distributed online, ISIS announced that it had a new leader, Abu al-Hassan al-Hashemi al-Quraishi. Iraqi and Western intelligence officials revealed that the new leader's real name was Juma Awad al-Badri and that he was an Iraqi whose brother was the slain former caliph Abu Bakr al-Baghdadi.<sup>53</sup> Quraishi was killed in a Turkish special forces raid in northern Syria on April 29, 2023, and who will replace him is unclear.<sup>54</sup>

The number of ISIS attacks in Iraq and Syria declined from 2019 to 2020 and fell further in 2021, although its attacks increased in Afghanistan and West Africa. "In 2021," according to Israel's Meir Amit Intelligence and Terrorism Information Center, "a total of 8,147 people were killed or wounded in ISIS attacks, compared to 9,068 people in 2020."<sup>55</sup> In 2022, the global toll of dead and wounded from ISIS terrorist attacks continued to shrink to 6,881 people killed and wounded worldwide with the largest number of attacks and casualties inflicted by ISIS groups in Africa.<sup>56</sup>

Nevertheless, ISIS remains a significant regional threat. The U.S. State Department's Bureau of Counterterrorism estimates that ISIS retains 11,000 to 18,000 fighters in Syria and Iraq, where it is rebuilding its strength in remote desert and mountain regions.<sup>57</sup> In January 2022, during an operation designed to free more than 3,500 members of ISIS who were being held at a prison maintained by the Syrian Democratic Forces militia in northeastern Syria, scores if not hundreds of ISIS terrorists escaped during almost two weeks of fighting.<sup>58</sup>

Although ISIS's territorial control has been broken in Iraq and Syria, its presence has spread far beyond that territory. Terrorist groups around the world have pledged allegiance to Abu Bakr al-Baghdadi and his successors. ISIS today "commands a cohesive global network" of approximately 20 branches and networks in the Middle East, Asia, and Africa, according to National Counterterrorism Center Director Christine Abizaid.<sup>59</sup> ISIS is a threat to stability in all of these regions as it seeks to seize territory, overthrow governments, and impose its harsh brand of Islamic law.

Although the regional ISIS groups may not be as great a threat to the U.S. homeland as the original group in Iraq and Syria was, they represent a significant threat to U.S. allies and U.S. forces deployed overseas. An Islamic State in the Greater Sahara ambush in Niger in October 2017, for example, resulted in the death of four U.S. special operations troops.<sup>60</sup> ISIS-Greater Sahara also has staged attacks on French and Malian military forces in Mali. By 2022, ISIS affiliates in Africa had established a tempo of lethal attacks that surpassed that of its parent organization in Iraq and Syria.<sup>61</sup> In addition, ISIS has made threats against embassies, including those of the U.S., in its areas of influence.<sup>62</sup>

ISIS also poses an ongoing threat to life in the West. On May 3, 2015, for example, two American extremists in contact with an ISIS operative in Syria were fatally shot by police before they could commit mass murder in Garland, Texas.<sup>63</sup> An apparent ISIS plot to assassinate former President George W. Bush in Dallas, Texas, that was foiled in early 2022 resulted in the arrest of Shihab Ahmed Shihab, an Iraqi living in the U.S. who was linked to ISIS operatives. Shihab visited Dallas in November 2021 to videotape the approaches to the former President's home and recruited a team that he hoped to smuggle into the country over the Mexican border.<sup>64</sup> As of January 1, 2023, according to the George Washington University Extremism Tracker, "246 individuals [had] been charged in the U.S. on offenses related to the Islamic State (also known as IS, ISIS, and ISIL) since the first arrests in March 2014."<sup>65</sup>

More commonly, however, the ISIS ideology has inspired individuals and small groups to plan attacks in the U.S. that exhibit little or no apparent contact with the terrorist organization. Between 9/11 and January 2023, there were 37 attacks inside the homeland that were inspired by al-Qaeda or ISIS compared to eight that involved a direct connection to those groups.<sup>66</sup> Tashfeen Malik, one of the perpetrators of the December 2, 2015, shootings that killed 14 people in San Bernardino, California, pledged allegiance to al-Baghdadi.<sup>67</sup> ISIS claimed responsibility for the June 12, 2016, shootings that killed 49 people at a nightclub in Orlando, Florida. Omar Mateen, the perpetrator, had pledged allegiance to al-Baghdadi, but there is no evidence that the attacks were directed by ISIS.<sup>68</sup> The group also claimed responsibility for the October 31, 2017, vehicular attack by Sayfullo Saipov in New York that

killed eight.<sup>69</sup> Saipov also had pledged allegiance to ISIS's emir but did not appear to be operationally guided by ISIS.<sup>70</sup> Such terrorist attacks, apparently incited but not directed by ISIS, are likely to continue for the foreseeable future.

Although its appeal appears to have diminished since the fall of its caliphate in Iraq and Syria, ISIS continues to attract support from self-radicalized Americans. For example, in April 2021, two men were arrested for attempting to provide material support to ISIS. One received a 30-year prison term for providing material support to ISIS, and one was sentenced to life in prison for the December 2017 bombing of a New York City subway.<sup>71</sup>

ISIS also has attempted complex attacks on aviation. It claimed responsibility for the October 31, 2015, downing of a Russian passenger jet over Egypt's Sinai Peninsula, which killed 224 people, and also tried to bring down a flight heading from Sydney, Australia, to Abu Dhabi by concealing an explosive device inside a meat grinder.<sup>72</sup>

ISIS had well-publicized success in attracting the support of foreign fighters. Approximately 250 from the U.S. traveled or attempted to travel to Syria to join its ranks.<sup>73</sup> These individuals, who likely have received military training, could well pose an ongoing threat upon their return to the U.S. by helping to plan attacks or to recruit future generations of jihadists.

ISIS had greater success attracting recruits from Europe with approximately 6,000 departing from European countries.<sup>74</sup> The return of foreign fighters to Europe has led to several attacks. Mehdi Nemmouche, a French citizen of Algerian origin who shot and killed four civilians at the Jewish Museum in Brussels, Belgium, in May 2014, for example, was an ISIS-aligned terrorist who had fought in Syria.<sup>75</sup> In August 2015, Ayoub el-Khazzani, a Moroccan, attempted to gun down passengers in a train travelling between Amsterdam and Paris. Passengers, including two members of the U.S. Army, foiled the attack and restrained him.<sup>76</sup>

Similarly, a group of ISIS foreign fighters teamed with local Islamist terrorists in France to launch a series of suicide and gun attacks on a music venue, restaurants, cafes, and a football stadium, killing 130 and injuring 368 people in Paris in November 2015.<sup>77</sup> Recruits from within the same network then killed 32 people and injured around 300 more in shootings and suicide bombings across Brussels in March 2016.<sup>78</sup>

ISIS ideology also has inspired a wave of vehicle and knife attacks in Europe, including one carried out by a Tunisian who used a truck to kill 86 people and injure 434 more at a Bastille Day celebration in Nice, France, in July 2016.<sup>79</sup> In June 2017, in another such attack, three men killed eight people and injured 47 on or near London Bridge in London, England, by running over them or stabbing them.<sup>80</sup> London Bridge also was the site of a November 29, 2019, knife attack by an ISIS supporter who killed two people and wounded three more before being killed by police.<sup>81</sup>

ISIS has demonstrated an interest in carrying out chemical and biological attacks. Sief Allah H., a Tunisian asylum seeker who was in contact with ISIS, and his German wife Yasmin H. were arrested in Cologne in June 2018 after they had produced ricin as part of a suspected attack.<sup>82</sup> This was the first time that ricin had been successfully produced in the West as part of an alleged Islamist terrorist plot. ISIS also developed weapons that were armed with botulinum toxin, mustard gas, and chlorine gas in what U.S. officials described as “a crash effort aimed at building the biggest arsenal of chemical and, potentially, biological weapons ever assembled by a terrorist group.”<sup>83</sup> ISIS planned to use such weapons in attacks on targets in Western Europe, including U.S. military bases, but its plans were disrupted by U.S. air strikes on its weapons laboratories and personnel. Before the fall of its “caliphate,” ISIS became “the first non-state actor to have developed a banned chemical warfare agent and combined it with a projectile delivery system” when it launched attacks with mustard agent and chlorine gas against adversaries in Iraq and Syria.<sup>84</sup>

Overall, as of May 2019, ISIS was known to have had some involvement—ranging from merely inspirational to hands-on and operational—in more than 150 plots and attacks in Europe since January 2014 that had led to 371 deaths and more than 1,700 injuries.<sup>85</sup> This includes the loss of American lives abroad. An American college student was killed in Paris in November 2015, four Americans were killed in the March 2016 Brussels attack, and another three were killed in the July 2016 Nice attack.<sup>86</sup> Moreover, the threat is by no means confined to Europe: Americans were also killed in attacks for which ISIS claimed responsibility in Tajikistan in July 2018 and Sri Lanka in April 2019.

## Terrorist Groups Operating in Afghanistan and Pakistan (Af-Pak)

A wide variety of Islamist fundamentalist and terrorist groups operate in Afghanistan and Pakistan. Al-Qaeda's direct threat to the U.S. homeland has diminished since the 9/11 terrorist attacks, the U.S. invasion of Afghanistan in 2001, and the killing of Osama bin Laden at his Abbottabad, Pakistan, hideout in May 2011 and was further degraded by an intensive drone campaign in Pakistan's tribal areas and operations by Pakistani security forces. Nevertheless, al-Qaeda's residual presence and the emergence of a regional offshoot of the Islamic State remain concerns.

The Taliban's takeover of Afghanistan in August 2021 amid a chaotic U.S. withdrawal from that country has altered the terrorist landscape, providing a more permissive environment to a wide variety of terrorist and extremist groups. Of particular concern is the prominent role that the Haqqani Network has assumed in the new Taliban government.<sup>87</sup> The Haqqani Network, a loyal proxy of Pakistan's Inter-Services Intelligence (ISI) agency, allied itself with the Taliban during the Afghan War and became integrated with its leadership structure under the leadership of Sirajuddin Haqqani. Throughout the course of the war, the Haqqani Network was responsible for many of the deadliest attacks on U.S. and Afghan forces,<sup>88</sup> including an attack on the U.S. embassy in Afghanistan and the single deadliest attack on the CIA in the agency's history. Today, Sirajuddin Haqqani serves as Afghanistan's interior minister, and other members of his network have assumed cabinet positions.

The Haqqanis maintain close links to al-Qaeda. According to the U.N.'s Analytical Support and Sanctions Monitoring Team, "[t]he Haqqani Network remains a hub for outreach and cooperation with regional foreign terrorist groups and is the primary liaison between the Taliban and Al-Qaida."<sup>89</sup>

Reports of an ISIS presence in Afghanistan first began to surface in 2014, and the group slowly gained a small foothold in subsequent years. The lack of publicly available information and the willingness of local fighters in the region to change allegiances with little thought make it next to impossible to know the exact number of Islamic State fighters in Afghanistan at any given time. In September 2019, U.S. officials estimated that there were between 2,000 and 5,000 ISIS fighters in

Afghanistan.<sup>90</sup> In arguably its highest-profile attack, the Islamic State in Afghanistan claimed responsibility for a deadly suicide bombing at the Kabul airport in August 2021 that "killed more than 170 civilians and 13 U.S. soldiers."<sup>91</sup>

Experts believe that there is little coordination between the Islamic State branch operating in Afghanistan and the central command structure located in the Middle East. Instead, the branch draws recruits from disaffected members of the Pakistani Taliban and other radicalized Afghans and has frequently found itself at odds with the Afghan Taliban, with which it competes for resources, territory, and recruits.

While the Islamic State and the Afghan Taliban have engaged in heavy fighting in recent years, the Haqqani Network has maintained links to the Islamic State, which itself may have splintered into different factions. In 2020, the group appointed a former midlevel Haqqani commander as its new leader, and Afghanistan's intelligence agency killed five members of a joint cell of Haqqani Network and Islamic State fighters and arrested eight others.<sup>92</sup> Scholar Theo Farrell contends that "the Haqqanis have the deepest links with [the Islamic State] of any faction within the Taliban."<sup>93</sup>

Ultimately, both the Islamic State in Afghanistan and al-Qaeda continue to pose the greatest threat to the U.S. homeland. In March 2019, General Joseph Votel, then Commander, U.S. Central Command, said that he believed the Islamic State in Afghanistan "does have ideations focused on external operations toward our homeland."<sup>94</sup> In late 2021, a senior Biden Administration official warned that both al-Qaeda and the Islamic State in Afghanistan are intent on conducting terrorist attacks on the United States and that "[w]e could see ISIS-K generate that capability in somewhere between 6 or 12 months."<sup>95</sup> According to the *Global Terrorism Index*, "Following the Taliban's takeover of power after the fall of Kabul in August 2021, ISK emerged as the most active terrorist group in Afghanistan. They were responsible for 115 incidents and 422 deaths in 2022" and "account[ed] for almost 67 per cent of total terrorism-related deaths in the country for the year."<sup>96</sup>

Pakistan remains both a victim of and a key benefactor of regional terrorist groups. Pakistan's ISI maintained links to terrorist groups operating in disputed Kashmir and in Afghanistan for decades,

viewing them as an extension of Pakistani foreign policy. Most of the terrorist groups operating in the country maintain some ties with the Pakistani military–intelligence establishment. Several domestic terrorist groups focus their attacks on non-Muslims and Muslim minorities that are deemed un-Islamic inside Pakistan. A smaller number of terrorist groups like the Pakistani Taliban are hostile to the Pakistani state and have carried out countless attacks on civilian and military targets inside the country.

After a bloody wave of Pakistani Taliban terrorism between 2006 and 2016, a series of military operations in Pakistan’s Federally Administered Tribal Areas and peace deals struck with local militant commanders caused terrorism inside Pakistan to subside in the late 2010s.<sup>97</sup> However, since the takeover of Afghanistan by the Haqqani Network and Afghan Taliban, Pakistan has again witnessed a spike in bombings and terrorist attacks by the Pakistani Taliban. Pakistan has sought to pressure the Afghan Taliban and the Haqqani Network to use their influence to persuade the Pakistani Taliban to end these attacks, but with only mixed success. Despite Pakistan’s willingness to shelter the Afghan Taliban leadership throughout the course of the Afghan War, relations between the Afghan Taliban and the Pakistani government remain difficult.<sup>98</sup>

The *Global Terrorism Index* reports that in 2022, “deaths in Pakistan [rose] significantly to 643, a 120 per cent increase from 292 deaths in 2021.”<sup>99</sup> Afghanistan, by contrast, “recorded a 58 per cent decline in terrorism deaths, from 1,499 to 633.”<sup>100</sup> Partly this is a product of the fact that the Taliban, being in power in Afghanistan, are a state actor, and “their attacks fall outside the scope of the GTI’s definition of terrorism.”<sup>101</sup>

The Pakistani Taliban continues to expand its reach inside Pakistan. In 2023, the terrorist group announced that it was establishing a “shadow province” in the Pakistani province of Baluchistan, where China is involved in several high-profile infrastructure projects and Chinese contractors have been targeted by terrorists.<sup>102</sup> In one particularly deadly attack in January 2023, a Pakistani Taliban suicide bomber attacked a mosque in northwestern Pakistan, killing over 100 and wounding 225.<sup>103</sup>

Nevertheless, Pakistan’s continued support for terrorist groups that have links to others like al-Qaeda, the Afghan Taliban, and the Haqqani

Network undermines U.S. counterterrorism goals in the region and poses an ongoing threat to the U.S. homeland and its interests and partners abroad. Pakistan’s ongoing patronage of terrorist groups operating in Kashmir, like Lashkar e Taiba and Jaish e Mohammed (and their various offspring and splinter groups), has ensured continued volatility in the Kashmir dispute and prevented any breakthrough in India–Pakistan diplomatic relations. Pakistan’s military and intelligence leaders maintain a short-term tactical approach of fighting some terrorist groups that are deemed a threat to the state while supporting others that are aligned with Pakistan’s foreign policy goals.

While hosting Indian Prime Minister Narendra Modi for a state visit in Washington in June 2023, the U.S. government issued a joint statement with India calling on Pakistan “to take immediate action to ensure that no territory under its control is used for launching terrorist attacks” and “reiterated the call for concerted action against all UN-listed terrorist groups including Al-Qa’ida, ISIS/Daesh, Lashkar e-Tayyiba (LeT), Jaish-e-Mohammed (JeM), and Hizb-ul-Mujahideen.”<sup>104</sup>

## Conclusion

ISIS has lost its so-called caliphate, but it remains a highly dangerous adversary that is capable of planning and executing attacks regionally and—at the very least—inspiring them in the West. It has transitioned from a quasi-state to an insurgency, relying on its affiliates to project strength far beyond its former Syrian and Iraqi strongholds.

Meanwhile, despite sustained losses in leadership, al-Qaeda remains resilient. It has curried favor with other Sunnis in areas of strategic importance to it, has focused its resources on local conflicts, has occasionally controlled territory, and has deemphasized (but not eschewed) focus on the global jihad. This approach has been particularly noticeable since the Arab Spring.

Regardless of any short-term tactical considerations, both groups ultimately aspire to attack the U.S. homeland and U.S. interests abroad. While the U.S. has hardened its domestic defenses, both ISIS and al-Qaeda can rely on radicalized individuals living within the U.S. to answer their call for jihadist terrorism. Furthermore, it has been demonstrated repeatedly that there are ample opportunities to target Americans overseas in countries that are

more vulnerable to terrorist attack. If it wishes to contain and ultimately end Islamist violence, the U.S. must continue to bring effective pressure to bear on these groups and those that support them.

The terrorist threat to the U.S. homeland from Afghanistan and Pakistan remains real and uncertain in a rapidly shifting landscape that is home to a wide variety of extremist and terrorist groups. On one hand, the capabilities of al-Qaeda, the terrorist group that is most directly focused on attacking the U.S. homeland, have been degraded in South Asia. On the other hand, the U.S. withdrawal from Afghanistan and the Taliban/Haqqani Network takeover of the country have generated significant uncertainty about Afghanistan’s future and the

panoply of terrorist and extremist groups operating in that space, including the local branch of the Islamic State.

In its interim peace agreement with the U.S., the Taliban ostensibly committed to preventing Afghan soil from being used to launch attacks against the U.S. homeland, but experts remain skeptical of these commitments. For its part, Pakistan continues to harbor and support a vibrant ecosystem of terrorist groups within its borders.

This *Index* assesses the threat from ISIS, al-Qaeda, and their affiliated organizations as “aggressive” for level of provocative behavior and “capable” for level of capability.

## Threats: Non-State Actors

|            | HOSTILE    | AGGRESSIVE | TESTING | ASSERTIVE    | BENIGN   |
|------------|------------|------------|---------|--------------|----------|
| Behavior   |            | ✓          |         |              |          |
|            | FORMIDABLE | GATHERING  | CAPABLE | ASPIRATIONAL | MARGINAL |
| Capability |            |            | ✓       |              |          |



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## Conclusion: Global Threat Level

America faces challenges to its security at home and interests abroad from countries and organizations that have:

- Interests that conflict with those of the United States;
- Sometimes hostile intentions toward the U.S.; and
- In some cases, growing military capabilities that are leveraged to impose an adversary's will by coercing or intimidating neighboring countries, thereby creating regional instabilities.

The government of the United States constantly faces the challenge of employing—sometimes alone but more often in concert with allies—the right mix of diplomatic, economic, public information, intelligence, and military capabilities to protect and advance U.S. interests. Because this *Index* focuses on the military component of national power, its assessment of threats is correspondingly an assessment of the military or physical threat posed by each entity addressed in this section.

**China**, the most comprehensive threat the U.S. faces, remained “aggressive” in the scope of its provocative behavior and earns the score of “formidable” for its capability because of its continued investment in the modernization and expansion of its military and the particular attention it has paid to its space, cyber, and artificial intelligence capabilities. The People’s Liberation Army continues to extend its reach and military activity beyond its immediate region and engages in larger and more comprehensive exercises, including live-fire exercises in the East China Sea near Taiwan and aggressive naval and air patrols in the South China Sea.

China is rapidly closing the capability gap between its forces and those of the United States and is no longer a distant competitor. It has continued to conduct probes of the South Korean and Japanese air defense identification zones, drawing rebukes from both Seoul and Tokyo, and its statements about Taiwan and exercise of military capabilities in the air and sea around the island have become increasingly belligerent. China is taking note of the war in Ukraine and U.S. military developments and has been adjusting its own posture, training, and investments accordingly.

**Russia** remains the primary threat to American interests in Europe as well as the most pressing threat to the United States. While it may not threaten U.S. global interests the way the Soviet Union once did, it threatens a number of key U.S. allies and interests in Europe and the Middle East. Russia’s invasion of Ukraine reintroduced conventional war to Europe—the largest conflict on that continent since the end of World War II and one with economic and security repercussions that are felt across the globe. Moscow also remains committed to massive pro-Russia propaganda campaigns in other Eastern European countries, as well as disruptive activities around its periphery and across the Middle East. It maintains the world’s largest nuclear arsenal, which poses an existential threat-in-being to the U.S. homeland, although a strike is highly unlikely at present.

The *2024 Index* assesses the threat emanating from Russia as “hostile” and “formidable” (the highest categories on the scale) for level of provocative behavior and for level of capability, respectively. Though Russia is consuming its inventory of munitions, supplies, equipment, and even military personnel in its war against Ukraine, it is also replacing those items and people. Russia’s industrial capacity, unlike Ukraine’s, remains untouched by the war,

## Behavior of Threats

|                  | HOSTILE | AGGRESSIVE | TESTING | ASSERTIVE | BENIGN |
|------------------|---------|------------|---------|-----------|--------|
| China            |         | ✓          |         |           |        |
| Russia           | ✓       |            |         |           |        |
| Iran             |         | ✓          |         |           |        |
| North Korea      |         |            | ✓       |           |        |
| Non-State Actors |         | ✓          |         |           |        |
| <b>OVERALL</b>   |         | ✓          |         |           |        |

## Capability of Threats

|                  | FORMIDABLE | GATHERING | CAPABLE | ASPIRATIONAL | MARGINAL |
|------------------|------------|-----------|---------|--------------|----------|
| China            | ✓          |           |         |              |          |
| Russia           | ✓          |           |         |              |          |
| Iran             |            | ✓         |         |              |          |
| North Korea      |            | ✓         |         |              |          |
| Non-State Actors |            |           | ✓       |              |          |
| <b>OVERALL</b>   | ✓          |           |         |              |          |

## Threats to U.S. Vital Interests

|                  | SEVERE | HIGH | ELEVATED | GUARDED | LOW |
|------------------|--------|------|----------|---------|-----|
| China            |        | ✓    |          |         |     |
| Russia           |        | ✓    |          |         |     |
| Iran             |        | ✓    |          |         |     |
| North Korea      |        | ✓    |          |         |     |
| Non-State Actors |        | ✓    |          |         |     |
| <b>OVERALL</b>   |        | ✓    |          |         |     |

and Russia's military is gaining combat experience. Russia has shifted to a wartime economy. Consequently, the war may actually serve to increase the challenge that Russia presents to U.S. interests on the continent.

**Iran** represents by far the most significant security challenge to the United States, its allies, and its interests in the greater Middle East. Its open hostility to the United States and Israel, sponsorship of terrorist groups like Hezbollah, and history of threatening the commons underscore the problem

it could pose. Today, Iran's provocations are of primary concern to the region and America's allies, friends, and assets there.

Iran relies heavily on irregular (to include political) warfare against others in the region and fields far more ballistic missiles than are fielded by any of its neighbors. Its development of ballistic missiles and its potential nuclear capability also make it a long-term threat to the security of the U.S. homeland. In addition, Iran has continued its aggressive efforts to shape the domestic political landscape in



Iraq, adding to the region’s general instability. The *2024 Index* extends the *2023 Index*’s assessment of Iran’s behavior as “aggressive” and its capability as “gathering.”

**North Korea**’s military poses a security challenge for American allies South Korea and Japan, as well as for U.S. bases in those countries and on the island territory of Guam. North Korean officials are belligerent toward the United States, often issuing military and diplomatic threats. Pyongyang also has engaged in a range of provocative behavior that includes nuclear and missile tests and tactical-level attacks on South Korea.

North Korea has used its missile and nuclear tests to enhance its prestige and importance domestically, regionally, and globally and to extract concessions from the United States in negotiations on its nuclear program and various aid packages. Such developments also improve North Korea’s military posture. U.S. and allied intelligence agencies assess that Pyongyang has already achieved nuclear warhead miniaturization, the ability to place nuclear weapons on its medium-range missiles, and the ability to reach the continental United States with an intercontinental ballistic missile. North Korea also uses cyber warfare as a means of guerilla warfare against its adversaries and international financial institutions. The *2024 Index* therefore assesses the overall threat from North Korea, considering the range of contingencies, as “testing” for level of provocative behavior and “gathering” for level of capability.

**A broad array of terrorist groups** remain the most hostile of any of the threats to America examined in the *Index*. The primary terrorist groups of concern to the U.S. homeland and to Americans abroad are the Islamic State of Iraq and al-Sham

(ISIS) and al-Qaeda. Al-Qaeda and its branches remain active and effective in Syria, Yemen, Iraq, and the Sahel of Northern Africa.

Though no longer a territory-holding entity, ISIS remains a serious presence in the Middle East, in South and Southeast Asia, and throughout Africa, threatening stability as it seeks to overthrow governments and impose an extreme form of Islamic law. Its ideology continues to inspire attacks against Americans and U.S. interests. Fortunately, Middle East terrorist groups remain the least capable threats facing the U.S., but they cannot be dismissed. This prompts a score of “aggressive” for their collective, overarching behavior but only “capable” for their ability to harm the most important U.S. security interests, combining to an overall score of “high.”

Just as there are American interests that are not covered by this *Index*, there may be additional threats to American interests that are not identified here. This *Index* focuses on the more apparent sources of risk and those that appear to pose the greatest threat.

Compiling the assessments of these threat sources, the *2024 Index* rates the overall global threat environment as “aggressive” and “formidable” (up from the *2023 Index*’s “gathering”) in the areas of threat actor behavior and material ability to harm U.S. security interests. Taking into account concern over China’s dramatic expansion of its power projection abilities (especially its investment in nuclear weapons), as well as Russia’s potentially desperate desire for victory in its war against Ukraine, which could lead it to be more aggressive in other areas of military competition with the U.S. and Western allies, and Iran’s unabated investments in its nuclear and ballistic missile programs, this leads to an aggregated score of “high.”

## Threats to U.S. Vital Interests: Summary





# U.S. Military Power



# An Assessment of U.S. Military Power

America is a global power with global interests, and its military is tasked with defending the country from attack and protecting its national interests on a correspondingly global scale. The United States therefore does not have the luxury of focusing only on one geographic area or narrow challenge to its interests. Its economy depends on global trade; it has obligations with many allies; and it must account for several major competitors that routinely, consistently, and aggressively challenge its interests and seek to displace its influence in key regions. It follows that its military should be commensurately sized for the task and possess the necessary tools, skills, and readiness for action. Beyond that, the U.S. military must be capable of protecting the freedom to use the global commons—the sea, air, space, and cyberspace domains on which American prosperity and political influence depend.

As noted in all preceding editions of the *Index of U.S. Military Strength*, however, the U.S. does not have the necessary force to address more than one major regional contingency (MRC) and is not ready to carry out its duties effectively. In fact, its condition has worsened over the past two to three years.

- The U.S. finds itself increasingly challenged both by major competitors such as China and Russia and by the destabilizing effects of terrorist and insurgent elements operating in regions that are of substantial interest to the U.S.
- Russia's large-scale, conventional invasion of Ukraine in February 2022 and the war that has ravaged Ukraine since then are proof that war in regions of interest to the U.S. remains a feature of modern times—something that is not lost on China as it expands its military power and threatens Japan and other U.S. allies and partners in the Indo-Pacific region more aggressively.

- Poland, Germany, Lithuania, Japan, and several other countries have taken note of this and are committed to substantially improving the capacity, capability, and readiness of their military forces, although progress has been spotty. The United States, however, has not made a similar commitment and has seen further decline as inflation has eroded the funding that is provided to the military.

## How to Think About Sizing Military Power

Military power consists of many things and is the result of how all of its constituent pieces are brought together to create an effective warfighting force, but it begins with the people and equipment used to conduct war: the weapons, tanks, ships, airplanes, and supporting tools that make it possible for a force to impose its will on another or to prevent such an outcome from happening, which is the point of deterrence.

However, simply counting the number of people, tanks, or combat aircraft that the U.S. possesses would be insufficient because it would lack context. For example, the U.S. Army might have 100 tanks, but to accomplish a specific military task, 1,000 or more might be needed or none at all. It might be that relevant terrain is especially ill-suited to tanks or that the tanks one has are inferior to the enemy's. The enemy could be quite adept at using tanks, or his tank operations might be integrated into a larger employment concept that leverages the supporting fires of infantry and airpower, whereas one's own tanks are poorly maintained, the crews are not well prepared, or one's doctrine is irrelevant.

Success in war is partly a function of matching the tools of warfare to a specific task and employing those tools effectively in battle. Get these wrong—tools, objective, competence, or context—and you lose.

Another key element is the military's capacity to conduct operations: how many of the right tools—people, tanks, planes, or ships—it has. One might have the right tools and know how to use them effectively but not have enough to win. Because one cannot know with certainty beforehand just when, where, against whom, and for what reason a battle might be fought, determining how much capability is needed is an exercise that requires informed but not certain judgment.

The war in Ukraine is a powerful illustration of this. By the numbers, Russia should have achieved a quick victory over the smaller, less modern Ukrainian military. For various reasons that include leadership, tactics, training, and resupply, the Ukrainians have performed much better than the Russians, who have performed poorly overall. And yet, in spite of its demonstrated incompetence, Russia's much larger military has been able to sustain operations through its willingness to commit its vast reserves of munitions, equipment, and people to battle. Tactical and operational brilliance has its place, but so does sheer mass.

Further, two different combatants can use the same set of tools in radically different ways to quite different effects. The concept of employment matters. Concepts are developed to account for numbers, capabilities, material readiness, and all sorts of other factors that enable or constrain one's actions, such as whether one fights alone or alongside allies, on familiar or strange terrain, or with a large, well-equipped force or a small, poorly equipped force. A thinking adversary will analyze his opponent for weaknesses or patterns of behavior and seek to develop techniques, approaches, and tools that exploit such shortfalls or predictable patterns—the asymmetries of war. One need not try to match an enemy tank for tank: In many cases, not trying is more effective.

This appears to be what China is doing. Having analyzed U.S. forces, the performance characteristics of U.S. platforms and weapons, and the geography and basing options affecting U.S. defense posture in the Indo-Pacific, China has invested heavily in shore-based long-range missiles, an extensive fleet of ships optimized for the local maritime environment, and a deepening inventory of guided munitions. China does not need a force that mirrors that of the U.S.: It is building a force that leverages the asymmetries between China's situation and that of the United States.

All of these factors and a multitude of others affect the outcome of any military contest. Military planners attempt to account for them when devising requirements, developing training and exercise plans, formulating war plans, and advising the President in his role as Commander in Chief of U.S. military forces.

Measuring hard combat power in terms of its capability, capacity, and readiness to defend U.S. vital interests is difficult, especially in such a limited space as this *Index*, but not impossible. However difficult the task, the Secretary of Defense and the military services have to make such decisions every year when the annual defense budget request is submitted to Congress.

The adequacy of hard power is affected most directly by the resources the nation is willing to apply. Although that decision is informed to a significant degree by an appreciation of threats to U.S. interests and the ability of a given defense portfolio to protect U.S. interests against such threats, it is not informed solely by such considerations; hence the importance of clarity and honesty in determining exactly what is needed in terms of hard power and the status of such power from year to year.

Administrations take various approaches in determining the type and amount of military power needed and, by extension, the amount of money and other resources that will be necessary to support that power. After defining the national interests to be protected, the Department of Defense (DOD) can use worst-case scenarios to determine the maximum challenges the U.S. military might have to overcome. Another way is to redefine what constitutes a threat. By taking a different view of whether major actors pose a meaningful threat and of the extent to which friends and allies have the ability to assist the U.S. in meeting security objectives, one can arrive at very different conclusions about the necessary level of military strength.

For example, one Administration might view China as a rising belligerent power bent on dominating the Asia-Pacific region. Another Administration might view China as an inherently peaceful rising economic power and the expansion of its military capabilities as naturally commensurate with its strengthening status. There can be dramatically different perspectives with respect to how China might use its military power and what would constitute an effective U.S. response, and the difference

between these perspectives can dramatically affect how one thinks about U.S. defense requirements. So, too, can policymakers amplify or downplay risk to justify defense budget decisions.

There also can be strongly differing views on requirements for operational capacity.

- Does the country need enough for two major combat operations (MCOs) at roughly the same time or just enough for a single major operation and some number of lesser cases?
- To what extent should “presence” tasks—the use of forces for routine engagement with partner countries or simply to be on hand in a region for crisis response—be in addition to or a subset of a military force that is sized to handle big wars?
- How much value should be assigned to advanced technologies as they are incorporated into the force, especially if they have not been proven in combat settings?
- What is the likelihood of conventional war, and (if one thinks it is minimal) what level of risk is one willing to accept that sufficient warning will allow for rearming?

### Where to Start

There are two major references that one can use to help sort through the variables and arrive at a starting point for assessing the adequacy of today’s military posture: government studies and historical experience. The government occasionally conducts formal reviews that are meant to inform decisions on capabilities and capacities across the Joint Force relative to the threat environment (current and projected) and evolutions in operating conditions, the advancement of technologies, and aspects of U.S. interests that may call for one type of military response over another.

The 1993 Bottom-Up Review (BUR) conducted by then-Secretary of Defense Les Aspin is one example that is frequently cited by analysts. Secretary Aspin recognized that “the dramatic changes that [had] occurred in the world as a result of the end of the Cold War and the dissolution of the Soviet Union” had “fundamentally altered America’s security needs” and were driving an imperative “to

reassess all of our defense concepts, plans, and programs from the ground up.”<sup>1</sup>

The BUR formally established the requirement that U.S. forces should be able “to achieve decisive victory in two nearly simultaneous major regional conflicts and to conduct combat operations characterized by rapid response and a high probability of success, while minimizing the risk of significant American casualties.”<sup>2</sup> Thus was formalized the two-MRC standard.

Since that study, the government has undertaken others as Administrations, national conditions, and world events have changed the context of national security. Quadrennial Defense Reviews (QDRs) were conducted in 1997, 2010, and 2014 and were accompanied by independent National Defense Panel (NDP) reports that reviewed and commented on them. Both sets of documents purported to serve as key assessments, but analysts came to minimize their value, regarding them as justifications for executive branch policy preferences (the QDR reports) or overly broad generalized commentaries (the NDP reports) that lack substantive discussion about threats to U.S. interests, a credible strategy for dealing with them, and the actual ability of the U.S. military to meet national security requirements.

The QDR was replaced by the National Defense Strategy (NDS), released in 2018,<sup>3</sup> and the independent perspectives of the formal DOD review by the National Defense Strategy Commission, which released its view of the NDS in November 2018.<sup>4</sup> Departing from their predecessors, neither document proposed specific force structures or end strength goals for the services, but both were very clear in arguing that America’s military should be able to address more than one major security challenge at a time. The commission’s report even criticized the NDS for not making a stronger case for a larger military that would be capable of meeting the challenges posed by four named competitors—China, Russia, Iran, and North Korea—while also possessing the capacity to address lesser, though still important, military tasks that included presence, crisis response, and assistance missions.

The Biden Administration released a National Defense Strategy in 2022<sup>5</sup> (replacing the Trump Administration’s 2018 NDS) in conjunction with its overarching National Security Strategy (NSS).<sup>6</sup> The 2022 NDS echoes the general goal for the U.S. military to “deter and prevent adversaries from

directly threatening the United States and our allies, inhibiting access to the global commons, or dominating key regions,”<sup>7</sup> all of which are themes that have remained remarkably consistent from one Administration to the next for several decades. Taken at face value and considering the challenges posed simultaneously by a multitude of competitors in several regions, the Biden NSS and NDS imply that the military should have the capability and capacity to meet this objective, but they are less explicit than predecessor documents.

The current NSS and NDS prioritize the threat posed by China but, while naming other threats that include Russia, Iran, North Korea, and violent extremist organizations, purport to deal with them by improved forward posture of U.S. forces, improving national resilience to attack, and bettering the ability of the U.S. to collaborate with regional allies. Whether one agrees with the efficacy of this approach or not, there is consistency even in the current leading documents in acknowledging that the U.S. must contend with numerous threats to its interests in many different regions.<sup>8</sup>

### **Correlation of Forces as a Factor in Force Sizing**

During the Cold War, the U.S. used the Soviet threat as its primary reference in determining its hard-power needs. At that time, the correlation of forces—a comparison of one force against another to determine strengths and weaknesses—was highly symmetrical. U.S. planners compared tanks, aircraft, and ships against their direct counterparts in the opposing force. These comparative assessments drove the sizing, characteristics, and capabilities of fleets, armies, and air forces.

The evolution of guided, precision munitions and the rapid technological advancements in surveillance and targeting systems since the late 1980s have made comparing combat power more difficult. What was largely a platform-versus-platform model has shifted to a munitions-versus-target model. Evidence of this has been seen on recent battlefields in Nagorno-Karabakh and Ukraine.

The proliferation of precise weaponry means increasingly that each round, bomb, rocket, missile, and even (in some instances) individual bullet can hit its intended target, thus decreasing the number of munitions needed to prosecute an operation. It also means that an operating environment’s

lethality increases significantly for the people and platforms involved. We have reached the point at which, instead of focusing primarily on how many ships or airplanes the enemy can bring to bear against one’s own force, one must consider how many “smart munitions” the enemy has when thinking about how many platforms and people are needed to win a combat engagement.<sup>9</sup> The increasing presence of unmanned systems that can deliver precision-guided munitions against targets adds complexity and danger to the modern battlefield. There is also the higher cost of fielding precision weapons rather than less expensive but also less accurate conventional (unguided) munitions.

In one sense, increased precision and the technological advances now being incorporated into U.S. weapons, platforms, and operating concepts make it possible to do far more than ever before with fewer assets.

- Signature reduction (stealth) makes it harder for the enemy to find and target platforms, and the increased precision of weapons makes it possible for fewer platforms, when carrying such weapons, to hit many more targets.
- The U.S. military’s ability to harness computers, modern telecommunications, space-based platforms—such as for surveillance, communications, and positioning-navigation-timing (PNT) support from GPS satellites—and networked operations potentially means that in certain situations, smaller forces can have far greater effect in battle than was possible at any other time in history (although these same advances also enable enemy forces).
- Some military functions—such as seizing, holding, and occupying territory—may require a certain number of soldiers no matter how state-of-the-art their equipment may be. For example, the number of infantry squads needed to secure an urban area where line of sight is constrained and precision weapons have limited utility is the same as the number needed in World War II. Again, current operations in Ukraine are illustrative as Russian forces have found that seizing, occupying, and holding ground is a manpower-intensive effort.



Regardless of the improved capability of smaller forces, there is a downside to fewer numbers. With smaller forces, each element of the force represents a greater percentage of its combat power. Each casualty or equipment loss therefore takes a larger toll on the ability of the force to sustain high-tempo, high-intensity combat operations over time, especially if the force is dispersed across a wide theater or multiple theaters of operation.

As advanced technology has become more affordable, it has become more accessible for nearly any actor, whether state or non-state.<sup>10</sup> Consequently, it may well be that the outcomes of future wars will depend far more on the skill of the forces and their capacity to sustain operations over time than they will on some great disparity in technology. If so, readiness and capacity will become more important than absolute advances in capability.

All of this illustrates both the need to exercise judgment in assessing the adequacy of America's military power and the difficulties involved in exercising that judgment. Yet without such an assessment, all that remains are the defense strategy reviews, which are subject to filtering and manipulation to suit policy interests; annual budget submissions, which typically favor desired military programs at presumed levels of affordability and are therefore necessarily budget-constrained; and leadership posture statements, which often simply align with executive branch policy priorities.

### The U.S. Joint Force and the Art of War

This section of the *Index* assesses the adequacy of America's defense posture as it pertains to a conventional understanding of hard power, defined as the ability of U.S. military forces to engage and defeat an enemy's forces in battle at a scale commensurate with America's vital national interests. While some hard truths in military affairs are appropriately addressed by mathematics and science, others are not. Speed, range, probability of detection, and radar cross-section are examples of quantifiable characteristics that can be measured. Specific future instances in which U.S. military power will be needed, the competence of the enemy, the political will to sustain operations in the face of mounting deaths and destruction, and the absolute amount of strength needed to win are matters of judgment and experience, but they nevertheless affect how large and capable a force one might need.

In conducting our assessment, we accounted for both quantitative and qualitative aspects of military forces, informed by an experience-based understanding of military operations and the expertise of external reviewers. The authors of these military sections bring a combined total of more than a hundred years of uniformed military experience to their analysis.

Military effectiveness is as much an art as it is a science. Specific military capabilities represented in weapons, platforms, and military units can be used individually to some effect, but practitioners of war have learned that combining the tools of war in various ways and orchestrating their tactical employment in series or simultaneously can dramatically amplify the effectiveness of the force that is committed to battle.

Employment concepts are exceedingly hard to measure in any quantitative way, but their value as critical contributors in the conduct of war is undeniable. How they are used is very much an art-of-war matter that is learned through experience over time.

### What Is Not Being Assessed

In assessing the current status of America's military forces, this *Index* uses the primary measures used by the military services themselves when they discuss their ability to employ hard combat power.

- The Army's unit of measure is the brigade combat team (BCT).
- The Marine Corps structures itself by battalions.
- For the Navy, it is the number of ships in its combat fleet.
- The most consistent measure for the Air Force is the total number of aircraft, sometimes broken down into the two primary subtypes of fighters and bombers.

Obviously, this is not the totality of service capabilities, and it certainly is not everything needed for war. Even the services would argue that "what they bring to the fight" is more than these simple metrics. But discussions about the complexity, nuance, and permutations of military power that

take place among career professionals are endless and can be incomprehensible to most people who have not spent years closely studying such issues. Nevertheless, measures must be found by which to discuss military power in common terms, and these measures can be viewed as surrogates that subsume or represent the vast number of other things that make these units of measure possible and effective in battle. For example:

- Combat forces depend on a vast logistics system that supplies everything from food and water to fuel, ammunition, and repair parts.
- Military operations require engineer support, and the force needs medical, dental, and administrative capabilities.
- The military also fields units that transport combat power and its sustainment to wherever they may be needed around the world.

The point is that the military spear has a great deal of shaft that makes it possible for the tip to locate, close with, and destroy its target, and there is a rough proportionality between shaft and tip. Thus, in assessing the basic units of measure for combat power, one can get a sense of what is probably needed in the combat support, combat service support, and supporting establishment echelons.

The scope of this *Index* does not extend to analysis of everything that makes hard power possible; it focuses on the status of the hard power itself. It also does not assess the services' Reserve and National Guard components, although they account for roughly one-third of the U.S. military force and have been essential to the conduct of operations since September 2001.<sup>11</sup> Consistent assessment of their capability, readiness, and operational role is challenging because each service determines the balance among its Active, Reserve, and National Guard elements differently: Only the Army and Air Force have Guard elements; the Navy and Marine Corps do not. This balance can change from year to year and is based on factors that include the respective elements' costs, availability for operational employment, and time needed to respond to an emergent crisis as well as the allocation of roles among the elements and political considerations.<sup>12</sup>

As with other elements that are essential to the effective employment of combat power—logistics, medical support, strategic lift, training, etc.—the U.S. military could not handle a major conflict without the Reserve and Guard forces. Nevertheless, to make the challenge of annually assessing the status of U.S. military strength using consistent metrics over time more manageable, this *Index* looks at something that is usually associated with the Active component of each service: the baseline requirement for a given amount of combat power that is readily available for use in a major combat operation. There are exceptions, however. For example, in the *2020 Index*, four Army National Guard BCTs were counted as “available” for use because of the significant amounts of additional resources that had been dedicated specifically to these formations to raise their readiness levels.<sup>13</sup>

### The Defense Budget and Strategic Guidance

How much we spend on defense does not automatically determine the U.S. military's posture or capacity. As a matter of fact, simply looking at how much is allocated to defense does not tell us much about the capacity, modernity, or readiness of the forces. Proper funding is a necessary condition for a capable, modern, and ready force, but it is not sufficient by itself. A larger defense budget, for example, can be associated with less military capability if the money is allocated inappropriately or spent wastefully. Nevertheless, the budget does reflect the importance assigned to defending the nation and its interests in prioritizing federal spending, and there is a rough correlation between the percentage of the federal budget or national gross domestic product that is spent on defense and the military's status because costs for equipment, personnel, and readiness tend to reflect general costs across the economy and the evolution of new technologies and materials that are harnessed for military affairs.

Absent a significant threat to the country's survival, the U.S. government will always balance spending on defense against spending in all of the other areas of government activity that are deemed necessary or desirable. Ideally, defense requirements are determined by identifying national interests that might need to be protected with military power; assessing the nature of threats to those interests, what would be needed to defeat those

threats, and the costs associated with that capability; and then determining what the country can afford or is willing to spend. *Any difference between assessed requirements and the amount of money actually spent on defense would constitute a risk to U.S. security interests.*

This *Index* enthusiastically adopts this approach: interests, threats, requirements, resulting force, and associated budget. Spending less than the amount needed to maintain a two-MRC force results in policy debates about where to accept risk: force modernization, the capacity to conduct large-scale or multiple simultaneous operations, or force readiness. The composition of the force and the understanding of military risk have become more salient issues with the shift toward competition with China and Russia. Certainly, Russia's war against Ukraine has revealed the reality of war in its appetite for resources and the relative effectiveness of military units possessing various types of equipment, munitions inventories, and histories of training.

Assessments of potential conflict between the U.S. and Russia or China tend toward theory in peacetime and can underestimate what would be needed to prevail in war. War in its reality can be not just illuminating, but shocking when compared to peacetime estimates. The 2017 National Security Strategy,<sup>14</sup> 2021 Interim National Security Strategic Guidance,<sup>15</sup> 2022 National Security Strategy,<sup>16</sup> and 2022 National Defense Strategy<sup>17</sup> all have recognized that meeting the challenges posed by these two large, well-equipped, and well-resourced countries requires a U.S. force that is modern, ready, and effective in all domains of warfare.

Fiscal year (FY) 2023 continued the Biden Administration's trend of increasing non-defense spending at a higher rate than defense spending. The Administration initially requested \$773 billion for the DOD base discretionary budget, which was a 4.1 percent increase over the previous fiscal year's budget.<sup>18</sup> Continuing a trend from the previous year, this relative frugality stood in contrast to the substantially larger increases requested for other federal agencies with requests for non-defense funding rising 10 percent across the board.<sup>19</sup>

Congressional leaders saw the Administration's proposal as inadequate, and both chambers acted through the appropriations and authorization bills to increase the defense budget by \$45 billion over

the requested amount in order to counter the effects of inflation and accelerate implementation of the National Defense Strategy.<sup>20</sup> This increase represented both a rejection of platform retirements proposed by the Biden Administration and Congress's assessment of what is needed to tackle the challenges and threats faced by our armed forces. For example, the munitions industrial base was strengthened by congressional additions both through additional funding and through the authority to enter into multi-year contracts.

The FY 2023 DOD base discretionary budget was \$816.7 billion.<sup>21</sup> This represents the resources allocated to pay for America's military forces (manpower, equipment, and training); their enabling capabilities (things like transportation, satellites, defense intelligence, and research and development); and their institutional support (bases and stations, facilities, recruiting, and the like).

With the congressional increase, the FY 2023 defense budget was 8 percent higher in nominal terms than the FY 2022 budget.<sup>22</sup> Unfortunately, as in FY 2022, the nation continued to experience levels of inflation in FY 2023 that it had not experienced for 40 years: Despite falling from the massive 7 percent to 9 percent rates experienced in FY 2022, inflation in the middle of FY 2023 still stood at around 4 percent.<sup>23</sup> By increasing fuel, food, raw materials, and labor costs, inflation affects the defense budget as much as it does any household budget. Therefore, the price of merely maintaining our current force structure has risen considerably in the past year and is likely to rise further in the coming years as inflation continues to raise costs.

Adding to these challenges, part of the federal government's response to the coronavirus pandemic was a substantial increase in government spending. Federal outlays jumped from \$4.4 trillion in 2019 to \$6.8 trillion in 2021, and the result was a \$3.1 trillion budgetary deficit in FY 2020 and a \$2.7 trillion deficit in FY 2021.<sup>24</sup> Federal deficit spending was roughly \$1.4 trillion for FY 2022 and \$1.2 trillion for FY 2023—lower than it was during the coronavirus pandemic but hundreds of billions more than it had been in pre-pandemic 2019. This extremely high level of budgetary deficit should shape how the country assesses the federal government's budgetary priorities, especially when added to a national debt that had reached \$32 trillion during FY 2023.<sup>25</sup> The public debt, which has been

building for years, will continue to consume federal taxpayers' dollars and will have to be balanced against all other federal priorities.

The decision to fund national defense at a level that is commensurate with interests and prevailing threats reflects our national priorities and risk tolerance. This *Index* assesses the ability of the nation's military forces to protect vital national security interests within the world *as it is* so that the debate about the level of funding for hard power is better informed.

### Purpose as a Driver in Force Sizing

The Joint Force is used for a wide range of purposes, only one of which is major combat operations. Fortunately, such events have been relatively rare, although they have occurred every 15 years on average.<sup>26</sup> In between (and even during) such occurrences, the military is used to support regional engagement, crisis response, strategic deterrence, and humanitarian assistance as well as to support civil authorities and U.S. diplomacy.

All of the U.S. Unified Geographic Combatant Commands, or COCOMS<sup>27</sup>—Northern Command (NORTHCOM); European Command (EUCOM); Central Command (CENTCOM); Indo-Pacific Command (INDOPACOM); Southern Command (SOUTHCOM); and Africa Command (AFRICOM)—have annual and long-term plans for engaging with countries in their assigned regions. Engagements range from very small unit training events with the forces of a single partner country to larger bilateral and sometimes multilateral military exercises. Such events help to foster working relationships with other countries, acquire a more detailed understanding of regional political-military dynamics and on-the-ground conditions in areas of interest, and signal U.S. security interests to friends and competitors.

To support such COCOM efforts, the services provide forces that are based permanently in their respective regions or that operate in them temporarily on a rotational basis. To make these regional rotations possible, the services must maintain base forces that are large enough to train, deploy, support, receive back, and again make ready a stream of units that ideally is enough to meet validated COCOM demand.

The ratio between time spent at home and time spent away on deployment for any given unit is

known as OPTEMPO (operational tempo), and each service attempts to maintain a ratio that both gives units enough time to educate, train, and prepare their forces and allows the individuals in a unit to maintain some semblance of a healthy home and family life. This ensures that units are fully prepared for the next deployment cycle and that servicemembers do not become “burned out” or suffer adverse consequences in their personal lives because of excessive deployment time.

Experience has shown that a ratio of at least 3:1 (three periods of time at home for every period deployed) is sustainable. If a unit is to be out for six months, for example, it will be home for 18 months before deploying again. Obviously, a service needs enough people, units, ships, and planes to support such a ratio. If peacetime engagement were the primary focus for the Joint Force, the services could size their forces to support these forward-based and forward-deployed demands. Thus, the size of the total force must necessarily be much larger than any sampling of its use at any point in time.

In contrast, sizing a force for major combat operations is an exercise informed by history—how much force was needed in previous wars—and then shaped and refined by analysis of current threats, a range of plausible scenarios, and expectations about what the U.S. can do given training, equipment, employment concept, and other factors. The defense establishment must then balance “force sizing” between COCOM requirements for presence and engagement and the amount of military power (typically measured in terms of combat units and major combat platforms, which inform total end strength) that is thought necessary to win in likely war scenarios.

Inevitably, compromises are made that account for how much military the country is willing to buy. Generally speaking:

- **The Army** sizes to major warfighting requirements.
- **The Marine Corps** focuses on crisis response demands and the ability to contribute to one major war.
- **The Air Force** attempts to strike a balance that accounts for historically based demand across the spectrum because air assets are

shifted fairly easily from one theater of operations to another (“easily” being a relative term when compared to the challenge of shifting large land forces), and any peacetime engagement typically requires some level of air support.

- **The Navy** is driven by global presence requirements. To meet COCOM requirements for a continuous fleet presence at sea, the Navy must have three to four ships in order to have one on station. A commander who wants one U.S. warship stationed off the coast of a hostile country, for example, needs the use of four ships from the fleet: one on station, one that left station and is traveling home, one that just left home and is traveling to station, and one that is otherwise unavailable because of major maintenance or modernization work.

This *Index* focuses on the forces required to win two major wars as the baseline force-sizing metric for the Army, Navy, and Air Force and the one-war-plus-crisis-response paradigm for the Marine Corps. The three large services are sized for global action in more than one theater at a time; the Marines, by virtue of overall size and most recently by direction of the Commandant, focus on one major conflict while ensuring that all Fleet Marine Forces are globally deployable for short-notice, smaller-scale actions.<sup>28</sup> The military’s effectiveness, both as a deterrent against opportunistic competitor states and as a valued training partner in the eyes of other countries, derives from its effectiveness (proven or presumed) in winning wars.

### Our Approach

With this in mind, we assessed the state of America’s military forces as it pertains to their ability to deliver hard power against an enemy in three areas:

- Capability,
- Capacity, and
- Readiness.

**Capability.** Examining the capability of a military force requires consideration of:

- The proper tools (material and conceptual) with the design, performance characteristics, technological advancement, and suitability that the force needs to perform its function against an enemy successfully.
- The sufficiency of armored vehicles, ships, airplanes, and other equipment and weapons to win against the enemy.
- The appropriate variety of options to preclude strategic vulnerabilities in the force and give flexibilities to battlefield commanders.
- The degree to which elements of the force reinforce each other in covering potential vulnerabilities, maximizing strengths, and gaining greater effectiveness through synergies that are not possible in narrowly stovepiped, linear approaches to war.

The capability of the U.S. Joint Force was on ample display in its decisive conventional war victory over Iraq in liberating Kuwait in 1991 and later in the conventional military operation in Iraq to depose Saddam Hussein in 2003. Aspects of its capability have also been seen in numerous other operations undertaken since the end of the Cold War. While the conventional combat aspect of power projection has been more moderate in places like Yugoslavia, Somalia, Bosnia and Serbia, Kosovo, and even against the Taliban in Afghanistan in 2001, the fact that the U.S. military was able to conduct highly complex operations thousands of miles away in austere, hostile environments and sustain those operations as long as required is testament to the ability of U.S. forces to do things that the armed forces of few if any other countries can do.

The most recent evidence of this was seen in the hasty evacuation of civilians from Afghanistan in August 2021 once the Biden Administration ordered the end of U.S. operations in that country. Though subject to severe criticism both during and after its execution, almost all of which had to do with the politics surrounding the decision to withdraw and the context that framed the nature of the operation, the operation itself was an extraordinary feat of military effectiveness within tight time constraints and tremendous pressure. Approximately 124,000

TABLE 6

## Historical U.S. Force Allocation

Troop figures are in thousands.

|  | Korean War | Vietnam War | Persian Gulf War | Operation Iraqi Freedom |
|--|------------|-------------|------------------|-------------------------|
| <b>ARMY</b>  |            |             |                  |                         |
| Total Troop Deployment During Engagement   | 206.3      | 219.3       | 267.0            | 99.7                    |
| Divisions*   | 6          | 7           | 4                | 1                       |
| Reserve Component Divisions Total for Strategic Documents                          | n/a        | n/a         | n/a              | n/a                     |
| Total Army End Strength During Engagement, During Year of Strategy Document Active | 1,313.8    | 1,113.3     | 738.0            | 499.0                   |
| Total Active End Strength Recommendations  | n/a        | n/a         | n/a              | n/a                     |
| <b>NAVY</b>  |            |             |                  |                         |
| Total Fleet During Engagement  | 904        | 770         | 529              | 297                     |
| Aircraft Carriers  | 6          | 5           | 6                | 5                       |
| Carrier Air Wings  | 6          | 5           | 6                | 5                       |
| Large Surface Combatants   | 37         | 14          | 30               | 23                      |
| Small Surface Combatants   | 16         | 47          | 16               | 9                       |
| Attack Submarines  | 4          | 0           | 12               | 12                      |
| Amphibious Vessels   | 34         | 26          | 21               | 7                       |
| Combat Logistics and Support Ships   | 28         | 29          | 45               | 42                      |
| Fighter/Attack Squadrons   | 21         | 43          | 22               | 24                      |
| <b>MARINE CORPS</b>  |            |             |                  |                         |
| Total Troop Deployment During Engagement   | 33.5       | 44.7        | 90.0             | 66.2                    |
| Active Divisions*  | 1          | 2           | 2                | 1                       |
| Reserve Divisions  | n/a        | n/a         | n/a              | n/a                     |
| Marine Expeditionary Force   | 1          | 1           | 1                | 2                       |
| Air Wings Active/Reserve   | 1          | 1           | 1                | 1                       |
| Total Marine Corps End Strength During Engagement by Year of Strategy Document     | 187.0      | 289.0       | 196.3            | 178.0                   |
| Total Recommended End Strength   | n/a        | n/a         | n/a              | n/a                     |
| <b>AIR FORCE</b>   |            |             |                  |                         |
| Bombers or Bomber Squadrons**  | 21         | 23          | 3                | 4                       |
| Fighter Squadrons  | 26         |             | 30               | 30                      |
| Active Fighter Wings   | 7          | 8           | 10               | 10                      |
| Reserve Fighter Wings  |            |             |                  |                         |
| Airlift/Tankers  | 239        | 167         | 388              | 293                     |

\* Figures for engagements are numbers deployed; figures for documents are totals.

\*\* Figures for Air Force bombers for Korean War, Vietnam War, Persian Gulf War, and Iraq are bomber squadrons. All other figures are bombers.

\*\*\* 2014 QDR prescribed nine heavy bomber squadrons, equaling 96 aircraft.

|   | 1993<br>BUR | 1997<br>QDR | 2001<br>QDR | 2006<br>QDR | 2010<br>QDR | 2010<br>Indep.<br>Panel | 2-MRC<br>Paper | 2014<br>QDR | 2014<br>NDP |
|---|-------------|-------------|-------------|-------------|-------------|-------------------------|----------------|-------------|-------------|
| <b>ARMY</b>   |             |             |             |             |             |                         |                |             |             |
| Total Troop Deployment During Engagement  | n/a         | n/a         | n/a         | n/a         | n/a         | n/a                     | n/a            | n/a         | n/a         |
| Divisions*  | 10          | 10          | 10          | 11          | 18          | 11                      | 10             | 10          | n/a         |
| Reserve Component Divisions Total<br>for Strategic Documents                          | n/a         | 5           | 8           | 8           |             | 7                       | 8              | 8           | n/a         |
| Total Army End Strength During Engagement,<br>During Year of Strategy Document Active | 572.0       | 492.0       | 481.0       | 505.0       | 566.0       | 566.0                   | 550.0          | 490.0       | 490.0       |
| Total Active End Strength Recommendations   | n/a         | n/a         | n/a         | 482.4       | n/a         | 1,106.0                 | 600.0          | 450.0       | 490.0       |

|                                       |     |     |     |     |       |     |     |     |     |
|---------------------------------------|-----|-----|-----|-----|-------|-----|-----|-----|-----|
| <b>NAVY</b>                           |     |     |     |     |       |     |     |     |     |
| Total Fleet During Engagement         | 346 | 310 | n/a | n/a | n/a   | 346 | 350 | n/a | 346 |
| Aircraft Carriers                     | 12  | 12  | 12  | 11  | 11    | 11  | 11  | 11  | n/a |
| Carrier Air Wings                     | 12  | 11  | 11  | n/a | 10    | 10  | 10  | 10  | n/a |
| Large Surface Combatants              | 124 | 116 | 116 | n/a | 84-88 | n/a | 120 | 92  | n/a |
| Small Surface Combatants              |     |     |     | n/a | 14-28 | n/a | n/a | 43  | n/a |
| Attack Submarines                     | 55  | 50  | 55  | n/a | 53-55 | 55  | 50  | 51  | n/a |
| Amphibious Vessels                    | 41  | 36  | 36  | n/a | 29-31 | n/a | 38  | 33  | n/a |
| Combat Logistics and<br>Support Ships | 65  | n/a | n/a | n/a | 58    | n/a | 75  | n/a | n/a |
| Fighter/Attack Squadrons              | 33  | 30  | 30  | n/a | 30    | 30  | 30  | 30  | n/a |

|   |       |       |       |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <b>MARINE CORPS</b>   |       |       |       |       |       |       |       |       |       |
| Total Troop Deployment During Engagement  | n/a   | n/a   | n/a   | n/a   | n/a   | n/a   | n/a   | n/a   | n/a   |
| Active Divisions*   | 4     | 3     | 3     | n/a   | 3     | n/a   | n/a   | 3     | n/a   |
| Reserve Divisions   | 1     | 1     | 1     | n/a   | 1     | n/a   | n/a   | 1     | n/a   |
| Marine Expeditionary Force  | 3     | 3     | 3     | n/a   | 3     | 3     | 3     | 2     | n/a   |
| Air Wings Active/Reserve  | n/a   | 4     | 4     | n/a   | 4     | n/a   | n/a   | 4     | n/a   |
| Total Marine Corps End Strength During<br>Engagement by Year of Strategy Document | 174.0 | 174.0 | 173.0 | 180.0 | 202.0 | 202.0 | 196.0 | 182.0 | 182.0 |
| Total Recommended<br>End Strength   | n/a   | n/a   | n/a   | 175.0 | n/a   | 243.0 | 202.0 | 182.0 | 182.0 |

|                               |     |     |     |     |      |      |       |       |     |
|-------------------------------|-----|-----|-----|-----|------|------|-------|-------|-----|
| <b>AIR FORCE</b>              |     |     |     |     |      |      |       |       |     |
| Bombers or Bomber Squadrons** | 200 | 187 | 112 | n/a | 96   | 180  | 200   | 96*** | n/a |
| Fighter Squadrons             | 54  | 54  | 46  | n/a | 42   | 66   | 54    | 48    | n/a |
| Active Fighter Wings          | 13  | 12+ | 15  | n/a | n/a  | 20   | 20    | 9     | n/a |
| Reserve Fighter Wings         | 7   | 8   | 12  | n/a | n/a  | n/a  |       | 7     | n/a |
| Airlift/Tankers               | n/a | n/a | n/a | n/a | 1023 | 1023 | 1,000 | 954   | n/a |

civilians were evacuated via the Hamid Karzai International Airport, situated on the outskirts of Kabul, during the latter two weeks of August. The effort involved 6,000 troops on the ground and approximately 800 aircraft from 30 countries (250 of which were U.S. Air Force transports), all coordinated and controlled by U.S. military personnel.<sup>29</sup> No other country could have executed such a mission under such conditions.

A modern “major combat operation”<sup>30</sup> along the lines of those upon which Pentagon planners base their requirements would feature a major opponent possessing modern integrated air defenses; naval power (surface and undersea); advanced combat aircraft (to include bombers); a substantial inventory of short-range, medium-range, and long-range missiles; current-generation ground forces (tanks, armored vehicles, artillery, rockets, and anti-armor weaponry); cruise missiles; and (in some cases) nuclear weapons. Such a situation involving an actor capable of threatening vital national interests would present a challenge that is comprehensively different from the challenges that the U.S. Joint Force has faced in past decades.

Since 2018, given its focus on counterinsurgency, stability, and advise-and-assist operations since 2004 and the 2018 NDS directive to prepare for conflict in an era of great-power competition, the military community has focused on its suitability and readiness for major conventional warfare.<sup>31</sup> In general terms, this focus has been sustained through the release of the 2022 NDS, perhaps spurred by the observed realities of the Russia–Ukraine war and China’s rapid expansion of its military capabilities and activities.

- The Army in particular has noted the need to reengage in training and exercises that feature larger-scale combined arms maneuver operations, especially to ensure that its higher headquarters elements are up to the task.
- The Marine Corps has undertaken a dramatic restructuring to posture itself more effectively for high-end warfare against a major opponent, focusing specifically on China and the littorals of the Indo-Pacific but also appreciating that its new capabilities will be broadly applicable elsewhere.

- Both the Navy and the Air Force have acknowledged the evolved threat environment that will demand more of them in the coming decade than they have had to deal with during the past 20 years.

This *Index* ascertains the relevance and health of military service capabilities by looking at such factors as the average age of equipment, the generation of equipment relative to the current state of competitor efforts as reported by the services, and the status of replacement programs that are meant to introduce more updated systems as older equipment reaches the end of its programmed service life. While some of the information is quite quantitative, other factors could be considered judgment calls made by acknowledged experts in the relevant areas of interest or addressed by senior service officials when providing testimony to Congress or examining specific areas in other official statements.

It must be determined whether the services possess capabilities that are relevant to the modern combat environment.

**Capacity.** The U.S. military must have a sufficient quantity of the right capability or capabilities. When speaking of platforms such as planes and ships, a troubling and fairly consistent trend within U.S. military acquisition characterizes the path from requirement to fielded capability. Along the way to acquiring the capability, several linked things happen that result in far less of a presumed “critical capability” than was supposedly required.

- The military articulates a requirement that the manufacturing sector attempts to satisfy.
- “Unexpected” technological hurdles arise that take longer and much more money to solve than anyone envisioned.
- Programs are lengthened, and cost overruns are addressed, usually with more money.
- Then the realization sets in that the country either cannot afford or is unwilling to pay the cost of acquiring the total number of platforms originally advocated. The acquisition goal is adjusted downward, if not canceled altogether, and the military finally fields fewer platforms



## U.S. Military Power: Summary

VERY WEAK

WEAK

MARGINAL

STRONG

VERY STRONG

at a higher cost per unit than it originally said it needed to be successful in combat.

As deliberations proceed toward a decision on whether to reduce planned procurement, they rarely focus on and quantify the increase in risk that accompanies the decrease in procurement.

Something similar happens with force structure size: the number of units and total number of personnel the services say they need to meet the objectives established by the Commander in Chief and the Secretary of Defense in their strategic guidance.

- The Marine Corps has stated that it needs 27 infantry battalions to fully satisfy the validated requirements of the regional Combatant Commanders, yet it currently fields only 22 in order to make resources available for experimentation and modernization and to sustain its contributions to U.S. Special Operations Command (investing a regiment in Marine Forces Special Operations Command).<sup>32</sup>
- In 2012, the Army was building toward 48 brigade combat teams, but incremental budget cuts reduced that number over time to 31—less than two-thirds the number that the Army originally thought was necessary.
- The Navy has produced various assessments of fleet size since the end of the Cold War, from 313 ships to 372 ships with some working estimates as high as 500 manned ships.

Older equipment can be updated with new components to keep it relevant, and commanders can employ fewer units more expertly for longer periods of time in an operational theater to accomplish an objective. At some point, however, sheer numbers of updated, modern equipment and trained, fully manned units are going to be needed to win in battle against a credible opponent when the crisis is profound enough to threaten a vital national interest.

Capacity (numbers) can be viewed in at least three ways:

- Compared to a stated objective for each category by each service,
- Compared to amounts required to complete various types of operations across a wide range of potential missions as measured against a potential adversary, and
- As measured against a set benchmark for total national capability.

This *Index* employs the two-MRC metric as a benchmark for most of the force. This benchmark is the *minimum* standard for U.S. hard-power capacity because one will never be able to employ 100 percent of the force at any given time. Some percentage of the force will always be unavailable because of long-term maintenance overhaul, especially for Navy ships; unit training cycles; employment in myriad engagement and small-crisis response tasks that continue even during major conflicts; a standing commitment with allies to maintain U.S. forces in a given country or region; and the need to keep some portion of the force uncommitted to serve as a strategic reserve.

The historical record shows that, on average, the U.S. Army commits 21 BCTs to a major conflict; thus, a two-MRC standard would require that 42 BCTs be available for actual use. But an Army built to field only 42 BCTs would also be an Army that could find itself entirely committed to war, leaving nothing back as a strategic reserve to replace combat losses or to handle other U.S. security interests. Although new technologies and additional capabilities have made current BCTs more capable than those they replaced, one thing remains the same: Today's BCT, like its predecessors, can be committed only to one place at a time and must be able to account for combat losses, especially if it engages a similarly modernized enemy force. Thus, regardless of modernity, numbers still matter.

Again, this *Index* assesses only the Active component of the service, albeit with full awareness that the Army also has Reserve and National Guard components that together account for half of the

total Army. The additional capacity needed to meet these “above two-MRC requirements” could be handled by these other components or mobilized to supplement Active-component commitments. In fact, this is how the Army thinks about meeting operational demands and is at the heart of the long-running debate within the total Army about the roles and contributions of its various components. A similar situation exists within the Air Force and Marine Corps.

The balance among Active, Reserve, and Guard elements is beyond the scope of this study. Our focus is on establishing a minimum benchmark for the capacity needed to handle a two-MRC requirement.

We conducted a review of the major defense studies (1993 BUR, QDR reports, and independent panel critiques) that are publicly available,<sup>33</sup> as well as modern historical instances of major wars (Korea, Vietnam, Gulf War, Operation Iraqi Freedom), to see whether there was any consistent trend in U.S. force allocation. The results of our review are presented in Table 6. To this we added 20 percent, both to account for forces and platforms that are likely to be unavailable and to provide a strategic reserve to guard against unforeseen demands.

Summarizing the totals, this *Index* concluded that a Joint Force capable of dealing with two MRCs simultaneously or nearly simultaneously would consist of:

- **Army:** 50 BCTs.
- **Navy:** at least 400 ships and 624 strike aircraft.
- **Air Force:** 1,200 fighter/attack aircraft.
- **Marine Corps:** 30 battalions.

America’s security interests require that the services have the capacity to handle two major regional conflicts successfully.

**Readiness.** The consequences of the sharp reductions in funding mandated by sequestration from 2011 until 2021 caused military service officials, senior DOD officials, and even Members of Congress to warn of the dangers of recreating the “hollow force” of the 1970s when units existed on paper but were staffed at reduced levels, minimally trained, and woefully ill-equipped.<sup>34</sup> To avoid this, the services traded quantity/capacity and

modernization to ensure that what they do have is “ready” for employment.

Supplemental funding in FY 2017, a higher topline in FY 2018, and sustained increases in FY 2019 and FY 2020 helped to stop the bleeding and enabled the services to plan and implement readiness recovery efforts. Massive federal spending in response to the COVID-19 pandemic in calendar years 2020 and 2021 led to fiscal pressure on defense accounts in future years, but gains in readiness were preserved during FY 2020.

Ensuring adequate readiness in FY 2021 was difficult given the challenges created by COVID-19 during the preceding year. In FY 2022, the services continued their effort to find an appropriate balance among capability, capacity, and readiness, at first benefiting from a reduction in combat operations and the easing of COVID-related restrictions and disruptions but then forced to contend with a loss in spending power caused by rising inflation. Continuing inflationary problems presented a new budgeting challenge to the services with the dramatic spike in interest rates, which increased from 0.0 percent–0.25 percent in FY 2022 to as high as 5.0 percent–5.25 percent in FY 2023.<sup>35</sup>

It is one thing to have the right capabilities to defeat the enemy in battle. It is another thing to have enough of those capabilities to sustain operations and many battles against an enemy over time, especially when attrition or dispersed operations are significant factors. But sufficient numbers of the right capabilities are rather meaningless if the force is not ready to engage in the task.

**Scoring.** In our final assessments, we tried very hard not to convey a higher level of precision than we think is achievable using unclassified, open-source, publicly available documents; not to reach conclusions that could be viewed as based solely on assertions or opinion; and not to rely solely on data and information that can be highly quantified. Simple numbers, while important, do not tell the whole story.

We believe that the logic underlying our methodology is sound. This *Index* draws from a wealth of public testimony from senior government officials, from the work of recognized experts in the defense and national security analytic community, and from historical instances of conflict that seemed most appropriate to this project. It then considers several questions, including:

- How does one place a value on the combat effectiveness of such concepts as Air-Sea Battle, Multi-Domain Operations, Littoral Operations in a Contested Environment, Distributed Maritime Operations, Network-centric Operations, or Joint Operational Access when they have not been tested in battle?<sup>36</sup>
- Is it entirely possible to assess accurately (1) how well a small number of newest-generation ships or aircraft will fare against a much larger number of currently modern counterparts when (2) U.S. forces are operating thousands of miles from home, (3) orchestrated with a particular operational concept, and (4) the enemy is leveraging a “home field advantage” that includes strategic depth and much shorter and perhaps better protected lines of communication and (5) might be pursuing much dearer national objectives than the U.S. is pursuing so that the political will to conduct sustained operations in the face of mounting losses might differ dramatically?
- How does one neatly quantify the element of combat experience, the erosion of experience as combat operation events recede in time and those who participated in them leave the force, the health of a supporting workforce, the value of “presence and engagement operations,” and the related force structures and patterns of

deployment and employment that presumably deter war or mitigate its effects if it does occur?

New capabilities such as unmanned systems, cyber tools, hypervelocity platforms and weapons, and the use of artificial intelligence to achieve a better understanding of operations and orchestrate them more effectively have the potential to change military force posture calculations. At the present time, however, they are not realized in any practical sense.

This *Index* is focused on the primary purpose of military power—to defeat an enemy in combat—and the historical record of major U.S. engagements for evidence of what the U.S. defense establishment has thought was necessary to execute a major conventional war successfully. To this we added the two-MRC benchmark; on-the-record assessments of what the services themselves are saying about their status relative to validated requirements; and the analysis and opinions of various experts, both in and out of government, who have covered these issues for many years.

Taking everything together, we rejected scales that would imply extraordinary precision and settled on a scale that conveys broader characterizations of status that range from very weak to very strong. Ultimately, any such assessment is a judgment call informed by quantifiable data, qualitative assessments, thoughtful deliberation, and experience. We trust that our approach makes sense, is defensible, and is repeatable.

## Endnotes

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5. See Lloyd J. Austin III, Secretary of Defense, *2022 National Defense Strategy of the United States of America Including the 2022 Nuclear Posture Review and the 2022 Missile Defense Review*, U.S. Department of Defense, <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF> (accessed June 27, 2023).
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7. President Joseph R. Biden, Jr., *Interim National Security Strategic Guidance*, The White House, March 2021, p. 9, <https://www.whitehouse.gov/wp-content/uploads/2021/03/NSC-1v2.pdf> (accessed June 27, 2023).
8. See Biden, *National Security Strategy*, p. 20, and Austin, *2022 National Defense Strategy of the United States of America*, pp. 2, 4–5, and 8–11.
9. The United States has not had to contend in combat with any credible air force since the Vietnam War, but U.S. Air Force planners are increasingly concerned about an enemy's ground-based, anti-air missile capability. Naval planners are much more concerned about ship-based, air-based, and shore-based anti-ship cruise missiles than they are about the number of conventional surface combatants armed with large-caliber guns that an enemy navy has, and ground force planners have to consider the numbers and types of guided anti-armor weapons that an enemy possesses and whether an opposing force has guided artillery, mortar, or rocket capabilities. Guided/precision weapons are typically less expensive (by orders of magnitude) than the platforms they target, which means that countries can produce far more guided munitions than primary weapons platforms. Adding this to the rise of unmanned platforms capable of carrying anti-platform weapons makes the threat environment even more complicated. Some examples: Harpoon ASCM (\$2 million)/DDG-51 *Arleigh Burke*-Class destroyer (\$2 billion); AT4 anti-armor weapon (\$1,500)/M1A1 Abrams main battle tank (\$9 million); 120mm guided mortar round (\$10,000) or 155mm guided artillery round (\$100,000)/M198 155mm howitzer (\$500,000); S-300 anti-air missile (\$1 million)/F/A-18 Hornet (\$70 million) or F-35A Lightning II (\$78 million).
10. The use of low-cost drones to attack tanks and other armored vehicles during the 2020 war between Armenia and Azerbaijan proved devastatingly effective, a precursor to what has been seen in the Russia-Ukraine War on a dramatically larger scale. See Benjamin Brimelow, "A Brief, Bloody War in a Corner of Asia Is a Warning About Why the Tank's Days of Dominance May Be Over," *Business Insider*, November 24, 2020, <https://www.businessinsider.in/international/news/a-brief-bloody-war-in-a-corner-of-asia-is-a-warning-about-why-the-tanks-days-of-dominance-may-be-over/articleshow/79399695.cms> (accessed June 27, 2023). In late June 2021, U.S. forces conducted air strikes against Iranian-backed militia groups in Syria that had been using drones to attack U.S. forces in the region—further evidence of the proliferation of these unmanned systems that enable non-state groups to attack state forces with some level of effectiveness. See David Martin and Tucker Reals, "U.S. Airstrikes Hit Iranian-Backed Militias in Iraq and Syria," CBS News, updated June 28, 2021, <https://www.cbsnews.com/news/us-airstrikes-iran-linked-militias-iraq-syria/> (accessed June 27, 2023). The war in Ukraine has seen a dramatic expansion in the use of "drones" (unmanned aerial systems) from long-range platforms designed as weapons of war to very small, commercially available systems that have been adapted for such use. For one of many reports on this topic, see Joe Tidy, "Ukraine Rapidly Expanding Its 'Army of Drones' for Front Line," BBC News, April 26, 2023, <https://www.bbc.com/news/technology-65389215> (accessed June 27, 2023).
11. For a detailed discussion of this force, see Richard J. Dunn III, "America's Reserve and National Guard Components: Key Contributors to U.S. Military Strength," in *2016 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2015), pp. 61–73, [https://s3.amazonaws.com/ims-2016/PDF/2016\\_Index\\_of\\_US\\_Military\\_Strength\\_FULL.pdf](https://s3.amazonaws.com/ims-2016/PDF/2016_Index_of_US_Military_Strength_FULL.pdf). For the percentage of U.S. military capability that resides in the Guard/Reserve, see *ibid.*, p. 63.
12. One example of force balancing was the Army's Aviation Restructuring Initiative, in which the active-duty force sought to redistribute certain rotorcraft platforms among units of the active-duty Army and the National Guard. The Guard has contended that this plan would reduce the capabilities it has gained during recent combat engagements, such as its pilots' proficiency in flying Apache helicopters. For more on this issue, see U.S. Government Accountability Office, *Force Structure: Army's Analyses of Aviation Alternatives*, GAO-15-430R, April 27, 2015, <http://www.gao.gov/assets/670/669857.pdf> (accessed June 27, 2023), and Enclosure 1, "Force Structure: Army's Analysis of Aviation Alternatives, Briefing for Congressional Defense Committees," updated April 27, 2015, in *ibid.*, pp. 8–44.
13. Thomas W. Spoehr, "U.S. Army," in *2021 Index of U.S. Military Strength*, ed. Dakota L. Wood (Washington: The Heritage Foundation, 2021), pp. 362 and 368, [https://www.heritage.org/sites/default/files/2020-11/2021\\_IndexOfUSMilitaryStrength\\_ASSESSMENT\\_POWER\\_ARMY.pdf](https://www.heritage.org/sites/default/files/2020-11/2021_IndexOfUSMilitaryStrength_ASSESSMENT_POWER_ARMY.pdf).

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15. Biden, *Interim National Security Strategic Guidance*, p. 14.
16. Biden, *National Security Strategy*, pp. 3, 20–21, and 23–27.
17. Austin, *2022 National Defense Strategy of the United States of America*, pp. iii, 2–5, and 10.
18. Figure 11, “Department of Defense Budget,” in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, *United States Department of Defense Fiscal Year 2023 Budget Request: Defense Budget Overview*, April 2022, p. 1-3, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023\\_Budget\\_Request\\_Overview\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023_Budget_Request_Overview_Book.pdf) (accessed June 27, 2023).
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21. Figure 11, “Department of Defense Budget,” in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, *United States Department of Defense Fiscal Year 2024 Budget Request: Defense Budget Overview*, March 2023, p. 1-3, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024\\_Budget\\_Request\\_Overview\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024_Budget_Request_Overview_Book.pdf) (accessed June 27, 2023).
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24. Table 1.1, “Summary of Receipts, Outlays, and Surpluses or Deficits (–): 1789–2027,” in Executive Office of the President, Office of Management and Budget, *Budget of the U.S. Government, Fiscal Year 2023: Historical Tables*, [https://www.whitehouse.gov/wp-content/uploads/2022/03/hist01z1\\_fy2023.xlsx](https://www.whitehouse.gov/wp-content/uploads/2022/03/hist01z1_fy2023.xlsx) (accessed June 27, 2023).
25. U.S. Department of the Treasury, Fiscal Data, “What Is the National Debt?” <https://fiscaldata.treasury.gov/americas-finance-guide/national-debt/> (accessed June 27, 2023).
26. Since World War II, the U.S. has fought four major wars: the Korean War (1950–1953); the Vietnam War (1965–1973); the Gulf War/Operation Desert Shield/Desert Storm (1990–1991); and the Iraq War/Operation Iraqi Freedom (2003–2011). Operation Enduring Freedom (OEF), commenced immediately following the terrorist attacks of September 11, 2001, was focused primarily on combat operations in Afghanistan but included related actions against terrorist organizations worldwide. OEF was concluded in 2014 when combat operations in Afghanistan were shifted to advisory support operations under the name Operation Freedom’s Sentinel. While OEF was not at the same level of intensity as the other named wars, its duration and demand for a constant rotation of forces, to include continuous airpower support, took a similar toll in terms of wear on equipment, consumption of fuel and ammunition, and repeated deployments by personnel.
27. U.S. Space Command (USSPACECOM) is also considered a geographic command, but within the context of this discussion, SPACECOM’s interactions with other countries and the extent to which it must deal with units and peoples operating on its terrain are very different from those of terrestrial commands.
28. In previous editions of the *Index*, the capacity of the Marine Corps was assessed against a two-war requirement of 36 battalions: a historical average of 15 battalions for a major conflict (twice that for two) and a 20 percent buffer, bringing the total to 36. The Corps has consistently maintained that it is a one-war force and has no intention of growing to the size needed to fight two wars. Its annual budget requests and top-level planning documents reflect this position. Having assessed that the Indo-Pacific region will continue to be of central importance to the U.S., that China is a more worrisome “pacing threat” than any other competitor, and that the Joint Force lacks the ability to operate within the range of intensely weaponized, layered defenses featuring large numbers of precision-guided munitions, the Corps is reshaping itself to optimize its capabilities and organizational structures for this challenge. This *Index* concurs with this effort but assesses that the Corps will still need greater capacity to succeed in war in the very circumstances for which the Marines believe they must prepare. For a detailed examination of the current state of the Corps, see Dakota Wood, “The U.S. Marine Corps: A Service in Transition,” Heritage Foundation *Backgrounder* No. 3501, June 16, 2020, [https://www.heritage.org/sites/default/files/2020-06/BG3501\\_0.pdf](https://www.heritage.org/sites/default/files/2020-06/BG3501_0.pdf).
29. Courtney Kube and Teaganne Finn, “U.S. to Send 1,000 More Troops to Kabul After Afghan Government Collapses,” NBC News, August 15, 2021, <https://www.nbcnews.com/politics/national-security/u-s-send-additional-1-000-troops-kabul-amid-afghan-n1276881> (accessed June 27, 2023), and Rachel S. Cohen, “The Air Force Evacuated 124,000 People from Afghanistan, but Its Work Still Isn’t Done,” *Military Times*, September 24, 2021, <https://www.militarytimes.com/news/your-air-force/2021/09/24/the-air-force-evacuated-124000-people-from-afghanistan-but-its-work-still-isnt-done/> (accessed June 27, 2023).
30. Defense references to war have varied over the past few decades from “major combat operation” (MCO) and “major theater war” (MTW) to the current “major regional contingency” (MRC). Arguably, there is a supporting rationale for such shifts as planners attempt to find the best words to describe the scope and scale of significant military efforts, but the terms are basically interchangeable.
31. Mattis, *Summary of the 2018 National Defense Strategy of the United States of America*, p. 4.

32. General David H. Berger, Commandant of the Marine Corps, “Force Design 2030,” March 2020, pp. 7–8, <https://www.hqmc.marines.mil/Portals/142/Docs/CMC38%20Force%20Design%202030%20Report%20Phase%20I%20and%20II.pdf?ver=2020-03-26-121328-460> (accessed June 27, 2023).
33. The Department of Defense, through the Joint Staff and Geographic Combatant Commanders, manages a relatively small set of real-world operational plans (OPLANS) that are focused on specific situations in which the U.S. feels it is most likely to go to war. These plans are reviewed and updated regularly to account for changes in the Joint Force or the presumed enemy. They are highly detailed and account not only for the amount of force the U.S. expects that it will need to defeat the enemy, but also for which specific units would deploy; how the force would actually flow into the theater (the sequencing of units); what ports and airfields it would use; how much ammunition, fuel, and other supplies it would need initially; how much transportation or “lift” would be needed to get the force there (by air, sea, trucks, or rail); and the basic plan of attack. The Pentagon also routinely develops, explores, and refines various notional planning scenarios so that it can better understand the implications of different sorts of contingencies, which approaches might be more effective, how much of what type of force might be needed, and the regional issue or issues for which there would have to be an accounting. These types of planning events inform service efforts to develop, equip, train, and field military forces that are up to the task of defending America’s national security interests. All of these efforts and their products are classified national security information and therefore not available to the public.
34. For more on the potential for a hollow force, see Association of the United States Army, “Preventing a Hollow Force Is Army’s Top Priority,” May 25, 2017, <https://www.ausa.org/news/preventing-hollow-force-army%E2%80%99s-top-priority> (accessed June 27, 2023), and J. V. Venable, “America’s Air Force Is in Bad Shape,” *National Review*, June 13, 2017, <http://www.nationalreview.com/article/448556/us-air-force-weakened-funding-cuts-shrinking-workforce-aging-fleet-hurt-preparedness> (accessed June 27, 2023).
35. Chart, “Federal Funds Effective Rate,” in Federal Reserve Bank of St. Louis, Fred Economic Data, “Federal Funds Effective Rate (FEDFUNDS),” updated June 1, 2023, <https://fred.stlouisfed.org/series/fedfunds> (accessed June 27, 2023).
36. While some of these concepts are dated, they serve as examples to illustrate that the military is constantly at work improving its understanding of operational challenges and how best to use what it has—or to inform developmental efforts—to resolve such issues. The point, however, is that any concept remains unproven until it is employed in war. Consequently, assessing its actual effectiveness is impossible.

# U.S. Army

Thomas W. Spoehr

**T**he U.S. Army is America’s primary agent for the conduct of land warfare. Although it is capable of all types of operations across the range of military operations and support to civil authorities, its chief value to the nation is its ability to defeat and destroy enemy land forces in battle.

The Army is engaged throughout the world in protecting and advancing U.S. interests. As of April 19, 2023, the Army had “137,000 soldiers in over 140 countries” supporting America’s security interests.<sup>1</sup> Most notably, it has deployed significant forces to NATO countries as a deterrent to further aggression by Russia. As of May 2, 2023, 43,000 soldiers were deployed to Europe bolstering NATO and demonstrating U.S. commitment to the region.<sup>2</sup>

On May 2, 2023, speaking of the deployments to Europe, Secretary of the Army Christine Wormuth and then-Army Chief of Staff General James C. McConville testified that:

In Poland, the Army has forward-stationed the V Corps Headquarters Forward Command Post—the first permanent U.S. forces on NATO’s eastern flank. We are maintaining a substantial rotational force in Poland, including an Armored Brigade Combat Team (ABCT), combat aviation brigade, and a division headquarters. In Romania, we have headquartered a rotational brigade combat team, supporting an additional maneuver force on the eastern flank. In the Baltics, we have enhanced our rotational deployments—which include armored, aviation, air defense, and special operations forces—to reinforce Baltic security, enhance interoperability, and demonstrate the flexibility and combat readiness of U.S. forces.<sup>3</sup>

The Army, like the other military services, finds itself under extraordinary operational and financial pressure. In some cases, advances in firepower like ballistic and cruise missiles, electronic warfare capabilities, and loitering munitions delivered by drones fielded by adversaries like China, Russia, and Iran have outpaced the U.S. Army’s capabilities. Information-age warfare requires new levels of speed and precision in Army sensor-to-shooter chains. Autonomy is changing the character of warfare, and the Army has developed some bold ideas about how to take advantage of this technology, but today they are aspirational.

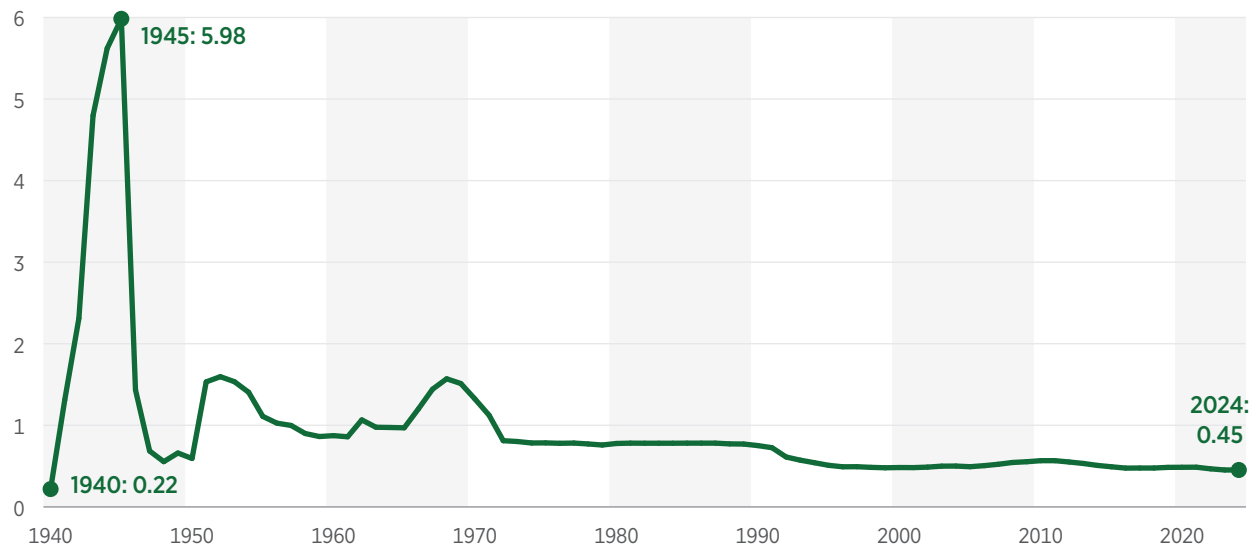
In her initial message to the Army, Secretary Wormuth set out six objectives. The first and arguably most important is to “put the Army on a sustainable strategic path amidst this uncertainty.” Wormuth acknowledged that the Army is “facing increased fiscal pressures,” and while the objective of “a sustainable strategic path” is noble and well-founded, it is not at all clear how the Army will be able to find such a path given its significant and continuing year-over-year losses in buying power.<sup>4</sup>

When official inflation is factored in, the Army has cumulatively lost over \$74 billion in buying power from fiscal year (FY) 2019 to the President’s Budget Request for FY 2024. If Army budgets since 2019 had merely kept up with inflation, the request for FY 2024 would have been \$210.9 billion. Instead, the requested budget was \$185.5 billion.<sup>5</sup> Signs of budget strain are clearly visible in the Army’s proposal to cut large procurement programs such as Paladin Integrated Management (PIM) (reduced by \$211 million from FY 2023); Stryker upgrades (reduced by \$277 million from FY 2023); and Abrams tank upgrades (reduced by \$549 million from FY 2023).<sup>6</sup>

CHART 11

## Army End Strength Lowest Since 1940

END STRENGTH/FULL-TIME EMPLOYEES, IN MILLIONS



**SOURCE:** Table 7-5, “Department of Defense Manpower,” in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), *National Defense Budget Estimates for FY 2024*, May 2023, pp. 288–290, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24\\_Green\\_Book.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY24_Green_Book.pdf) (accessed September 14, 2023).

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Arguments are being made that America no longer needs a strong modern Army because, for example, China is largely a maritime threat, but such arguments ignore history.<sup>7</sup> We need to look no further than the ongoing war in Europe between Russia and Ukraine to remember that capable land power is an enduring need for the United States.

America has a horrible record of predicting where it will fight its next war. As former Secretary of Defense Robert Gates famously said:

When it comes to predicting the nature and location of our next military engagements, since Vietnam, our record has been perfect. We have never once gotten it right, from the Mayaguez to Grenada, Panama, Somalia, the Balkans, Haiti, Kuwait, Iraq, and more—we had no idea a year before any of these missions that we would be so engaged.<sup>8</sup>

America should not be willing to gamble that the next conflict will be in the Indo-Pacific and

put all our eggs in one basket—largely naval—and ignore the continuing need for land power that would be essential in many regions and contexts. Many overlook the fact that great-power competition with China and Russia is a global contest, which means that we face the enduring need to counter aggression wherever it may occur, not just within the territory or waters of China or Russia. All of this reinforces the reality that America has a long-term need for modernized, sufficiently sized land power.

**An Army Recruiting Crisis.** In its FY 2023 budget request, the Army asked for and received a cut of 12,000 in its Regular Army end strength from 485,000 to 473,000. Later in 2023, based on a rapidly deteriorating recruiting forecast, the Army requested that its end strength be lowered by an additional 21,000 to 452,000 for a total of 33,000 compared to its original request for that year. This extraordinary move reflects the dire nature of the recruiting crisis facing both the Army and, to a degree, the other services as well.<sup>9</sup> Pentagon leaders



testified in April 2023 that “[t]he Army, Navy, and Air Force will not make enlistment goals this year.”<sup>10</sup>

The Army is facing a recruiting crisis the likes of which it has not experienced since the transition to the All-Volunteer Force in 1973.<sup>11</sup> Since 2018, the Army has been missing its recruiting goals and making up the difference with strong numbers of reenlistments. Now facing extraordinary financial pressure and in order to save money, it has been forced to face reality and cut spaces for servicemembers that it does not anticipate being able to recruit. The reasons for this crisis are many.

- The percentage of Americans that qualify for military service without a waiver dropped from 29 percent in 2017 to 23 percent in 2022.
- The predominant factor in disqualification is obesity.<sup>12</sup>
- Low unemployment makes recruiting difficult, and as this book was being prepared, the U.S. unemployment rate was 3.5 percent.<sup>13</sup>
- Finally, for a variety of reasons that are beyond the scope of this study, fewer Americans are expressing a desire to serve in the armed forces.<sup>14</sup>

The results of this recruiting crisis include lower manning in Army formations, critical shortages in certain career fields, and lower overall readiness. If the crisis is not ameliorated, its longer-term implications are even more consequential.

**Chronic Underfunding.** The U.S. Army is currently the world’s most powerful army in terms of the equipment it uses and the combat effectiveness of its formations, but it is also too small and insufficiently modern to meet even the modest requirements of the 2022 National Defense Strategy (NDS),<sup>15</sup> much less to handle two major regional contingencies (MRCs) simultaneously, which many experts believe is necessary.<sup>16</sup>

Even though the conflict in Iraq has ended and the military was withdrawn from Afghanistan, the Army’s focus on counterinsurgency during the period from 2001 to 2016 essentially precluded the service from modernizing the key combat capabilities that it needs now for near-peer competition. In 2011, for example, the Army cancelled its only mid-tier air defense program, the Surface Launched Advanced

Medium-Range Air-to-Air Missile (SLAMRAAM), based on its assessment that it would not face a threat from the air in the foreseeable future.<sup>17</sup> In 2022, the Army contracted to buy from Norway largely the same system, the National Advanced Surface-to-Air Missile System (NASAMS), that it cancelled in 2011, now to support Ukraine.<sup>18</sup>

The Army’s last major modernization efforts occurred in the 1980s with the fielding of the M-1 Abrams Tank, the M-2 Bradley Fighting Vehicle, and the Blackhawk and Apache helicopters. As General McConville has cogently argued, “the Army is changing to meet our future challenges. These changes cannot happen through incremental improvements. We must transform the Army, and the time is now.”<sup>19</sup> This implies a modernization effort contemporary with the current threat environment rather than that of the Cold War and an updating of warfighting concepts not rooted in the Cold War but developed and experienced during nearly two decades of counterinsurgency operations.

The Army’s ability to transition from counterinsurgency operations was further constrained by a period of fiscal austerity that began with the Budget Control Act (BCA) of 2011 and lasted for ten years.<sup>20</sup> The inability to fund what was needed led to difficult across-the-board trade-offs in equipment, manpower, and operations accounts. Downward budget pressure drove the Department of Defense (DOD) in 2014 to consider cutting the Army’s Active component end strength from more than 500,000 to 420,000. If implemented, this would have resulted in “the smallest number of troops since before the Second World War.”<sup>21</sup> Multiple equipment modernization programs were cancelled.

The change of Administrations in 2017 forestalled those cuts in end strength. However, the addition of billions of dollars by Congress and the Trump Administration, while it served to arrest the decline of the Army and significantly improve unit readiness, was not sufficient to modernize or significantly increase the size of the force.<sup>22</sup>

**Uncertain Strategic Direction.** The Biden Administration’s National Security Strategy, published in October 2022, was strangely silent on the topic of military force; in fact, the U.S. Army does not appear at all in the document. The National Defense Strategy similarly contains little useful guidance with respect to the Administration’s views on the Army and its role in defending U.S. national interests.<sup>23</sup> As

TABLE 7

## Brigade Combat Teams Deployed to Europe in Support of Ukraine

The addition of three units more than doubles the Army's presence in Europe.

| DEPLOYED TO EUROPE TO SUPPORT UKRAINE DETERRENCE* |  |
|---|--|
| Region  | Unit   |
| Europe  | 2nd Brigade Combat Team, 3rd Infantry Division   |
| Europe  | 2nd Brigade Combat Team, 1st Armored Division    |
| Romania   | 1st Brigade Combat Team, 101st Airborne Division |

| UNITS NORMALLY PRESENT IN EUROPE |                                   |
|----------------------------------|-----------------------------------|
| Region                           | Unit                              |
| Germany                          | 2nd Cavalry Regiment              |
| Italy                            | 173rd Infantry Brigade (Airborne) |

\* As of July 2023.

**NOTE:** A Brigade Combat Team is comprised of approximately 4,500 soldiers.

### SOURCES:

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- U.S. Army Europe and Africa, "U.S. Army Europe and Africa Units," <https://www.europeafrica.army.mil/Units/> (accessed September 11, 2023).

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but one consequence, this absence of clarity in mission, prioritization, and even value as they related to land power has not helped the Army to make a compelling case for programs, capacity, and focus.

**Loss of Buying Power.** Despite relatively broad agreement that the DOD budget needed real growth of 3 percent to 5 percent to avoid a strategy–budget mismatch,<sup>24</sup> the Army budget topline did not meet that target in FY 2019 and has not done so since.

Of all the services, the Army has fared the worst in terms of resources. Its funding levels plateaued with the FY 2020 budget and since then have declined in constant dollars. The Army received approximately \$181 billion in FY 2019, \$186 billion in FY 2020, \$177 billion in FY 2021, \$185 billion in FY 2022, and \$185 billion for FY 2023 and requested approximately \$185 billion for FY 2024, amounting to a relatively flat budget over the past half-decade while the costs of manpower, matériel, and energy have increased.<sup>25</sup>

Testifying before the House Appropriations Committee's Subcommittee on Tactical Air and Land Forces in April 2023, Lieutenant General Erik

Peterson, Army Deputy Chief of Staff for Programs, summarized the situation in starkly candid terms:

Several years of ruthless prioritization, eliminating, reducing and deferring lower priority and less necessary efforts, as well as divesting of legacy capabilities, has left little flexibility in our topline. We made the easy choices the first couple of years of this effort. We're now well into the realm of hard choices, really hard choices and downright excruciating choices.<sup>26</sup>

General McConville's more than \$1.9 billion Unfunded Priority List for FY 2024, containing dozens of critical items, is testament to what the Army was not able to include in its budget request: air defense systems, organic industrial base modernization, and helicopter replacement—among many other programs.<sup>27</sup>

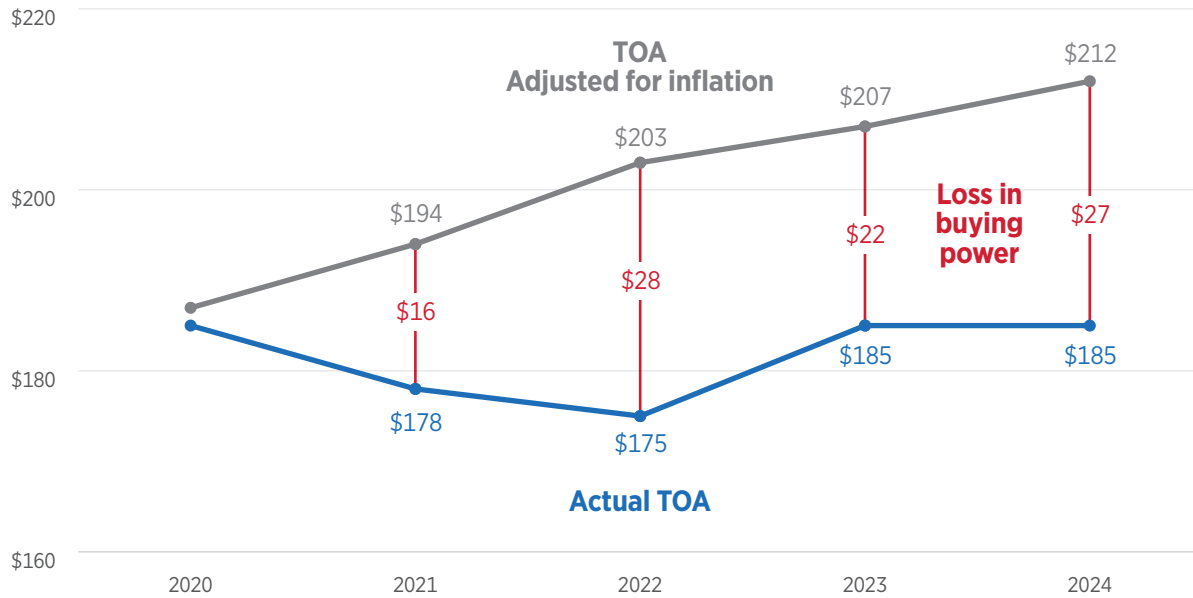
### Capacity

Capacity refers to the sufficiency of forces and equipment needed to execute the National Defense

## Army Budget Hit by Both Cuts and Inflation

Not only is the Army's total obligation authority (TOA) declining in real terms, but due to inflation, those declines have resulted in an additional loss of buying power since 2020. Combined losses from 2020 to 2024 total \$93 billion.

BILLIONS OF DOLLARS



**SOURCES:** Honorable Gabe Camarillo, Under Secretary of the Army, "Army Fiscal Year 2024 Budget Overview," PowerPoint Presentation, p. 14, <https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/pbr/Army%20FY%202024%20Budget%20Overview%20Briefing.pdf> (accessed September 14, 2023), and Table S-9, "Economic Assumptions," in Executive Office of the President, Office of Management and Budget, *Budget of the U.S. Government, Fiscal Year 2024*, p. 167, [https://www.whitehouse.gov/wp-content/uploads/2023/03/budget\\_fy2024.pdf](https://www.whitehouse.gov/wp-content/uploads/2023/03/budget_fy2024.pdf) (accessed September 14, 2023).

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Strategy. One of the ways the Army quantifies its warfighting capacity is by its number of Brigade Combat Teams (BCTs).

**Brigade Combat Teams.** BCTs are the Army's primary combined arms, close combat force. They often operate as part of a division or joint task force, both of which are the basic building blocks for employment of Army combat forces. BCTs are usually employed within a larger framework of U.S. land operations but are equipped and organized so that they can conduct limited independent operations as circumstances demand.<sup>28</sup>

BCTs range between 4,000 and 4,700 soldiers in size. There are three types: Infantry, Armored, and Stryker. At its core, each of these formations

has three maneuver battalions enabled by multiple other units such as artillery, engineers, reconnaissance, logistics, and signal units.<sup>29</sup>

The simplest way to understand the status of hard Army combat power is to know the readiness, quantity, and modernization level of BCTs. This section deals with the number of BCTs in the force.

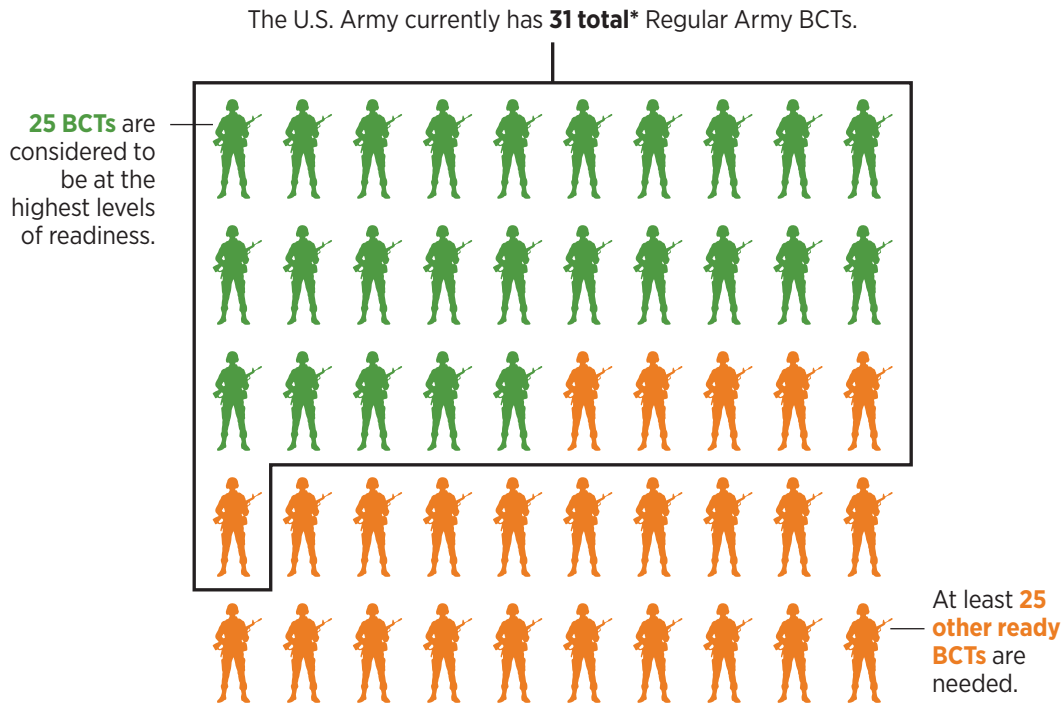
In 2013, the Army announced that because of end strength reductions and the priorities of the prior Administration, the number of Regular Army BCTs would be reduced from 45 to 33.<sup>30</sup> Subsequent reductions reduced the number of Regular Army BCTs from 33 to 31, where they remain today.<sup>31</sup>

When the Trump Administration and Congress reversed the planned drawdown in Army end

FIGURE 3

## Army Capacity: Brigade Combat Teams

Based on historical force requirements, The Heritage Foundation assesses that the Army needs a total of 50 Brigade Combat Teams (BCTs).



\* Includes four Army National Guard BCTs.

SOURCE: Email from Professional Staff, U.S. House of Representative, Committee on Appropriations, July 14, 2023.

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strength and authorized personnel growth beginning in 2018, instead of “re-growing” the numbers of BCTs, the Army chose to “thicken” the force and raise the manning levels within the individual BCTs to increase unit readiness. The Army’s goal was to fill operational units to 105 percent of their authorized manning,<sup>32</sup> but the decision announced in the FY 2023 budget to cut end strength by 33,000 soldiers (to 452,000) will reverse those trends and cause units to be undermanned instead of overmanned.

**Combat Aviation Brigades.** The Regular Army also has a separate air component that is organized into Combat Aviation Brigades (CABs). CABs are made up of Army rotorcraft, such as the AH-64 Apache, and perform various roles including attack, reconnaissance, and assault. The number of Army

aviation units also has been reduced. There are now 11 CABs in the Regular Army.<sup>33</sup>

**Generating Force.** CABs and Stryker, Infantry, and Armored BCTs make up the Army’s main combat fighting forces, but they obviously do not make up the entirety of the Army. Assuming that the Army shrank proportionately in all categories as it reduced to 452,000 in the Active component, there are approximately 194,000 soldiers in combat units, 123,000 in support units, and 134,000 in overhead units. Overhead is composed of administrative units and units that provide such types of support as preparing and training troops for deployments, carrying out key logistics tasks, staffing headquarters, and overseeing military schools and Army educational institutions.<sup>34</sup>

TABLE 8

## Major Army Combat Formations

| <b>Brigade Combat Teams</b>   | <b>Regular Army</b> | <b>Army National Guard</b> | <b>Total</b> |
|-------------------------------|---------------------|----------------------------|--------------|
| Infantry Brigade Combat Teams | 14                  | 20                         | 33           |
| Stryker Brigade Combat Teams  | 6                   | 2                          | 9            |
| Armored Brigade Combat Teams  | 11                  | 5                          | 16           |
| <b>Total</b>                  | <b>31</b>           | <b>27</b>                  | <b>58</b>    |

| <b>Aviation Brigades</b>               | <b>Regular Army</b> | <b>Army National Guard</b> | <b>Total</b> |
|--|---------------------|----------------------------|--------------|
| Combat Aviation Brigades               | 11                  | -                          | 11           |
| Expeditionary Combat Aviation Brigades | -                   | 8                          | 8            |
| Theater Aviation Brigades              | -                   | 2                          | 2            |
| <b>Total</b>                           | <b>11</b>           | <b>10</b>                  | <b>21</b>    |

### SOURCES:

- U.S. Department of the Army, *Department of the Army Fiscal Year (FY) 2024 Budget Estimates, Volume 1, Operation and Maintenance, Army, Justification of Estimates*, March 2023, pp. 62 and 128, <https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Operation%20and%20Maintenance/Regular%20Army%20Operation%20and%20Maintenance%20Volume%201.pdf> (accessed September 14, 2023).
- U.S. Department of the Army, *Department of the Army Fiscal Year (FY) 2024 Budget Estimates, Volume 1, Operation and Maintenance, Army National Guard, Justification Book*, March 2023, pp. 42 and 101, <https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Operation%20and%20Maintenance/National%20Guard%20Army%20Operation%20and%20Maintenance.pdf> (accessed September 14, 2023).

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**Functional or Multifunctional Support Brigades.** In addition to the institutional Army, a number of functional or multifunctional support brigades provide air defense; engineering; explosive ordnance disposal; chemical, biological, radiological, and nuclear protection; military police; military intelligence; and medical support among other types of battlefield support. Special operations forces such as the 75th Ranger Regiment, six Special Forces Groups, and the 160th Special Operations Aviation Regiment are also included in these numbers.

The Army is revising its force structure to accommodate a lower active end strength. When its end strength was reduced from 485,000 to 452,000 in FY 2023, the Army did not announce any changes in force structure. This has resulted in understrength units. Among other changes, the Army is reportedly considering a 10 percent cut in Special Forces structure.<sup>35</sup> Other changes are likely.

**New Concepts and Supporting Force Structure.** At the same time the Army is facing the need to cut units to meet its new end strength, it is also trying to adapt its force structure to meet the anticipated new demands of near-peer competition. The foundations for these changes are contained in the Army's Multi-Domain Operations (MDO) concept, published in December 2018, which describes how the Army views the future.<sup>36</sup>

In January 2022, the Army announced that it planned to modify its force structure for MDO under the designation "Army 2030." Other than that announcement, the Army has been silent on future force structure and its plans are seemingly in flux as it grapples with recruiting shortfalls. As part of its adaptation to MDO, the Army did reactivate V Corps Headquarters on October 16, 2020, to provide operational planning, mission command, and oversight of rotational forces in Europe.<sup>37</sup> On June 8,

2022, the Army reactivated the 11th Airborne Division in Alaska as an element of its “arctic strategy.”<sup>38</sup>

The Army also has announced plans to create five Multi-Domain Task Forces (MDTFs): “theater-level maneuver elements designed to synchronize precision effects and precision fires in all domains against adversary anti-access/ area denial (A2/AD) networks in all domains, enabling joint forces to execute their operational plan (OPLAN)-directed roles.”<sup>39</sup> One MDTF is currently stationed at Joint Base Lewis–McChord in Washington State. The second is stationed in Wiesbaden, Germany, aligned to Europe,<sup>40</sup> and the third was activated on September 23, 2022, in Hawaii.<sup>41</sup> These task forces contain rockets, missiles, military intelligence, and other capabilities that will allow Army forces to operate seamlessly with joint partners and conduct multi-domain operations. The Army has not announced plans for the remaining two of the five MDTFs that were originally envisioned.

To relieve the stress on the use of BCTs for advisory missions, the Army has activated six Security Force Assistance Brigades (SFABs), one in the National Guard and the other five in the Regular Army. These units, each one of which is composed of 816 soldiers, are designed specifically to train, advise, and mentor other partner-nation military units. The Army had been using BCTs for this mission, but because train-and-assist missions typically require senior officers and noncommissioned officers, a BCT comprised predominantly of junior soldiers was a poor fit. Other than the National Guard SFAB, the five active SFABs are regionally aligned to combatant commands.<sup>42</sup>

**Force Too Small to Execute the NDS.** Army leaders have consistently stated that the Army is too small to execute the National Defense Strategy at less than significant risk. For FY 2023, the Army had an authorized total end strength of 1,010,500 soldiers:

- 452,000 in the Regular Army,
- 177,000 in the Army Reserve, and
- 325,000 in the Army National Guard (ARNG).<sup>43</sup>

In March 2021, General McConville stated that “I would have a bigger...sized Army if I thought we could afford it, I think we need it, I really do....

I think the regular Army should be somewhere around 540–550 [thousand],” and “we’re sitting right now at 485,000.” (Of course, the Army is “sitting” now at 452,000.) He further observed that “I’ve probably already had to give up the growth that we’re going to have planned” and that “[w]e’re probably not going to grow the Army even though I’d like to, more, because end strength is something we have to take a look at.”<sup>44</sup>

The Army’s prior plans to increase the size of the Regular Army force were slammed into reverse because of recruiting challenges. The Army had planned to raise the Regular Army incrementally to above 500,000 by adding approximately 2,000 soldiers per year.<sup>45</sup> At that rate, it would have reached 500,000 by around 2028. Now that modest plan is off the table.<sup>46</sup>

Overall end strength dictates how many BCTs the Army can form, and by cutting end strength, the service not only will be unable to add more combat units or other in-demand units such as air and missile defense units, but also will have to reduce the manning levels in the units it possesses. This will drive a higher operational tempo (OPTEMPO) for Army units and increase risk both for the force and for the Army’s ability to carry out its mission.

Many outside experts agree that the U.S. Army is too small. In 2017, Congress established the National Defense Strategy Commission to provide an “independent, non-partisan review of the 2018 National Defense Strategy.” (Two of the commissioners, Dr. Kathleen Hicks and Mr. Michael McCord, are now top DOD leaders.) Among its findings, the commission unanimously reported that the NDS now charges the military with facing “five credible challengers, including two major-power competitors, and three distinctly different geographic and operational environments.” The commission assessed that “[t]his being the case, a two-war force sizing construct makes more strategic sense today than at any previous point in the post-Cold War era.” In other words, “[s]imply put, the United States needs a larger force than it has today if it is to meet the objectives of the strategy.”<sup>47</sup>

In addition to the increased strategic risk of not being able to execute the NDS within the desired time frame, the combination of an insufficient number of BCTs and a lower-than-required Army end strength has resulted in a higher-than-desired level of OPTEMPO. Assistant Deputy Chief of Staff,

G-3/5/7, Major General Sean Swindell recently stated that the Army had tried to reduce the demands on the force but that this “effort has been going in the opposite direction.”<sup>48</sup>

**Army Force Posture.** The Army also has transitioned from a force with a third of its strength typically stationed overseas, as it was during the Cold War, to a force that is based mostly in the continental United States. An average of 311,870 troops were stationed in Europe from 1986 to 1990, and the majority were Army soldiers. When the Berlin Wall fell, that number plunged to 109,452 from 1996–2000,<sup>49</sup> and the numbers have continued to drop. In 2023, only two BCTs are permanently stationed overseas: the 173rd Airborne BCT in Italy and the 2nd Cavalry Regiment in Germany. The desire to find a “peace dividend” following the dissolution of the Soviet Union, combined with a reluctance to close bases in the United States, led to large-scale base closures and force reductions overseas. Even though the 2022 NDS places a high premium on how the Joint Force is postured, most of the Army remains in the U.S., thousands of miles from where it will be needed.

Among Army units that deploy periodically are Armored and Stryker Brigade Combat Teams (ABCTs) and Patriot Battalions that rotate to and from Europe, Kuwait, and Korea. Rather than relying on forward-stationed BCTs, the Army currently rotates ABCTs to Europe and Kuwait and Stryker BCTs to Korea on a “heel-to-toe” basis so that there is never a gap.

The Russia–Ukraine war has brought the question of stationing more Army forces in Europe back to the forefront. Joint Chiefs of Staff Chairman General Mark Milley has suggested that the U.S. should establish more permanent European bases and rotate more forces to the continent.<sup>50</sup> There is disagreement as to which represents the better option: rotated forces or forward-stationed forces.

- Proponents of rotational BCTs argue that they arrive fully trained, that they remain at a high state of readiness throughout their typically nine-month overseas rotation, and that the cost of providing for accompanying military families is avoided.
- Those who favor forward-stationed forces point to a lower overall cost (when their

equipment remains in place), forces that typically are more familiar with the operating environment, and a more reassuring presence for our allies.<sup>51</sup>

In reality, both types of force postures are needed, not only for the reasons mentioned, but also because the mechanisms by which a unit is deployed, received into theater, and integrated with the force stationed abroad should be practiced on a regular basis.

### Capability

Capability in this context refers to the quality, performance, suitability, and age of the Army’s various types of combat equipment. In general, the Army is using equipment developed in the 1970s, fielded in the 1980s, and incrementally upgraded since then. This “modernization gap” was caused by several factors: the predominant focus on the wars in Iraq and Afghanistan since 9/11; pressures caused by budget cuts, especially those associated with the BCA; and failures in major modernization programs like the Future Combat System, Ground Combat Vehicle, and Crusader artillery system.

Army leaders today clearly view this situation as a serious challenge. General James Rainey, the head of Army Futures Command, has said that “[w]e need to approach 2040 with a sense of urgency now” because “[t]ransforming the Army to ensure war-winning future readiness...is the best guarantee that our successful materiel modernization efforts will produce lethal formations that will deter our enemies, and, if required, dominate the land domain in conflict.”<sup>52</sup>

General McConville has similarly urged that “[w]e must transform the Army” and that “the time is now...to transform our doctrine, our organizations, our training...our equipment, and...how we compete around the world in order to protect the freedoms and the global order we enjoy today.” He further suggests “that about every 40 years, the Army transforms to meet the National Security threats of that time. We did it in 1940’s for World War II; we did it in 1980’s for the Cold War; we are doing it now in 2020 for the Great Power Competition environment that we live in.”<sup>53</sup>

The Army has embarked on an ambitious program to modernize and hopes to put 24 new systems into the hands of soldiers in FY 2023. Among

these systems are hypersonic missiles, a precision strike missile, a directed energy air defense capability, and the Lower Tier Air and Missile Defense Sensor. These systems represent tangible progress.

Interested parties also should pay attention to additional areas other than the number of systems being fielded: the quantities of the systems being fielded and the times that will be required for the Army to reach their acquisition objectives for new equipment. Because of budget limitations, the initial quantities of systems being fielded are relatively modest: for example, 120 Precision Strike Missiles. Reaching the acquisition objective for other pieces of new equipment will take many years: for the Armored Multipurpose Vehicle, 25 years; the Joint Lightweight Tactical Vehicle, 23 years, and Mobile Protected Firepower, 14 years.<sup>54</sup>

**Loss of Competitive Advantage.** These new modernization programs cannot come quickly enough. As an example of how Army equipment is falling behind that of our competitors, the Army Tactical Missile System (ATACMS), first introduced in 1991, is the Army's only ground-launched precision missile with a range greater than 100 kilometers (km). Because of restrictions in the Intermediate Range Nuclear Forces Treaty and other factors, it was limited to a maximum range of 300 km.

China and Russia have much more substantial inventories of conventional, precision, ground-launched missiles and rockets. China has nine major ground-launched missile systems and more than 425 launchers. These capable systems can range from 600 km (DF-11A and DF-15) to 4,000 km (DF-26).<sup>55</sup> Russia, on the other hand, at least before the war in Ukraine, had the widest inventory of missiles in the world: at least four conventional ground-launched missile systems that can range from 120 km (SS-21) to 2,500 km (SSC-8).<sup>56</sup> The Army plans to start fielding the Precision Strike Missile in the fourth quarter of 2023, but the initial quantities will be modest (120).<sup>57</sup>

Another example of this loss in competitive advantage can be found in main battle tanks. When the M-1 Abrams was introduced in 1980, it was indisputably the world's best tank. Since then, Russia has developed—and before the Ukraine War was reportedly prepared to export—versions of its T-14 Armata tank, which has an unmanned turret, reinforced frontal armor, an information management system that controls all elements of the tank,

an active protection system, a circular Doppler radar, an option for a 155 mm gun, and 360-degree ultraviolet high-definition cameras.<sup>58</sup> Other defense assessments rate two other tanks—the German Leopard 2A7V and the South Korean K2 Black Panther—as superior to the M-1A2 SEP v3.<sup>59</sup>

The point is not to pick the best tank in the world. Rather, the point is that although the M-1A2 SEP v3 (the most recent version) is a very good tank, the decisive advantage the U.S. once enjoyed in tank design has disappeared.

Similarly, the U.S. Army's Patriot Missile System is an excellent system, but countries such as Saudi Arabia, Turkey, and India have either purchased or recently expressed interest in buying the Russian competitor system, the S-400.<sup>60</sup> Why? Part of the answer lies in cost. The Patriot system is tremendously expensive; a Patriot battery (one-fourth of a battalion) costs about \$3 billion for the launchers and a basic load of missiles, and an S-400 battery has been estimated to cost \$500 million.<sup>61</sup>

Within the Army's inventory of equipment are thousands of combat systems, including small arms, trucks, aircraft, soldier-carried weapons, radios, tracked vehicles, artillery systems, missiles, and drones. The following sections provide updates with respect to some of the major systems as they pertain to Armored, Stryker, and Infantry BCTs and Combat Aviation Brigades.

**Armored Brigade Combat Team (ABCT).** The Armored BCT's role is to “close with the enemy by means of fire and movement to destroy or capture enemy forces, or to repel enemy attacks by fire, close combat, and counterattack to control land areas, including populations and resources.”<sup>62</sup> The Abrams Main Battle Tank (most recent version in production: M1A2 SEPv3, first unit equipped in FY 2020<sup>63</sup>) and Bradley Fighting Vehicle (most recent version: M2A4, first unit equipped in April 2022<sup>64</sup>) are the primary Armored BCT combat platforms.

The M-1 tank and Bradley Fighting Vehicle first entered service in 1980 and 1981, respectively. There are 87 M-1 Abrams tanks and 152 Bradley Fighting Vehicle variants in an ABCT.<sup>65</sup> Despite upgrades, the M-1 tank and the Bradley are now at least 40 years old, and their replacements will not arrive until the platforms are at least 50 years old.

**Optionally Manned Fighting Vehicle (OMFV).** The Army's replacement program for the Bradley, the Optionally Manned Fighting Vehicle,



was on an aggressive timeline, but the Army cancelled the request for proposals (RFP) in January 2020 and rereleased an RFP for what it called a “concept design” in December 2020. Five teams were selected to come up with designs for the OMFV. The next milestone was in July 2022 when the government released a final RFP. An award for three contractors to produce detailed designs is expected in the second quarter of FY 2023,<sup>66</sup> and “[t]he Army then intends to select one vendor for Low-Rate Initial Production near the end of FY2027.”<sup>67</sup>

Procurement funding for the OMFV does not yet appear in the Army’s FY 2024–FY 2029 program. Flat or declining funding such as the Army is currently experiencing could affect those plans.

**A New Tank?** A potential clean-sheet replacement for the M-1 tank is even farther down the road. Major General Glenn Dean, Program Officer, Ground Combat Systems, reportedly has said that “funding to pursue what could be next for Abrams would likely not appear in a budget cycle until fiscal 2025 at the earliest.”<sup>68</sup> Meanwhile, the Army has another upgrade for the Abrams platform in the works: the M1A2 SEPv4, which would incorporate a “3rd Generation Forward Looking Infrared (3GEN FLIR)” in addition to “new color cameras to the gunner/commander primary sights” as well as “an improved laser range finder, integration of a laser warning receiver system, improved lethality via Fire Control System (FCS) digital communication with a new Advanced Multi-Purpose round, improved accuracy via integration of a meteorological sensor, and improved onboard diagnostics.”<sup>69</sup> Fielding will begin in FY 2024.

**Armored Multi-Purpose Vehicle (AMPV).** The venerable M113 multi-purpose personnel carrier is also part of an ABCT and fills multiple roles such as mortar carrier and ambulance. It entered service in 1960 and is being replaced by the new Armored Multi-Purpose Vehicle (AMPV), which after numerous delays entered low-rate initial production on January 25, 2019. The system’s first fieldings took place on March 13, 2023.<sup>70</sup> The Army’s FY 2024 budget includes a request for procurement of 91 AMPVs. At that rate of procurement and given prior year procurements, it will take the Army at least 25 years from 2024 to meet its objective of 2,897 AMPVs by FY 2049.<sup>71</sup>

**Stryker Brigade Combat Team (SBCT).** The Stryker BCT “is an expeditionary combined arms

force organized around mounted infantry” and is able to “operate effectively in most terrain and weather conditions” because of its rapid strategic deployment and mobility.<sup>72</sup> Stryker BCTs are equipped with approximately 321 eight-wheeled Stryker vehicles.<sup>73</sup> Relatively speaking, these vehicles are among the Army’s newest combat platforms, having entered service in 2001.

In response to an Operational Needs Statement, the Stryker BCT in Europe received Strykers fitted with a 30 mm cannon to provide an improved anti-armor capability.<sup>74</sup> Based on the success of that effort, the Army decided to outfit at least three of its SBCTs that are equipped with the Double V-hull, which affords better underbody protection against such threats as improvised explosive devices, with the 30 mm autocannon.<sup>75</sup> The next SBCT to receive the cannons (after the 2nd Cavalry Regiment) will be the 1-2 SBCT at Joint Base Lewis–McChord in Washington State; delivery was scheduled for July 2023.<sup>76</sup> The Army is also integrating Javelin anti-tank missiles on the Stryker platform and began to train crews on this capability in May 2022.<sup>77</sup>

**Infantry Brigade Combat Team (IBCT).** The Infantry BCT “is an expeditionary, combined arms formation optimized for dismounted operations in *complex terrain*,” which the Army defines as “a geographical area consisting of an urban center larger than a village and/or of two or more types of restrictive terrain or environmental conditions occupying the same space.”<sup>78</sup> Infantry BCTs have fewer vehicles and rely on lighter platforms such as trucks; High Mobility Multipurpose Wheeled Vehicles (HMMWVs); and Joint Light Tactical Vehicles (JLTVs) for mobility.

**Joint Light Tactical Vehicle (JLTV).** The JLTV aspires to combine the protection offered by Mine Resistant Ambush Protected Vehicles (MRAPs) with the mobility of the original unarmored HMMWV. The vehicle features design improvements that increase its survivability against anti-armor weapons and improvised explosive devices (IEDs). The Army Procurement Objective is 49,099 trucks,<sup>79</sup> replacing about 50 percent of the current HMMWV fleet.

Requested FY 2024 funding of \$839.4 million would support procurement of 1,753 JLTVs and 848 trailers. This reflects an increase in funding (\$664.1 million was enacted for FY 2023), suggesting that the Army is recommitted to this program.

TABLE 9

## Procurement of Select Army Systems Will Take Decades to Complete

| System                                    | Army Acquisition Objective | Funded Through FY 2024 | Years Needed to Complete Army Fielding at FY 2024 Procurement Rate |
|---|----------------------------|------------------------|--|
| Armored Multi-Purpose Vehicle (AMPV)      | 2,897                      | 519                    | 25   |
| Joint Assault Bridge (JAB)                | 297                        | 126                    | 28   |
| Mobile Protected Firepower (MPF)          | 504                        | 33                     | 15   |
| Joint Lightweight Tactical Vehicle (JLTV) | 49,099                     | 6,365                  | 24   |
| Ground Mobility Vehicle                   | 2,593                      | 739                    | 14   |

**SOURCES:** U.S. Department of the Army, *Department of Defense Fiscal Year (FY) 2024 Budget Estimates, Army, Justification Book Volume 1 of 1, Procurement of W&TCV, Army*, March 2023, pp. 1 and 12, <https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Procurement/Procurement%20of%20Weapons%20and%20Tracked%20Combat%20Vehicles.pdf> (accessed September 14, 2023), and U.S. Department of the Army, *Department of Defense Fiscal Year (FY) 2024 Budget Estimates, Army, Justification Book Volume 1 of 3, Other Procurement, Army, Tactical and Support Vehicles, Budget Activity 1*, March 2023, p. 39 and 49, <https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Procurement/Other%20Procurement%20-%20BA%201%20-%20Tactical%20&%20Support%20Vehicles.pdf> (accessed September 14, 2023).

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Considering the 4,612 JLTVs the Army has already procured<sup>80</sup> and procurement at a rate of 1,753 vehicles (the FY 2024 quantity), the Army will not reach its procurement objective of 49,099 for the JLTV until 2048, leaving it to rely on aging HMMWVs that began fielding in 1983.<sup>81</sup>

**Mobile Protected Firepower (MPF).** The Army has developed a light tank, previously called Mobile Protected Firepower and now officially named the M10 Booker, to provide IBCTs with the firepower to engage enemy armored vehicles and fortifications.<sup>82</sup> In June 2022, the Army awarded General Dynamics Land Systems a contract for 96 MPF systems. The first units are expected to receive the M10 in the fourth quarter of FY 2025. The Army's acquisition objective is for 504 M10s, organized in battalions of 42 systems. The \$394.6 million requested in the FY 2024 budget will acquire 33 systems.<sup>83</sup> At that rate of procurement, the Army will meet its objective in FY 2038.

**Ground Mobility Vehicle (GMV).** Airborne BCTs are the first IBCTs to receive a new platform to increase their speed and mobility. The GMV (also referred to as the Infantry Squad Vehicle) provides

enhanced tactical mobility for an IBCT nine-soldier infantry squad with their associated equipment. GM Defense was selected for the production contract in June 2020. The Army has approved a procurement objective of 11 IBCT sets at 59 vehicles per IBCT for a total of 649 vehicles. The approved Army acquisition objective is 2,593. Given prior procured quantities of 596 and at the procurement rate of 143 per year, the Army will reach its acquisition objective in FY 2037.<sup>84</sup>

**Combat Aviation Brigade.** CABs are composed of AH-64 Apache attack, UH-60 Black Hawk medium-lift, and CH-47 Chinook heavy-lift helicopters. The Army has been methodically upgrading these fleets for decades, but the FY 2024 budget request continues the reduction in legacy aircraft procurement that began in FY 2022, presumably to create “budget room” for the planned introduction of two new aircraft: the Future Long-Range Assault Aircraft (FLRAA) and Future Attack Reconnaissance Aircraft (FARA). This is a continued reflection of downward budget pressure and incurs additional risk for the Army as its legacy helicopters are expected to be around for decades.

**UH/HH-60.** The acquisition objective for the H-60 medium-lift helicopter is 1,375 H-60Ms and 760 recapitalized 60-A/L/Vs for a total of 2,135 aircraft. The FY 2024 procurement request for the UH-60M is \$760.7 million, which would support the procurement of 24 aircraft, 11 less than the 35 that were funded in FY 2023. The FY 2024 budget request reflects planned UH-60 procurement in FY 2026.<sup>85</sup>

**CH-47.** The CH-47F Chinook, a rebuilt variant of the Army's CH-47D heavy-lift helicopter, has an acquisition objective of 535 aircraft and, with no planned replacement on the horizon, is expected to remain the Army's heavy-lift helicopter for the foreseeable future. The FY 2024 budget request of \$221.4 million would support the service life extension of six aircraft, as well as retrofits, all of which would be for the MH-47G special operations model.<sup>86</sup>

**AH-64.** The AH-64E heavy attack helicopter has an Army acquisition objective of 812 aircraft (a combination of remanufactured and new build), which is being met by the building of new aircraft and remanufacturing of older AH-64 models. The \$828.9 million FY 2024 procurement request would support the purchase of 42 AH-64E aircraft, nine more than the 33 funded in FY 2023 budget.<sup>87</sup>

Overall, the Army's equipment inventory, while increasingly dated, is maintained well. Under its current modernization plans, "the Army envisions [the M-1 Abrams Tank, M-2/M-3 Bradley Fighting Vehicle (BFV), and M-1126 Stryker Combat Vehicle] to be in service with Active and National Guard forces beyond FY2028."<sup>88</sup>

**Future Programs and Efforts.** In addition to seeing to the viability of today's equipment, the military must look to the health of future equipment programs. Although future modernization programs do not represent current hard-power capabilities that can be applied against an enemy force today, they are a leading indicator of a service's overall fitness for future sustained combat operations. In future years, the service could be forced to engage an enemy with aging equipment and no program in place to maintain viability or endurance in sustained operations.

The U.S. military services are continually assessing how best to stay a step ahead of competitors: whether to modernize the force today with currently available technology or wait to see what

investments in research and development produce years down the road. Technologies mature and proliferate, becoming more accessible to a wider array of actors over time.

After 20 years of a singular focus on counter-insurgency followed by concentration on the current readiness of the force, the Army is now playing catch-up in equipment modernization.

**New Organizations and Emphasis on Modernization.** In 2017, the Army established eight cross-functional teams (CFTs) to improve the management of its top modernization priorities, and in 2018, it established a new four-star headquarters, Army Futures Command, to lead modernization efforts.<sup>89</sup> In 2023 the Army announced the creation of a new Cross Functional Team to handle logistics.<sup>90</sup>

Even though it has been six years, it is still too early to assess whether these new structures, commands, and emphasis will result in long-term improvement in the Army's modernization posture. The Army aspires to develop and procure an entire new generation of equipment based on its six modernization priorities: "long range precision fires, next generation combat vehicles, future vertical lift, network, air and missile defense, and Soldier lethality."<sup>91</sup>

Although the Army has put in place new organizations, plans, and strategies to manage modernization, the future is uncertain, and Army programs remain in a fragile state with only a few in an active procurement status. The Army has shown great willingness to make tough choices and reallocate funding toward its modernization programs, but this has usually been at the expense of end strength or reduction in the total quantity of new items purchased.

As budget challenges such as nuclear deterrence programs, inflation, rising personnel costs, health care, and the need to invest in programs to respond to China's increasingly aggressive activities continue to present themselves, the Army desperately needs time and funding to modernize its inventory of equipment. Recent modernization programs seem to be on track except for the Extended Range Cannon program,<sup>92</sup> the Improved Turbine Engine Program,<sup>93</sup> and the Integrated Visual Augmentation System,<sup>94</sup> all of which have suffered some setbacks. The Army also is experiencing some success, one example being the number of Stryker vehicle-mounted Maneuver Short Range Air Defense

(M-SHORAD) systems that have been delivered to Europe.<sup>95</sup> Army officials are currently optimistic about future fielding dates for equipment like the hypersonic weapon firing battery and the Precision Strike Missile, both of which are scheduled to begin delivery in FY 2023, but their success will depend on sustained funding.

## Readiness

**BCT Readiness.** Over the past four years, the Army has made steady progress in increasing the readiness of its forces. Its goal is to have 66 percent of the Regular Army and 33 percent of National Guard BCTs “at the highest levels of readiness.”<sup>96</sup>

As of July 14, 2023, the Army reported that “83 percent of Active Component Brigade Combat Teams are at the highest levels of tactical readiness.”<sup>97</sup> This is 17 percentage points above its goal and two percentage points above last year’s reported level. This means that 25 of the Army’s 31 active BCTs were at either C1 or C2, the two highest levels of tactical readiness, and ready to perform all or most of their wartime missions immediately. The *2023 Index* reported that 25 Regular Army BCTs were at the highest levels of readiness.

There also are 27 BCTs in the Army National Guard: five Armor, 20 Infantry, and two Stryker. The Army has allocated two Combat Training Center (CTC) rotations for two National Guard BCTs. These two BCTs “are resourced to achieve company-level proficiency, while the remaining 25 BCTs and enabler units are on a path to platoon minus-level proficiency and will meet Directed Readiness Table requirements.”<sup>98</sup> These training levels usually reveal the extent to which additional training time would be required before the unit could be deployed. Given the paucity of data provided by the Army, it is hard to assess the current readiness of ARNG units.

**Steady Decline in Training Resources.** When measuring resourcing for the training of Brigade Combat Teams, the Army formerly used full-spectrum training miles (FSTMs), representing the number of miles that formations are resourced to drive their primary vehicles on an annual basis. In FY 2024, the Army changed the terminology to Composite Training Miles but explained that they are the same thing. Since FY 2019, these training resources have been declining. In FY 2021, the Army budgeted 1,598 FSTMs to train BCTs to 100 percent of the requirement.<sup>99</sup> According to the Army’s FY 2024

budget justification exhibits, only 1,137 Composite Training Miles are funded for non-deployed units. This is a cut of 28 percent, suggesting that unless the Army’s training strategy radically changed, *BCTs are funded only to 72 percent of the training requirement.*

For Combat Aviation Brigades, the Army uses hours per crew per month (H/C/M), which reflects the number of hours that aviation crews can fly their helicopters per month. The 9.2 flying hours budgeted in the FY 2024 request are 13 percent lower than the 10.6 active flying hours per crew per month enacted in the FY 2023 budget.<sup>100</sup>

**Uncertain Training Level Goals.** Starting with the FY 2022 budget justification books, the Army began to omit the Unit Proficiency Level Goal, which for years has been to train a BCT to operate as a BCT; it is likely now training to act as a battalion or company. This implies that brigade combat teams will not be effective in executing brigade-level or brigade-size tasks if called into action. Having competent companies or battalions is one thing; being able to orchestrate their actions to achieve higher-order tactical and operational tasks is much different.

**CTC Rotations.** The Army uses Combat Training Centers to train its forces to desired levels of proficiency. Specifically, this important program “provide[s] realistic joint and combined arms training...approximating actual combat” and increases “unit readiness for deployment and warfighting.”<sup>101</sup> For FY 2024, the Army is resourcing 22 CTC rotations: eight at the National Training Center, eight at the Joint Readiness Training Center, four at the Joint Multinational Readiness Center, and two exportable rotations. Two of these 22 rotations are for Army National Guard Brigades.<sup>102</sup>

**New Readiness Model.** The Army has transitioned from one readiness model to another. Its Sustainable Readiness Model, implementation of which began in 2017, was intended to give units more predictability. Its new Regionally Aligned Readiness and Modernization Model (ReARMM) is designed to “better balance operational tempo (OPTEMPO) with dedicated periods for conducting missions, training, and modernization.”<sup>103</sup> ReARMM features units that spend eight months in a modernization-training-mission cycle while preparing to deploy to a specific part of the world. The Army shifted to this new model on October 1, 2021.<sup>104</sup> Since announcing the model in 2021, the Army has been silent on the topic.

In general, the Army continues to be challenged by structural readiness problems as evidenced by too small a force attempting to satisfy too many global presence requirements and Operations Plan (OPLAN) warfighting requirements. If demand is

not reduced, the funding cuts and end strength reduction featured in the FY 2023 budget submission and continued in the FY 2024 submission can be expected to result in a continued decline in readiness.

## Scoring the U.S. Army

### Capacity Score: Weak

Historical evidence shows that, on average, the Army needs 21 Brigade Combat Teams to fight one major regional conflict (MRC). Based on a conversion of roughly 3.5 BCTs per division, the Army deployed 21 BCTs in Korea, 25 in Vietnam, 14 in the Persian Gulf War, and approximately four in Operation Iraqi Freedom—an average of 16 BCTs (or 21 if the much smaller Operation Iraqi Freedom initial invasion operation is excluded).

In the 2010 Quadrennial Defense Review, the Obama Administration recommended a force capable of deploying 45 Active BCTs. Previous government force-sizing documents discuss Army force structure in terms of divisions and consistently advocate for 10–11 divisions, which equates to roughly 37 Active BCTs.

Considering the varying recommendations of 35–45 BCTs and the actual experience of nearly 21 BCTs deployed per major engagement, our assessment is that 42 BCTs would be needed to fight two MRCs.<sup>105</sup> Taking into account the need for a strategic reserve, the Army force should also include an additional 20 percent of the 42 BCTs, resulting in an overall requirement of 50 BCTs.

Previous editions of the *Index of U.S. Military Strength* counted a small number of Army National Guard BCTs in the overall count of available BCTs. Because the Army no longer makes mention of Army National Guard BCTs at the highest state of readiness, they are no longer counted in this edition of the *Index*. The Army has 31 Regular Army BCTs compared to a two-MRC construct requirement of 50. The Army's overall capacity score therefore remains unchanged from 2022.

- **Two-MRC Benchmark:** 50 Brigade Combat Teams.
- **Actual FY 2022 Level:** 31 Regular Army Brigade Combat Teams.

The Army's current BCT capacity equals 62 percent of the two-MRC benchmark and is therefore scored as "weak."

### Capability Score: Marginal

The Army's aggregate capability score remains "marginal." This aggregate score is a result of "marginal" scores for "Age of Equipment," "Size of Modernization Programs," and "Health of Modernization Programs." More detail on these programs can be found in the equipment appendix following this section. The Army is scored "weak" for "Capability of Equipment."

Despite modest progress with the JLTV, M10 Booker, Ground Mobility Vehicle, and AMPV programs, and in spite of such promising developments as creation of Army Futures Command, CFTs, and the initiation of new Research, Development, Testing and Evaluation (RDTE) funded programs, nearly all new Army equipment programs remain in the development phase and in most cases are at least a year from being fielded. FY 2024 requested funding levels for procurement and research and development are down 8 percent compared to the FY 2023 enacted levels, which further slows the pace of Army equipping and reduces the speed of procurement to below industry's minimum sustainment rates in some cases. The result of the FY 2024 budget request would be an Army that is aging faster than it is modernizing.

### Readiness Score: Very Strong

The Army reports that 83 percent of its 31 Regular Army BCTs are at the highest state of readiness.<sup>106</sup> The Army's internal requirement is for "66 percent...of the active component BCTs [to be] at the highest readiness levels."<sup>107</sup> Using the assessment methods of this *Index*, this results in a percentage of service requirement of 100 percent, or "very strong."

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

The Army’s overall score is calculated based on an unweighted average of its capacity, capability, and readiness scores. The unweighted average is 3.33; thus, the overall Army score is “marginal.”

This was derived from the aggregate score for capacity (“weak”); capability (“marginal”); and readiness (“very strong”). This score is the same as the assessment of the *2023 Index*, which rated the Army as “marginal” overall.

### U.S. Military Power: Army

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

# ARMY SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Main Battle Tank

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>M1A1/2 Abrams</b></p> <p>Inventory: <b>540/1,605</b><br/>Fleet age: <b>21/14</b> Date: <b>1980/1993</b></p> <p>The Abrams is the Army's primary ground combat system and main battle tank in its Armored Brigade Combat Teams (ABCTs). It is a tracked, low-profile, land combat assault weapon that provides mobility, lethal firepower, and protection. The Abrams has gone through several remanufacture programs to extend its life expectancy to 2045.</p> | 3         | 4                | <p><b>Decisive Lethality Platform (DLP)</b></p> <p>The DLP program, in its earliest stages of conceptualization, is a notional manned or unmanned vehicle that could replace some or all of the Abrams tanks. This program is part of the Next Generation Combat Vehicle (NGCV) program, which is number two among the Army's "Big Six" modernization priorities. The earliest a replacement for the Abrams tank could conceivably be introduced is sometime in 2033.</p> |            |              |

## Infantry Fighting Vehicle

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>M2 Bradley</b></p> <p>Inventory: <b>3,721</b><br/>Fleet age: <b>23</b> Date: <b>1981</b></p> <p>The Bradley is a fully tracked, lightly armored vehicle meant to transport infantry by providing protection from artillery and employing mounted firepower. The Bradley complements the Abrams tank in Armored Brigade Combat Teams (ABCTs). The Bradley has undergone remanufacture programs to extend its life expectancy to 2045.</p> | 2         | 3                | <p><b>Optionally Manned Fighting Vehicle (OMFV)</b></p> <p>The XM30 Mechanized Infantry Combat Vehicle is intended to replace the M2-Bradley Infantry Fighting Vehicle (IFV) and in its objective state will have the ability to conduct remotely controlled operations. The vehicle will include a hybrid-electric engine; a remotely operated cannon (in the objective state 50 mm); machine guns; anti-tank guided missiles; an advanced third-generation forward-looking infrared sensor; "intelligent fire control"; integrated active protection systems; kitted armor; and advanced signature management capabilities. In 2021, the Army awarded five firm fixed-price contracts as part of the XM30 Concept Design Phase where competing firms were asked to develop digital designs. In June 2023, the U.S. Army chose General Dynamics Land Systems and American Rheinmetall to move forward to the detailed design phase. Both companies will produce 11 prototypes for testing in the first quarter of 2025. The Army will choose a winning design in 2027 and begin fielding in 2029. This program is part of the Next Generation Combat Vehicle (NGCV) program, which is number two among the Army's "Big Six" modernization priorities. The Army plans for the first unit to be equipped by FY 2029.</p> |            |              |

**NOTE:** See page 429 for details on fleet ages, dates, and procurement spending.

# ARMY SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Armored Fighting Vehicle

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>Stryker</b></p> <p>Inventory: <b>4,223</b><br/>Fleet age: <b>16.5</b> Date: <b>2001</b></p> <p>The Stryker is a wheeled vehicle that is the main platform in Stryker BCTs. The program was considered an interim vehicle to serve until the arrival of the Future Combat System (FCS), but that program was cancelled because of technology and cost hurdles. The original Stryker is being replaced with Double-V-Hull variants. The Double V Hull provides increased under-vehicle blast protection. The Stryker is expected to remain in service for 30-plus years.</p> | 4         | 4                | None                |            |              |

## Armored Personnel Carrier

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|--|-----------|------------------|--|------------|--------------|
| <p><b>M113 Armored Personnel Carrier</b></p> <p>Inventory: <b>4,800</b><br/>Fleet age: <b>40</b> Date: <b>1960</b></p> <p>The fully tracked M113 personnel carrier serves in a supporting role for Armored Brigade Combat Teams (ABCTs) and in units above brigade level. As the first mass-produced aluminum combat vehicle, the M113 was made to protect against small-arms fire while being light enough to be transportable. The Army planned to replace the M113 with the Armored Multi-Purpose Vehicle, but due to reduced production rates and higher commodity prices, the cost per vehicle has increased, and the replacement program will take an extended period of time. Plans are to use the current platform until 2045.</p> | 1         | 1                | <p><b>Armored Multi-Purpose Vehicle (AMPV)</b></p> <p>Timeline: <b>2018-TBD</b></p> <p>The AMPV has been adapted from the Bradley Fighting Vehicle, which largely allowed the program to bypass an extensive technology development phase. The fleet will consist of five variants. Although total AMPV production remains behind schedule due to early manufacturing troubles, AMPV production rates reportedly are planned to increase to 131 vehicles per year by FY 2024 and to continue at that rate until at least 2027.</p> | 2          | 3            |

**PROCUREMENT**      **SPENDING (\$ millions)**

|  |  |
|--|--|
|  |  |
|--|--|

## Light Wheeled Vehicle

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>HMMWV</b></p> <p>Inventory: <b>106,767</b><br/>Fleet age: <b>20.5</b> Date: <b>1985</b></p> <p>The High Mobility Multipurpose Wheeled Vehicle (HMMWV) is a lightweight, highly mobile, high-performance wheeled vehicle used for a variety of purposes in combat or combat support services units. Its expected life span is 15 years. A portion of the HMMWV fleet is being slowly replaced by the Joint Light Tactical Vehicle (JLTV).</p> | 1         | 1                | <p><b>Joint Light Tactical Vehicle (JLTV)</b></p> <p>Timeline: <b>2015-2036</b></p> <p>The JLTV vehicle program is an Army-led, joint-service program that is replacing a portion of the Army's HMMWVs with armored tactical wheeled vehicles. The JLTV provides improved protection, reliability, maneuverability, and survivability of vehicles. In June 2019, the Army approved the JLTV for full-rate production. Production is underway, although current budget shortfalls have forced the Army to reduce procurement quantities.</p> | 3          | 4            |

**PROCUREMENT**      **SPENDING (\$ millions)**

|  |  |
|--|--|
|  |  |
|--|--|

**NOTE:** See page 429 for details on fleet ages, dates, timelines, and procurement spending.



# ARMY SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Attack Helicopter

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>AH-64 D Apache</b></p> <p>Inventory: <b>250</b><br/>Fleet age: <b>18.5</b> Date: <b>1997</b></p> <p>The Apache attack helicopter is designed to support Brigade Combat Teams (BCTs) as well as independent operations in the full spectrum of modern warfare including destroying armor, personnel, and material targets. The Apache has a modular open systems architecture that allows it to incorporate the latest communications, navigation, sensor, and weapon systems. Its expected life cycle is about 20 years.</p> | 2         | 3                | <p><b>AH-64E Reman</b></p> <p>Timeline: <b>2010–2025</b></p> <p>The AH-64E Reman (short for remanufactured) is a program to remanufacture older Apache helicopters into the more advanced AH-64E version, which is fully digital and meets the Army's joint interoperability goals for the future. The AH-64E has a new airframe and can carry modern munitions, including the JAGM missile, giving it significant combat capability as the Army's only heavy attack helicopter.</p> <p><b>PROCUREMENT*</b>      <b>SPENDING* (\$ millions)</b></p> <p>545      73      \$9,040      \$1,298</p>                              | 3          | 5            |
| <p><b>AH-64E</b></p> <p>Inventory: <b>490</b><br/>Fleet age: <b>5.5</b> Date: <b>2012</b></p> <p>The AH-64E variant is a remanufactured or newly built version of the AH-64D Apache attack helicopter with substantial upgrades in powerplant, avionics, communications, and weapons capabilities that make it the Army's most advanced attack helicopter. Its expected life cycle is about 20 years. The Army began procurement of the remanufactured version in 2010 and will conclude procurement in 2025.</p>                  | 5         | 5                | <p><b>AH-64E New Build</b></p> <p>Timeline: <b>2010–2027</b></p> <p>The AH-64E New Build program produces new build rather than rebuilt Apaches. The program is meant to modernize and sustain the current Apache inventory. The AH-64E has more modern and interoperable systems and is able to carry modern munitions, including the JAGM missile. Budget cuts in the 2022 request will likely close the AH-64E New Build line because the need for all-new components makes the cost of procurement significantly higher.</p> <p><b>PROCUREMENT*</b>      <b>SPENDING* (\$ millions)</b></p> <p>81      0      \$2,139</p> | 3          | 5            |

\* Additional procurement expected.

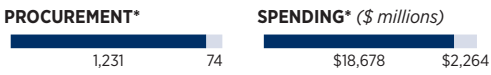
**NOTE:** See page 429 for details on fleet ages, dates, timelines, and procurement spending.

# ARMY SCORES

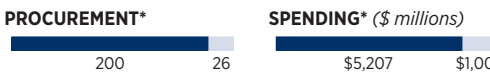
1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Medium Lift

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|---|-----------|------------------|--|------------|--------------|
| <p><b>UH-60A Black Hawk</b></p> <p>Inventory: <b>20</b><br/>Fleet age: <b>40.5</b> Date: <b>1978</b></p> <p>The UH-60A is the Army's primary medium-lift utility transport helicopter that provides air assault and aeromedical evacuation and supports special operations. Its expected life span is about 25 years. This variant of the Black Hawk is being replaced by the newer UH-60M variant.</p>   | 1         | 1                | <p><b>UH-60M Black Hawk</b></p> <p>Timeline: <b>2004-TBD</b></p> <p>The UH-60M, which began full production in 2007, serves to modernize and replace current Black Hawk inventories. The newer M-variant is a digital networked platform that will improve the Black Hawk's range and lift by upgrading its rotor blades, engine, and computers.</p> | 3          | 5            |
| <p><b>UH-60M Black Hawk</b></p> <p>Inventory: <b>931</b><br/>Fleet age: <b>9</b> Date: <b>2005</b></p> <p>The UH-60M is the modernized version of the original UH-60A Black Hawk helicopter. It has multiple upgrades including multi-mission capabilities, a new airframe, advanced digital avionics, and a powerful propulsion system. As the UH-60A is retired, the M-variant will be the main medium-lift rotorcraft used by the Army until it is replaced by the FLRAA. The UH-60M is expected to remain in service at least until 2040.</p> | 5         | 5                | <p><b>PROCUREMENT*</b> <b>SPENDING* (\$ millions)</b></p>    |            |              |

## Heavy Lift

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>CH-47F Chinook</b></p> <p>Inventory: <b>450</b><br/>Fleet age: <b>10.5</b> Date: <b>2002</b></p> <p>The F-variant of the CH-47 Chinook heavy-lift helicopter includes a new digital cockpit and monolithic airframe to reduce vibrations. It transports forces and equipment while providing such other functions as parachute drops and aircraft recovery. Its expected life span is 35 years. The Army plans to use the CH-47F at least until the late 2040s.</p> | 5         | 5                | <p><b>CH-47F</b></p> <p>Timeline: <b>2001-TBD</b></p> <p>Currently in production, the CH-47F program is intended to keep the fleet of heavy-lift rotorcraft viable for use in modern combat as older variants of the CH-47, notably the CH-47D, are retired. The program includes both remanufactured and new builds of CH-47s. The F-variant has engine and airframe upgrades to lower its maintenance requirements. Total procurement numbers include the MH-47G configuration, which is used by U.S. Special Operations Command.</p> | 3          | 5            |
|   |           |                  | <p><b>PROCUREMENT*</b> <b>SPENDING* (\$ millions)</b></p>   |            |              |

\* Additional procurement expected.

**NOTE:** See page 429 for details on fleet ages, dates, timelines, and procurement spending.

# ARMY SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Intelligence, Surveillance, and Reconnaissance (ISR)

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score   | Health Score |
|--|-----------|------------------|--|--|--------------|
| <p><b>MQ-1C Gray Eagle</b></p> <p>Inventory: <b>180</b><br/>Fleet age: <b>0.5</b> Date: <b>2011</b></p> <p>The Gray Eagle is a medium-altitude long-endurance (MALE) unmanned aerial vehicle (UAV) used to conduct intelligence, surveillance, and reconnaissance (ISR) missions. It offers better range, altitude, and payload flexibility than earlier systems. The Army has no plans to add to the 12 Gray Eagles that it procured in 2023.</p> | 4         | 4                | <p><b>MQ-1C Gray Eagle</b></p> <p>Timeline: <b>2010–2023</b></p> <p>The MQ-1C UAV is an unmanned aircraft system that provides the Army with reconnaissance, surveillance, and target acquisition capabilities. The Army did not plan to procure new MQ-1Cs for FY 2023.</p> | 5  | 5            |
|  |           |                  | <p><b>PROCUREMENT</b></p> <p style="text-align: center;">298</p>   | <p><b>SPENDING (\$ millions)</b></p> <p style="text-align: center;">\$565     \$40</p> |              |

\* Additional procurement expected.

**NOTES:** See Methodology for descriptions of scores. Fleet age is the average between the first and last years of delivery. The date is the year of first delivery. The timeline is from the first year of procurement to the last year of delivery/procurement. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E).

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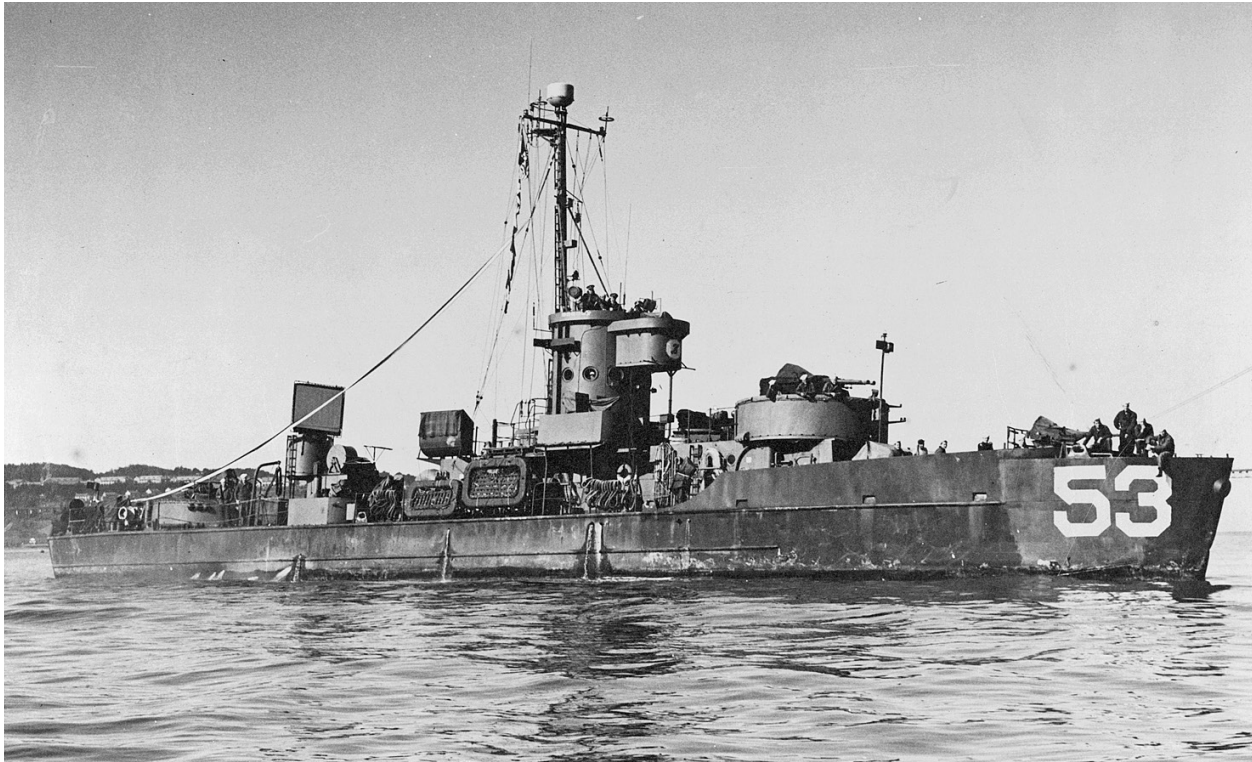


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USS LCS(L)(3)-53 under way in San Francisco Bay while returning home in 1946. ENS J. W. Middendorf USNR is the tall man on the bridge. Photo: from Middendorf's personal files.

## U.S. Navy Section: Dedication Ambassador J. William Middendorf II

Throughout his life, Ambassador J. William Middendorf has fought to advance the principles of American freedom both here and abroad. Over the course of his long and distinguished career, he has served as a navigator aboard the USS LCS(L)(3)-53 during World War II, an investment banker, and treasurer of the Republican National Committee and was appointed to ambassadorships in the Netherlands, the Organization of American States, and the European Union. As 62nd Secretary of the Navy, he secured a 60 percent increase in the Navy's budget at a time when those of the Army and Air Force remained flat.

Ambassador Middendorf is a prolific author. His most recent book is *The Great Nightfall: How We Win the New Cold War* (Heritage Harbor Press, 2020), which one critic has described as “a remarkable read” and a “clarion call to action.” He was also a driving force behind The Heritage Foundation

for many years and served as a Trustee from 1989 to 2022.

In a fitting tribute to this lifetime of service, Heritage Foundation supporters Philip and Patricia Bilden offered a generous gift to Heritage to dedicate the Navy section of the *Index of U.S. Military Strength* to Ambassador Middendorf for the next five years. This is the first time any section of this *Index* has been so dedicated. As chairman of the Naval War College Foundation, Mr. Bilden had the honor of presenting the foundation's highest award—Sentinel of the Sea—to Ambassador Middendorf in 2021 in tribute to his many years of distinguished service to the nation.

We are grateful for the opportunity to honor the many contributions Ambassador Middendorf has made on behalf of individual freedom, traditional American values, and a strong national defense anchored in maritime dominance.



# U.S. Navy

Brent D. Sadler

Navies exist to assure access to markets and influence events on land for political ends and to prevail in maritime combat when war occurs. To these ends, the U.S. Navy, Marine Corps, and Coast Guard (known collectively as the sea services) have enabled America to project power across the oceans, controlling activities on the seas whenever and wherever needed.

According to the Department of the Navy’s annual budget briefing for fiscal year (FY) 2024, the service’s three “enduring priorities” as articulated by the Secretary of the Navy are:

- “Strengthening Maritime Dominance in Order to Defend the Nation,”
- “Taking Care of People through Building a Culture of Warfighting Excellence,” and
- “Succeeding through Teamwork by Enhancing Strategic Partnerships.”<sup>1</sup>

President Joseph Biden’s proposed \$202.5 billion Navy budget for FY 2024 represents a \$9.7 billion increase over the FY 2023 enacted budget—an increase of 5 percent.<sup>2</sup> While this increase is needed, it is not enough to deliver on the Secretary’s goals given persistent inflationary pressures and the rapidly modernizing and expanding Chinese threat.

The Navy remains under immense strain to maintain readiness for combat while also conducting the daily peacetime operations that are necessary to compete with the activities of China and Russia. In the year since publication of the *2023 Index of U.S. Military Strength*, there have been several significant developments that are important to the Navy. For example:

- In January 2023, the Navy shut down its dry docks at the west coast Puget Sound public shipyard and Bremerton naval base to assess vulnerability to earthquake damage.<sup>3</sup> This affected the submarine *Connecticut*, which was awaiting repairs following a collision with an uncharted seamount on October 2, 2021, in the South China Sea, sustaining significant damage.<sup>4</sup>
- On January 10, 2023, the Navy discontinued tracking and reporting on COVID deaths and vaccinations. The final numbers as of February 10, 2023, are 17 uniformed member deaths due to COVID and 1,878 sailors separated for refusing the vaccine.<sup>5</sup>
- On March 13, 2023, after an 18-month review, President Biden was joined in San Diego by prime ministers from the United Kingdom (U.K.) and Australia to announce the way ahead for the Australia–U.K.–U.S. (AUKUS) partnership to develop an Australian nuclear submarine program.<sup>6</sup> This plan includes a rotational presence of U.S. nuclear submarines to be based out of Australia in this decade, ostensibly to train Australian sailors and maintainers in naval nuclear routines as well as to improve forward naval presence.
- On April 4, 2023, the Secretary of the Navy announced that the Fourth Fleet will establish an unmanned task force modeled on the successful Fifth Fleet Task Force 59.<sup>7</sup>

**Strategic Framework.** In December 2020, to address today’s maritime competition more

effectively, the sea services released a naval strategy titled *Advantage at Sea*.<sup>8</sup> It has not yet been fully executed, but there has been some progress regarding forward presence operations that challenge Chinese maritime coercion.<sup>9</sup> To this end, the Navy apparently continues to adjust its deployment patterns to meet new demands caused by the war in Ukraine and increasing tensions in Asia: two carrier strike groups in the Western Pacific (with the exception of four months when only one was present) and a single carrier strike group in the Mediterranean since June 2022. This marks a slight reduction in carrier presence in the Western Pacific from December 2021.<sup>10</sup>

As the U.S. military's primary maritime arm, the Navy is charged with providing the enduring forward global presence that this strategy requires while retaining war-winning forces. The Navy therefore continues to focus its investments on 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 October 2022 *National Security Strategic Guidance*;<sup>11</sup>
- The December 2020 *Advantage at Sea* naval strategy;
- The 2022 *National Defense Strategy* (NDS) (only an unclassified fact sheet has been released to the public);<sup>12</sup> and
- The Global Force Management Allocation Plan (GFMAP).<sup>13</sup>

U.S. official strategic guidance requires the Navy to act beyond the demands of conventional warfighting. China and Russia use their fleets to establish a physical presence in regions that are important to their economic and security interests in order to influence the policies of other countries. To counter their influence, the U.S. Navy similarly sails ships in these waters to reassure allies of U.S. commitments and signal to competitors that they do not have a free hand to impose their will. This means that the Navy must balance two key missions: ensuring that it has a fleet that is ready for war while also using that fleet for peacetime “presence”

operations. Both missions require crews and ships that are materially ready for action and a fleet that is large enough to maintain presence and marshal enough combat power to win in battle.

On July 26, 2022, the Chief of Naval Operations (CNO) released a new Navigation Plan 2022 (NAVPLAN 2022) to provide guidance for the Navy's contribution to the execution of the National Defense Strategy. In this latest edition, the CNO continues his emphasis on forward presence in the United States' daily competition with rivals like China and prioritizes investments in key capabilities like defense against anti-ship missiles and other forms of attack, logistical support capabilities that remain viable in combat, and the ability to share information even when the enemy is targeting the Navy's ability to do so. NAVPLAN 2022 also emphasizes weapons with increased range, new deception capabilities, and improved abilities to make time-critical decisions.<sup>14</sup>

All of this reflects a continuation of demands stemming from the Distributed Maritime Operations concept that has been deemed critical to defeating Chinese anti-access/area denial (A2/AD) capabilities. However, NAVPLAN 2022 lacks a clear timeline either for delivering these capabilities or for ensuring that the fleet is able to employ them in what the CNO acknowledges is a dangerous decade. NAVPLAN 2022 also has added to the several fleet-sizing plans offered by the Navy in recent years, calling for a fleet of 350 manned and 150 unmanned warships along with 3,000 naval aircraft—but without clearly explaining how it will achieve results in a way that the other plans could not.

Lacking a clear operational focus and resourcing strategy, NAVPLAN 2022 has not galvanized political support and has failed to deliver marked improvement either in fleet capabilities or in capacities to deter an increasingly aggressive China. In fact, the most recent long-range shipbuilding plan provides Congress only with a way ahead for a smaller naval force by the end of the decade.<sup>15</sup> Such a disconnect between strategy, plans, and resourcing persists with the latest Battle Force Ship Assessment and Requirement, which indicates that the Navy is short 80 warships (rather than 50) to execute the National Defense Strategy.<sup>16</sup>

This *Index* focuses on the following elements as the primary criteria by which to measure U.S. naval strength:



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

### Capacity

**Force Structure.** The Navy is unique relative to the other services in that its capacity requirements must meet two separate objectives:

1. During peacetime, the Navy must maintain a global presence in distant regions both to deter potential aggressors and to assure allies and security partners.
2. The Navy must be able to win wars. To this end, the Navy measures capacity by the size of its battle force, which is composed of ships it considers directly connected to combat missions.<sup>17</sup>

This *Index* continues the benchmark set in the *2019 Index*: 400 ships to ensure the capability to fight two major regional contingencies (MRCs) simultaneously or nearly simultaneously, as well as a 20 percent strategic reserve, and historical levels of 100 ships that are forward deployed in peacetime.<sup>18</sup> This 400-ship fleet is centered on providing:

- 13 Carrier Strike Groups (CSGs);
- 13 carrier air wings with a minimum of 624 strike fighter aircraft;<sup>19</sup> and
- 15 Expeditionary Strike Groups (ESGs).<sup>20</sup>

Unmanned platforms are not included because they have not matured as a practical asset. They hold great potential and will likely be a significant capability, but until they are developed and fielded in larger numbers, their impact on the Navy’s warfighting potential remains speculative. The

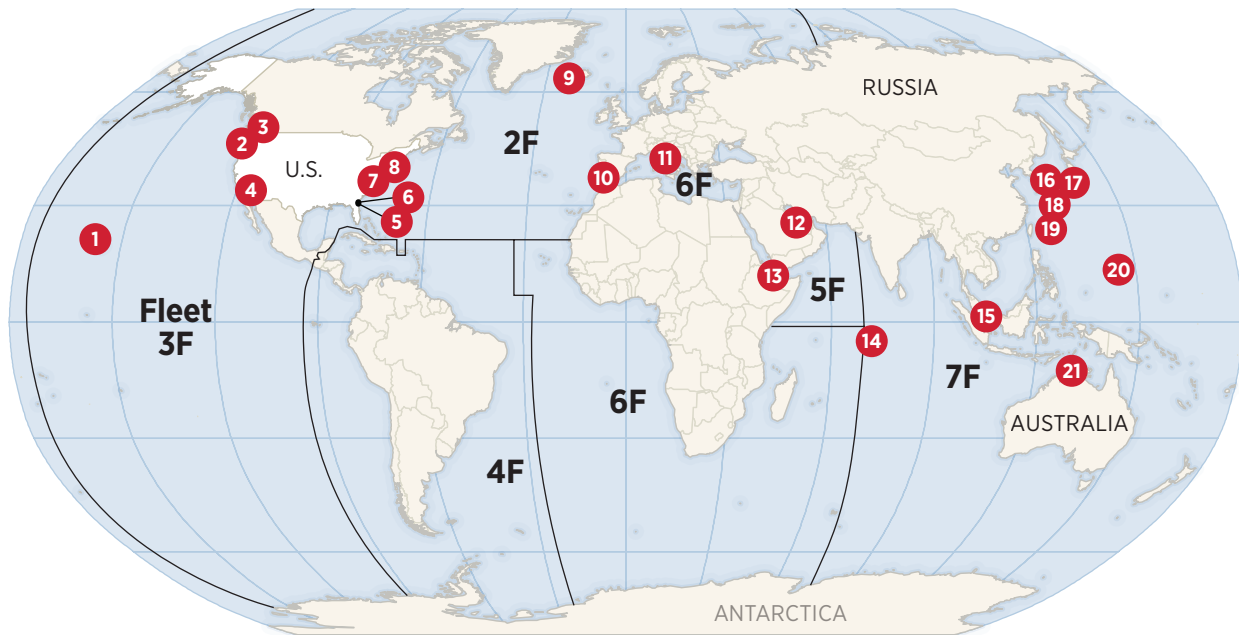
same holds true across the fleet when it comes to new classes of ships. The Navy is investing in research, modeling, war gaming, and intellectual exercises to improve its understanding of the potential utility of new ship and fleet designs, but until new ships are added to the fleet, it is hard to know how they will affect the Navy’s ability to perform its missions. Consequently, this *Index* measures what is known and can be known in naval affairs, assessing the current Navy’s size, modernity, and readiness to perform its most important missions today.

Relative to the above metric, the Navy’s fleet of 297 warships as of August 31, 2023—one ship *less* than a year ago—is inadequate and places greater strain on the ability of ships and crews to meet existing operational requirements. To alleviate the operational stress on an undersized fleet, the Navy has attempted since 2016 to build a larger fleet. However, for myriad reasons, it has been unable to achieve sustained growth and in fact has underdelivered by approximately 10 ships each year since 2016.<sup>21</sup> In the past, the Navy has had some success in meeting operational requirements with fewer ships by posturing ships forward as it has done in Rota, Spain; on Guam; and potentially as part of AUKUS in Australia.

At a February 2022 naval conference, the Chief of Naval Operations stated, “I’ve concluded—consistent with the analysis—that we need a naval force of over 500 ships.”<sup>22</sup> He went on to specify that this fleet would include 12 carriers, 19 to 20 large amphibious warships, more than 30 smaller amphibious ships, 60 destroyers, 50 frigates, 70 attack submarines, and a dozen ballistic missile submarines, all backed by 100 support ships and 150 unmanned vessels. Based on the CNO’s military advice and Heritage Foundation analysis, today’s fleet remains too small to meet today’s threats with maximum effectiveness.

**Posture/Presence.** Although the Navy remains committed to sustaining forward presence, it has struggled to meet the requests of regional Combatant Commanders. The result has been longer and more frequent deployments to meet a historical steady-state forward presence of 100 warships.<sup>23</sup> In 1985, at the height of the Cold War, the percentage of the 571-ship fleet deployed was less than 15 percent, and throughout the 1990s, deployments seldom exceeded the six-month norm: Only 4 percent to 7 percent of the fleet exceeded six-month deployments on an annual basis.<sup>24</sup>

## Key U.S. Naval Installations



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li><b>1</b> Joint Base Pearl Harbor-Hickham, HI<br/>U.S. Pacific Fleet headquarters</li> <li><b>2</b> Naval Base Kitsap</li> <li><b>3</b> Naval Station Everett, WA</li> <li><b>4</b> Naval Base San Diego and Naval Base Coronado, CA<br/>U.S. Third Fleet headquarters</li> <li><b>5</b> Naval Station Mayport, FL<br/>U.S. Fourth Fleet headquarters</li> <li><b>6</b> Naval Submarine Base King's Bay, GA</li> <li><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</li> <li><b>8</b> Naval Submarine Base New London, CT</li> <li><b>9</b> Keflavik, Iceland—Expeditionary Maritime Operations Center</li> <li><b>10</b> Naval Station Rota, Spain</li> </ul> | <ul style="list-style-type: none"> <li><b>11</b> Naval Support Activity Gaeta, Italy<br/>U.S. Sixth Fleet headquarters</li> <li><b>12</b> Naval Support Activity, Bahrain<br/>U.S. Fifth Fleet headquarters</li> <li><b>13</b> Lemonnier, Djibouti—Camp Lemonnier</li> <li><b>14</b> Diego Garcia—Navy Support Facility Diego Garcia</li> <li><b>15</b> Singapore—Commander Logistics Group Western Pacific</li> <li><b>16</b> Buson, South Korea—Fleet Activities Chinhae Navy Base</li> <li><b>17</b> U.S. Fleet Activity Yokosuka, Japan<br/>U.S. Seventh Fleet headquarters</li> <li><b>18</b> U.S. Fleet Activity Sasebo, Japan</li> <li><b>19</b> Okinawa, Japan—Naval Base White Beach</li> <li><b>20</b> Naval Base Guam—Navy Expeditionary Force Command Pacific headquarters</li> <li><b>21</b> Darwin, Australia—Marine Rotational Force Darwin</li> </ul> |
|--|---|

NOTE: Fleet boundaries are approximate.

SOURCE: Heritage Foundation research.

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Using the Navy’s aircraft carrier fleet—the most taxed platform—as a sample set, for 20 years, approximately 25 percent of the aircraft carrier fleet has been deployed. Following the 2017 deadly collisions involving USS *McCain* and USS *Fitzgerald*, the overall fleet deployment percentage dropped temporarily to less than 20 percent, but it surged again to almost 30 percent in 2020.<sup>25</sup> High operational tempo (OPTEMPO) remains an issue as the Navy works to secure U.S. interests against increasing Chinese distant naval deployments and provocations, North Korea’s ballistic missile submarine, Iranian attacks on and interdiction of commercial shipping in the Persian Gulf, and an active Russian Navy.

The numbers as of August 31, 2023, are typical for a total battle force of 297 deployable ships with 74 warships at sea: 41 deployed and underway and 33 underway on local operations for an OPTEMPO of 24.9 percent, well above Cold War levels.<sup>26</sup> 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 (for example, a CSG in Yokosuka, Japan).
- **Forward Stationing.** Only the ships are based abroad, and crews are rotated out to the ship.<sup>27</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 (for example, 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) can provide by offsetting the time needed to transit ships to and familiarize their crews with distant theaters.<sup>28</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>29</sup> To date, the Navy’s use of homeporting and forward stationing has not mitigated the effect of the reduction in overall fleet size on forward presence.

**Shipbuilding Capacity.** To meet stated fleet-size goals, the Navy must build faster and maintain more ships, exceeding its current capacity. However, significant shortfalls in shipyards, both government and commercial, make it hard to accomplish either task, and underfunded defense budgets make it even more difficult. Given the limited ability to build ships, the Navy will struggle to meet the congressionally mandated 355-ship goal,<sup>30</sup> to say nothing of the 400-ship goal advocated in this *Index*.

Since FY 2020 the Navy’s procurement of warships has averaged 12 per year, but only after Congress has added funding above the President’s proposed budget to support an average of three additional warships each year. Moreover, subsequent procurement has not kept pace with the threat from China and does not appear to meet congressional mandates. For example, Congress has mandated that the Navy should achieve a fleet of 12 aircraft carriers,<sup>31</sup> but the number is shrinking to nine (possibly to be augmented by a light carrier that has yet to be defined).<sup>32</sup>

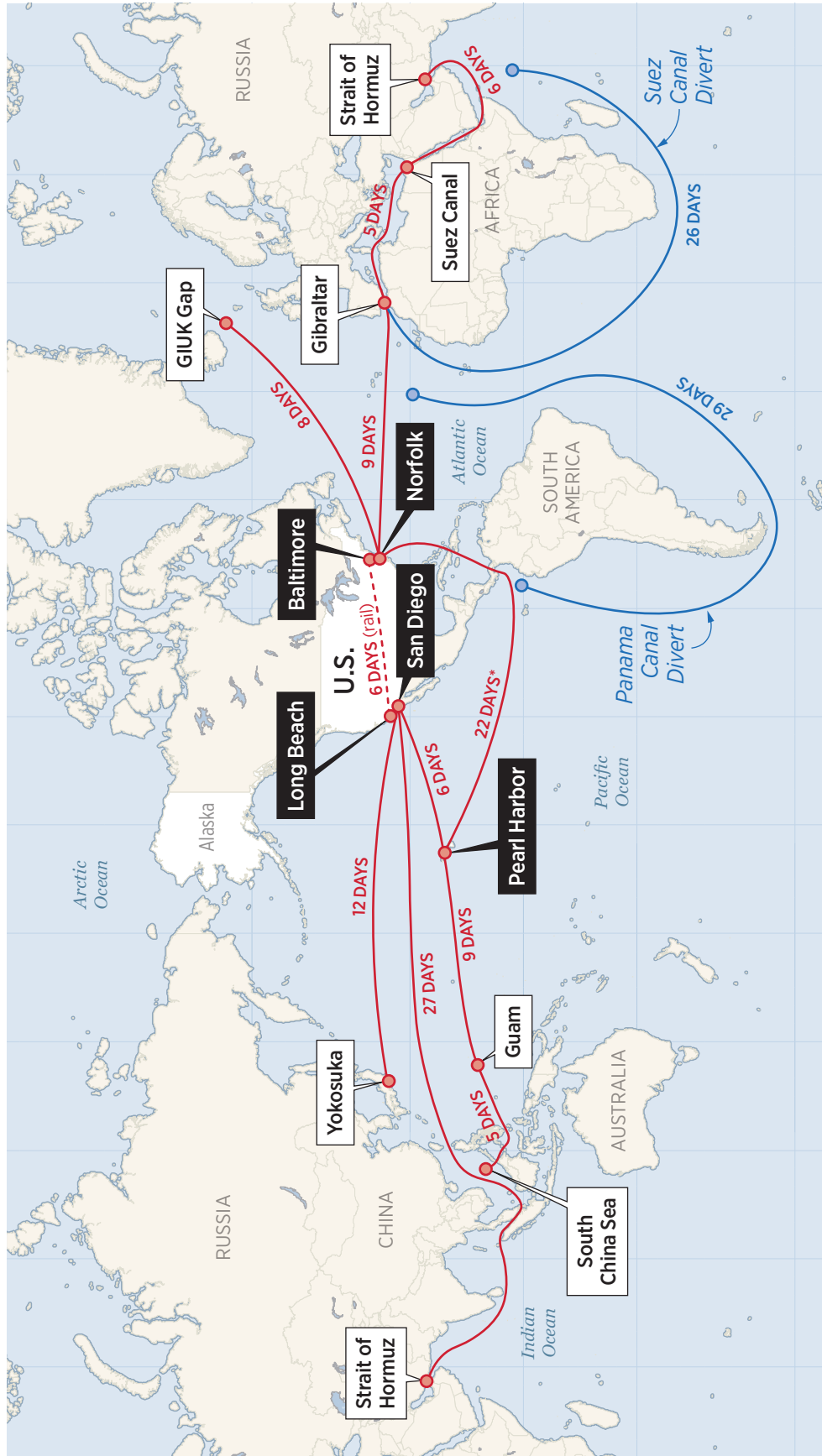
However, it was the Navy’s failure to propose a long-range build plan that met congressional mandates for 31 amphibious warships that boiled over in 2023.<sup>33</sup> World events demonstrated the danger of having inadequate amphibious forces in April 2023 when Americans were stranded amid flaring factional war in Sudan. Marine Corps Commandant General David Berger made clear before the House Armed Services Committee that the lack of “a sea based option” contributed directly to complicating the evacuation of citizens out of harm’s way. Sea-based options are “how we reinforce embassies. That’s how we evacuate them. That’s how we deter.”<sup>34</sup>

Despite such consequences, the current long-range shipbuilding plan does not provide a plan to reverse downward trends in the fleet. Instead, in accordance with the President’s planned procurement over the next five years, the battle force inventory will drop to 280 manned ships by FY 2027.<sup>35</sup>

Meanwhile, diminished demand for ships has led shipbuilders to divest workforce and delay capital investments. From 2005 to 2020, the Navy’s procurement of new warships increased the size of the fleet from 291 to 296 warships; at the same time, China’s navy grew from 216 to 360 warships.<sup>36</sup> If the Navy is to build a larger fleet, more shipbuilders will have to be hired and trained—a lengthy process that precedes any expansion of the fleet. Recent

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

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



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

SOURCE: Heritage Foundation research.

labor statistics comparing 2017 to 2021 show modest progress with total shipbuilding labor involved in production, like welders and pipefitters, adding 3,134 workers.<sup>37</sup> On the other hand, according to the most recent labor statistics, wages in the nation's shipbuilding sector have not kept pace with inflation, growing at 0.4 percent, and the sector has shed 2.6 percent of its already small cadre of professional naval architects and engineers.<sup>38</sup>

Of particular concern is the need to increase the production of nuclear-powered warships, most notably nuclear-powered submarines that would be vital in any conflict with China. Limited nuclear shipbuilding capacity<sup>39</sup> may constrain the Navy's plans to increase the build rate from two attack submarines per year to three while concurrently building one ballistic missile submarine.<sup>40</sup> To support a larger nuclear-powered fleet, the relevant public shipyards increased their workforce by 16 percent from 2013 to 2020,<sup>41</sup> but recent developments indicate that required workforce growth has not continued. The *Virginia*-class attack submarine program is 25 percent below staffing needs with delays of up to two years in delivery of the latest Block V variant, which will deploy large numbers of cruise missiles and potentially hypersonic strike weapons.<sup>42</sup> As demand for nuclear-powered warships increases, to include added demand to support AUKUS, to pace the threat from China and Russia into the foreseeable future, the public shipyards must be able to sustain the recruitment of skilled labor in the numbers needed.

It remains true, according to the Chief of Naval Operations, that current funding will not build or maintain the larger fleet that both the Navy and this *Index* say is needed and that Congress has mandated. Nothing has changed to alter CNO Admiral Michael Gilday's 2021 assessment that current budgets can only "sustain a Navy of about 300 to 305 ships."<sup>43</sup> In addition, the Government Accountability Office (GAO) has noted that a brittle defense industrial base continues to drive up costs and create delays.<sup>44</sup>

**Manpower.** In 2018, the Navy assessed that its manpower would need to grow by approximately 35,000 to achieve an end strength of 360,395 sailors to support a 355-ship Navy.<sup>45</sup> For comparison, the last time the Navy had a similar number of ships was in 1997, when it had 359 ships and a total of 398,847 personnel.<sup>46</sup> As of May 19, 2023, the Navy consisted of 335,187 officers and sailors,<sup>47</sup> down 9,640 from

the 344,824 reported as of June 2022,<sup>48</sup> leading to a growing deficit of 25,208 below what is needed to meet its 2034 fleet goal.

Regrettably, trends for the Navy's personnel budget and for its recruiting and retention efforts are pointing in the wrong direction. Despite the need for more sailors and officers, total end strength has fallen from 344,441 in FY 2022 to an estimated 341,736 in FY 2023 and is trending toward 342,700 in FY 2028.<sup>49</sup> If approved, the most recent budget request would bend this downward curve by raising FY 2024 manning to 347,000,<sup>50</sup> but this is not necessarily a cure for the Navy's recruiting woes. Authorized manning numbers should reflect the fleet needed rather than what can be recruited today, and it remains to be seen whether retention rates can be sustained to meet long-range manning needs. According to data provided by the Navy's Personnel Command, while officer retention has remained relatively flat in recent years, enlisted retention has declined consistently between FY 2018 and FY 2022.

Failing to meet retention goals while at the same time falling short of recruitment goals will place greater demand on a smaller active-duty end strength, and the consequences will be seen in the operational capabilities of the Navy's fleet. The GAO has reported persistent crew manning shortfalls. A GAO report published in May 2021 showed some ships with crew shortfalls as high as 15 percent, which compounded crew fatigue as smaller crews had to make up the workload. This was a contributing factor in fatal collisions in 2017.<sup>51</sup>

Finally, the effort to attract people to join the Navy is made more difficult by wages that are not keeping up with inflated costs of living. In the battle for people, pay raises in recent years have consistently lagged behind inflation, the latest proposed 5.2 percent raise being the first in several years to be slightly ahead of inflation, which stood at 4.9 percent between April 2022 and April 2023.<sup>52</sup>

## Capability

A complete measure of naval capabilities requires an assessment of U.S. platforms against enemy weapons in plausible scenarios. The Navy routinely conducts war games, exercises, and simulations to assess this, but insight into its assessments is limited by their classified nature. This *Index* therefore assesses capability based on

TABLE 10

## Navy Fleet Design

| Platform Class                     | Navy Plan,<br>March 2023 | BY 2027             |                         |                          | BY 2045   |
|------------------------------------|--------------------------|---------------------|-------------------------|--------------------------|---|
|                                    |                          | Recom-<br>mendation | Navy Plan,<br>Dec. 2020 | Navy Plan,<br>March 2023 | Range per<br>Future Naval<br>Force Study,<br>2020 |
| Unmanned (LUSV, MUSV, XLUUV)       | 0*                       | 36                  | 21**                    | 0**                      | 143 to 242  |
| Aircraft Carriers (CVN, CVNE, CVS) | 11                       | 12                  | 10                      | 10                       | 8 to 17   |
| Large Surface Combatant            | 85                       | 110                 | 97                      | 85                       | 73 to 88  |
| Small Surface Combatant            | 33                       | 37                  | 34                      | 23                       | 60 to 67  |
| Logistics and Support Vessels      | 67                       | 90                  | 82                      | 76                       | 96 to 117   |
| Submarines (SSBN, SSGN, SSN)       | 68                       | 77                  | 67                      | 63                       | 84 to 90  |
| Amphibious Warships                | 29                       | 41                  | 32                      | 28                       | 61 to 67  |
| Total Without Unmanned             | 293                      | 367                 | 322                     | 285                      | 382 to 446  |
| Total                              | 293                      | 403                 | 343                     | 285                      | 525 to 688  |

\* As of June 2023, the U.S. Navy had only prototypes in operation for XLUUV, LUSV, and MUSV.

\*\* 21 unmanned vessels were planned for procurement by fiscal year 2026; the long-range plan included no procurement data for unmanned platforms in 2022.

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remaining hull life, mission effectiveness, payloads, and the feasibility of maintaining the platform’s technological edge.

Most of the Navy’s fleet consists of older platforms: Of the Navy’s 20 classes of ships, only eight are in production. However, because Congress added almost \$15 billion to the FY 2023 budget, the proposed \$255.8 billion Department of the Navy budget for FY 2024 represents a real dollar increase of \$11.0 billion, which is a relative increase of 4.5 percent from the previous year, and procurement is set

to increase by two points to 6 percent of the Navy’s budget.<sup>53</sup> The following are highlights by platform.

**Ballistic Missile Submarines (SSBN).** The *Columbia*-class submarine will relieve the aging *Ohio*-class SSBN fleet. Because of the implications of this change for the nation’s strategic nuclear deterrence, the *Columbia*-class SSBN remains the Navy’s top acquisition priority. To ensure the continuity of this leg of the U.S. nuclear triad, the first *Columbia*-class SSBN must be delivered on time for its first deterrent patrol in 2031.<sup>54</sup> In November

2020, the Navy signed a \$9.47 billion contract with General Dynamics Electric Boat for the first-in-class boat and advanced procurement for long-lead-time components of the second hull.<sup>55</sup> The lead ship's keel-laying ceremony occurred on June 4, 2022.<sup>56</sup>

However, concerns persist in Congress that the Department of Defense (DOD) may not be fully utilizing special authorities granted to the Navy to ensure that this critical program is adequately resourced. Specifically, in 2014, Congress established the National Sea-Based Deterrence Fund (NSBDF), which has saved more than \$1.4 billion using flexible funding, but it “has yet to utilize the core function of the NSBDF—namely, to provide increased flexibility to repurpose funds into it to buy down the fiscal impact of the program on our other shipbuilding priorities.”<sup>57</sup>

**Nuclear Attack Submarines (SSN).** SSNs are multi-mission platforms whose stealth enables clandestine intelligence collection; surveillance; anti-submarine warfare (ASW); anti-surface warfare (ASuW); insertion and extraction of special operations forces; land attack strikes; and offensive mine warfare. The newest SSN class, the Block V *Virginia* with the Virginia Payload Module (VPM) enhancement, is important to the Navy's overall strike capacity, enabling the employment of an additional 28 Tomahawk cruise missiles over earlier SSN variants.<sup>58</sup> Construction of Block V submarines began in September 2019 with the *Oklahoma* (SSN 802) to be delivered in May 2027 and three more boats to be delivered before the end of the decade.<sup>59</sup> As noted previously, a limited shipyard workforce is causing this program to be delayed by as many as two years.

The FY 2021 National Defense Authorization Act included additional funds for advanced procurement that preserves a future option to buy as many as 10 *Virginia*-class submarines through the end of the decade. The FY 2024 budget supports this with a sustained build rate of two *Virginia*-class submarines a year through FY 2028. As indicated previously, increasing *Virginia*-class production for AUKUS has raised concerns regarding strain on the industrial base, and the FY 2023 budget put \$1.6 billion toward expansion of the submarine industrial base “to support the Navy plan of serial production of 1 COLUMBIA plus 2 VIRGINIAS starting in FY25/26.”<sup>60</sup> Marks to the FY 2024 proposed defense

budget point to continued congressional support for increased naval shipbuilding capacity.<sup>61</sup>

The effectiveness of such efforts, however, must be measured not by intent, but by results: delivery of warships on time. At the same time, supply-chain quality control is a key factor in submarine construction, and if it is not done well, the consequences can be catastrophic. That is why the premature replacement of critical submarine parts in 2021—parts that are intended to last the life of the boat—remains a concern.<sup>62</sup> Added vigilance will be required as the Navy finds new suppliers to meet future increased submarine production as well as the potential need to provide support to AUKUS.

**Aircraft Carriers (CVN).** The Navy has 11 nuclear-powered aircraft carriers: 10 *Nimitz*-class and one *Ford*-class. The Navy has been making progress in overcoming nagging issues with several advanced systems, notably advanced weapons elevators, and the *Ford*'s first operational deployment in the fall of 2022 to the North Atlantic.<sup>63</sup> Further bolstering confidence in this new class, the *Ford* deployed to the Mediterranean in May 2023 to sustain a persistent carrier presence there following Russia's February 2022 invasion of Ukraine.<sup>64</sup> The second ship in the class, *USS John F. Kennedy* (CVN 79), was christened on December 7, 2019, but its scheduled delivery to the Indo-Pacific theater has slipped from 2022 to 2025 to support late modifications for fifth-generation fighters like the F-35.<sup>65</sup> The *Kennedy* is to be followed by the *Enterprise* (CVN 80), which is in early construction with delivery planned for 2028.

The U.S. lead in this category of naval power may be waning as China completes construction of its first super carrier. As the U.S. Navy struggles to build, maintain, and crew a fleet of 11 aircraft carriers, China is rapidly catching up both in numbers and in platform capability. Its newest carrier, the Type-003, like the *Ford*-class, will utilize electromagnetic catapults that give its air wing greater range and sortie rates, thus greatly narrowing the capability gap.<sup>66</sup> The Type-003 is China's second indigenously built carrier, marking a significant engineering milestone. There had been renewed emphasis on having the ship delivered before the October 2022 Chinese Communist Party (CCP) Congress,<sup>67</sup> and after a sprint by the shipyard, the new 80,000-ton Type-003 aircraft carrier was launched in June 2022.<sup>68</sup> China's growing naval aviation and aircraft

carrier capabilities place added stress on U.S. naval aviation and air defenses.

**Large Surface Combatants.** The Navy's large surface combatants consist of the *Ticonderoga*-class cruiser, the *Zumwalt*-class destroyer, and the *Arleigh Burke*-class destroyer. The President's FY 2024 budget would decommission five of the 13 aged *Ticonderoga*-class cruisers in the Navy's FY 2023 inventory.<sup>69</sup> Should Congress succeed in retaining two of these cruisers, decommissioning of the remaining three would still represent a significant decrement of the Navy's sea-launched firepower with the loss of a total of 366 vertical launch tubes. Attempts to repurpose or extend the life of the aging *Ticonderoga*-class cruisers have yielded mixed results, as deferred upgrades and past incomplete maintenance are driving up operating costs.<sup>70</sup>

In FY 2022, the Navy procured two *Arleigh Burke*-class DDG 51 destroyers, bringing the total on active duty in the fleet to 70, and 14 more have been ordered. Since the Navy declined to pursue a new cruiser in 2008, it has relied on a final iteration of the *Arleigh Burke* class, Flight III, to provide air and missile defense for aircraft carrier strike groups.<sup>71</sup> This will remain a stopgap measure until a more capable new destroyer, DDG(X), joins the fleet, probably in the next decade. The Navy's other modern destroyer, the *Zumwalt* class, was never intended as a cruiser replacement and looks to fill a limited long-range strike role.

The *Zumwalt* class was envisioned as bringing advanced capabilities to the fleet, but the program has suffered technological problems and cost overruns, and the Navy has not indicated that it intends to acquire more than the three that have already been purchased and are being built out: the USS *Zumwalt* (DDG-1000), which was delivered on April 24, 2020; USS *Michael Monsoor* (DDG-1001), which was commissioned on January 26, 2019; and USS *Lyndon B. Johnson* (DDG-1002), which is completing checks before delivery to the Navy in 2024.<sup>72</sup> The *Zumwalt* is currently based in San Diego, but its initial operational capability (IOC) has been delayed by a year, overlapping with plans to install the Navy's new hypersonic weapons system, conventional prompt strike (CPS), beginning in October 2023 with the remaining two ships to receive the system in due course.<sup>73</sup> Reports in September 2022 indicated that the *Zumwalt* had conducted its first

deployment, albeit truncated, to Seventh Fleet's Western Pacific area of operations.<sup>74</sup>

To reach 355 ships by 2034, the Navy plans several class-wide service life extensions, notably the extension of the DDG-51-class's service life from 35 to 40 years and modernization of older hulls. The FY 2020 budget included \$4 billion for modernization of 19 destroyers from FY 2021 through FY 2024.<sup>75</sup> The previously noted planned decommissioning of five cruisers in FY 2023 makes this more critical.

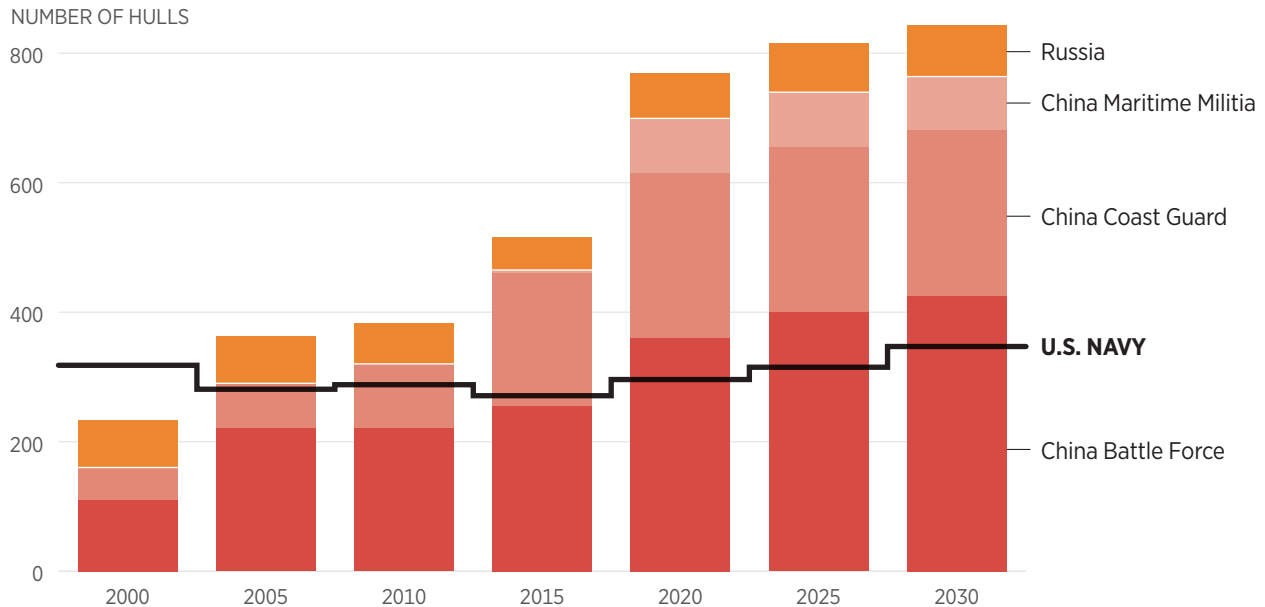
**Small Surface Combatants.** The Navy's small surface combatants consist principally of the *Avenger*-class mine countermeasures (MCM) ship; the Littoral Combat Ship (LCS); and the *Constellation*-class frigate (FFG), which began production in 2021. In January 2021, the Navy halted production of the mono-hull LCS *Freedom*-variant until issues involving the design of its propulsion system are resolved. After that decision was made, in April 2023, the final *Freedom* variant was launched.<sup>76</sup> In the meantime, the top speed of affected ships (currently 40-plus knots) is reportedly limited to 34 knots.<sup>77</sup> Under the Navy's FY 2020 30-year shipbuilding plan, the fleet of 23 LCSs was expected to grow to 34 and be joined by 18 frigates by FY 2034.<sup>78</sup> Since then, the Navy has reversed course and terminated the LCS anti-submarine mission module program (10 units originally planned) and plans to decommission the remaining nine *Freedom* monohull variants.<sup>79</sup>

On August 20, 2020, the Navy decommissioned three of its aging *Avenger*-class MCM ships, leaving eight in service overseas in Sasebo, Japan, and Manama, Bahrain. These represent the only ship class dedicated to countering the mine threat.<sup>80</sup> The current long-range shipbuilding plan confirms that the Navy intends to operate these aged MCMs through FY 2027.<sup>81</sup>

As these ships reach the end of their service life, the Navy is relying on the development of LCS mine countermeasure mission packages to provide this capability. At an April 2022 webinar, the CNO indicated that these mission modules were on track to reach IOC by the end of 2022.<sup>82</sup> Since then, the Navy has canceled its ASW mission modules because of insurmountable engineering challenges, and on May 1, 2023, it announced that the MCM modules had achieved initial operational capability.<sup>83</sup> In an unanticipated move, the Navy began to



## U.S. vs. China and Russia Navies: Fleet Expansion Trends



**NOTE:** U.S. figures are actual through 2020. Figures for 2025 and 2030 are from the Navy's December 2020 30-year shipbuilding plan. See U.S. Navy, Office of the Chief of Naval Operations, Deputy Chief of Naval Operations (Warfighting Requirements and Capabilities–OPNAV N9), *Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels*, December 9, 2020, [https://media.defense.gov/2020/Dec/10/2002549918/-1/-1/1/SHIPBUILDING%20PLAN%20DEC%2020\\_NAVY\\_OSD\\_OMB\\_FINAL.PDF](https://media.defense.gov/2020/Dec/10/2002549918/-1/-1/1/SHIPBUILDING%20PLAN%20DEC%2020_NAVY_OSD_OMB_FINAL.PDF) (accessed September 9, 2023).

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arm LCS with the naval strike missile, giving these ships a long-range anti-ship capability that they had lacked despite notable operations by the class in the South China Sea.<sup>84</sup> On December 9, 2021, the San Diego-based *Independence*-variant *Oakland* received this new capability.<sup>85</sup> Installation and procurement of surface warfare modules and associated surface-to-surface missile modules (LCS SSMM) is progressing; the procurement of 18 LCS

SSMM planned for FY 2024 includes offensive and defense systems and associated munitions.<sup>86</sup>

Instead of requesting additional LCS, the Navy has focused on a new frigate. On April 30, 2020, the Navy awarded Fincantieri a \$795 million contract to build the lead ship of the new *Constellation*-class frigate at its Marinette Marine shipyard in Wisconsin based on a proven design currently in service with the French and Italian navies.<sup>87</sup> While the

design for the U.S. ship has not been finalized, the frigate is intended to be a multi-mission warship with 32 VLS cells, as many as 16 containerized naval strike missiles (NSM), and one helicopter.<sup>88</sup> As of June 2023, 90 percent of function design and 80 percent of detail design work had been completed despite construction having already begun with some risk of program delay and cost increase.<sup>89</sup> In May 2021, the Navy contracted for the second ship in the class, the USS *Congress* (FFG-63).<sup>90</sup> The Navy purchased a third ship in FY 2022 and plans to purchase two more in FY 2024. The Navy has awarded Fincantieri a \$526 million contract for a fourth frigate, but a decision for a second shipyard to begin construction of frigates that was to be made in FY 2023 has been delayed, and this could affect future production rates.<sup>91</sup>

**Amphibious Ships.** Commandant of the Marine Corps General David Berger issued his “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 to support an amphibious force of two Marine Expeditionary Brigades (MEB).<sup>92</sup> The Commandant envisioned a larger yet affordable fleet of smaller, low-signature amphibious ships—the Landing Ship Medium (LSM)<sup>93</sup>—that enable littoral maneuver and associated logistics support in a contested theater.<sup>94</sup> However, the amphibious fleet remains centered on fewer large ships. This vision remains years away from being realized with Congress holding the line at “not less than 31 operational amphibious warfare ships.”<sup>95</sup>

The Navy’s Future Naval Force Study (FNFS)<sup>96</sup> and December 2020 30-year shipbuilding plan acknowledged the growing importance of the LSM, which will have to be produced rapidly and in sufficient numbers in order to actualize the naval forces’ distributed concepts of operations (for example, Marine Littoral Regiments and Distributed Maritime Operations). According to the April 2022 long-range shipbuilding plan, the Navy intends to purchase the first LSM in FY 2025. The Marine Corps had intended to have the ship under contract by the summer of 2022, but because of delays, it has begun to use alternative platforms to train and work out operational concepts so that it will be ready when the ship eventually is delivered.<sup>97</sup>

As of September 2023, the Navy had nine amphibious assault ships in the fleet (seven *Wasp*-class LHD and two *America*-class LHA); 12 amphibious transport docks (LPD); and 10 dock landing ships (LSD).<sup>98</sup> The FY 2021 budget included \$250 million in additional funds to accelerate construction of LHA-9 following the July 2020 catastrophic fire on *Bonhomme Richard* (LHD-6).<sup>99</sup> The decision to decommission the damaged ship further exposed limitations in shipyard capacity, as repairs would have had a negative effect on other planned shipbuilding and maintenance.<sup>100</sup> In December 2022, construction began on the USS *Fallujah* (LHA-9), which, like the *Bonhomme Richard*, is to be configured for F-35B joint strike fighters and MV-22 Osprey tilt-rotor aircraft, at a cost of \$2.4 billion.<sup>101</sup>

The Navy’s LSDs, the *Whidbey Island*-class and *Harpers Ferry*-class amphibious vessels, are scheduled to reach the end of their 40-year service lives beginning in 2025. The USS *Harrisburg* (LPD-30) of the *San Antonio*-class Landing Platform Dock amphibious ships began construction in April 2020 and when delivered will be the first of 13 *San Antonio*-class Flight II ships to replace the legacy LSD ships. The 12th first flight *San Antonio*-class ship (LPD 28) was delivered six months later than reported in the *2022 Index*.<sup>102</sup>

The FY 2021 budget included \$500 million “to maximize the benefit of the amphibious ship procurement authorities provided elsewhere in this Act through the procurement of long lead material for LPD-32 and LPD-33.”<sup>103</sup> The Navy’s FY 2023 budget funded LPD-32 with a \$1.295 billion contract for the ship’s construction.<sup>104</sup> LPD-32 is the most recently purchased of the 13 Flight IIs that were originally envisioned. The Marine Corps has sought procurement of LPD-33 and has kept it at the top of its unfunded requirements list.<sup>105</sup> The three-way dispute among the Secretary of Defense’s staff, the Navy, and the Marine Corps over the future of the large amphibious warship fleet remains contentious and unresolved.<sup>106</sup>

**Unmanned Systems.** The Navy does not include unmanned ships in counting its battle force size. Previous long-range shipbuilding plans envisioned the purchase of 13 Large Unmanned Surface Vessels (LUSV); one Medium Unmanned Surface Vessel (MUSV); and eight Extra Large Undersea Unmanned Vessels (XLUUV) by FY 2026.<sup>107</sup> The Navy continues to test and evaluate seven prototype

unmanned platforms, five of which are to be delivered by FY 2028. Additionally, current plans call for procurement of the LUSV to begin in FY 2025 and increase to three per year beginning in FY 2027.<sup>108</sup> On May 18, 2021, an experimental LUSV, the *Nomad*, transited the Panama Canal on its way to Surface Development Squadron (SURFDESRON) 1 based in California.<sup>109</sup> SURFDESRON 1 operates MUSV *Sea Hunter* prototypes, LUSV, and the *Zumwalt* destroyer to advance the Navy's unmanned surface warship capabilities.<sup>110</sup> Since publication of the *2023 Index*, the Navy has made notable progress with its unmanned fleet.

The Navy reached a significant milestone in September 2021 when its small fleet of unmanned surface ships launched and hit a target with an SM-6 interceptor missile.<sup>111</sup> After years in a laboratory and in controlled at-sea navigational tests, unmanned ships are now deploying in operational settings. That same month, Task Force 59, based in the Persian Gulf and comprised of smaller unmanned drones and vessels, conducted International Maritime Exercise 2022 (IMX22), an exercise in the Red Sea that involved 10 nations and more than 80 unmanned platforms.<sup>112</sup> In a sign of growing confidence, the Navy announced that it will establish a similar unmanned vessel task force at Fourth Fleet based in Mayport, Florida.<sup>113</sup>

**Logistics, Auxiliary, and Expeditionary Ships.** Expeditionary support vessels are highly flexible platforms of two types: those used for prepositioning and sustaining forward operations and others used for high-speed lift in uncontested environments. The Navy has five of the former (two Expeditionary Transfer Dock [ESD] and three Expeditionary Sea Base [ESB] vessels) and 12 of the latter (shallow-draft Expeditionary Fast Transport [EPF] vessels). In March and April 2022, ESB *Hershel Williams* (ESB 4) demonstrated the versatility of these ships during maritime security missions with African coast guards and navies. In August 2021, it conducted a counter-piracy exercise with the Brazilian navy. At the same time, China was attempting to secure a base in Equatorial Guinea.<sup>114</sup> The Navy christened ESB 6, USNS *John L. Canley*, on June 25, 2022.<sup>115</sup> ESB 7, USNS *Robert E. Simanek*, is currently under construction in San Diego, California, with its keel having been laid in October 2021.<sup>116</sup>

With their shallow draft and versatile cargo capacity, EPFs offer unique capabilities that are well

suited to austere but uncontested waters. Specifically, these ships can transport 600 short tons of military cargo (for example, main battle tanks) 1,200 nautical miles at 35 knots. The Navy christened its 13th EPF, the USNS *Apalachicola*, on November 13, 2021, and construction is progressing.<sup>117</sup> In March 2021, the Navy revised its contract with Austal USA for \$235 million to modify EPF 14 and the future EPF 15 to enable them to serve as high-speed hospital ships with the capability of embarking a V-22 tilt-rotor aircraft.<sup>118</sup> The keel for EPF 14 configured as a hospital ship was laid on January 26, 2022, and construction of EPF 15 in the same configuration commenced the same month.<sup>119</sup> EPF 14, USNS *Cody*, was launched on March 20, 2023.<sup>120</sup>

The Navy's Combat Logistics Force (CLF) includes dry-cargo and ammunition ships (T-AKE); fast combat support ships (T-AOE); and oilers (AO). The CLF provides critical support, including at-sea replenishment, that enables the Navy to sustain the fleet at sea for prolonged periods. The Navy's future oiler *John Lewis* (T-AO 205) was procured in 2016 and launched five years later on January 12, 2021; 20 ships of this class are planned.<sup>121</sup> However, because of a flooding incident at the graving dock, delivery of *John Lewis* was delayed, and this in turn caused cascading delays of 12 to 15 months in construction of the second through sixth ships.<sup>122</sup> The lead ship of the class, *John Lewis*, was delivered to the Navy in July 2022, and three ships of the class are currently under construction.<sup>123</sup>

Secretary of Defense Lloyd Austin's March 7, 2022, decision to dismantle Red Hill fuel storage facilities in Hawaii will generate additional pressure to increase the Navy's at-sea oiler fleet to meet operational needs in the Pacific. A plan specifying how the Navy will mitigate the loss of these massive Pacific fuel storage facilities was due by May 31, 2022.<sup>124</sup> As of June 16, 2023, the details of this plan had not been made public, and it remains uncertain, given delays in the construction of oilers, exactly how the fleet's operational energy needs will be met.<sup>125</sup>

**Strike Platforms and Key Munitions.** The FY 2024 budget continues the Navy's focus on long-range offensive strikes launched from ships, submarines, and aircraft. Notable capability enhancements include, for example, Conventional Prompt Strike (CPS), a maneuverable hypersonic non-nuclear weapon for long-range strikes that

receives support for initial deployment on the *Zumwalt*-class destroyer in FY 2025, and upgraded Block V Maritime Strike Tomahawk (MST) kits with improved targeting, procurement of which is entering its fourth year.<sup>126</sup>

To counter the threat posed by the Chinese PL-15 long-range air-to-air missile, which has an operational range of 186 miles, the Navy is working with the Air Force to develop the AIM-120 Advanced Medium-Range missile, the operational range of which has not been made public.<sup>127</sup> In March 2021, the Air Force reported a record long-range kill of a drone target by this developmental missile from one of its F-15C fighters.<sup>128</sup> If this report is accurate, it indicates development of a critical capability, but little reporting on progress has been noted since the *2023 Index*.

**Shore-Based Anti-Ship Capabilities.** Following the August 2019 U.S. withdrawal from the Intermediate-Range Nuclear Forces (INF) Treaty, new intermediate-range (500–1,000 miles) conventional ground-launched strike options became politically viable. This is especially important in Asia where such capable missiles deployed to the first island chain would have great relevance in any conflict with China.<sup>129</sup>

The FY 2020 budget included \$76 million to develop ground-launched cruise missiles.<sup>130</sup> The FY 2021 budget included an additional \$59.6 million to procure 36 ground-based anti-ship missiles.<sup>131</sup> The FY 2023 budget funded low-rate initial production of 115 Naval Strike Missiles and associated development of Marine Corps platoon-level targeting systems.<sup>132</sup> The FY 2024 budget, building on recent successes, continues upward investment in development and increased production of these weapon systems: \$363.5 million for the Navy–Marine Expeditionary Ship Interdiction System (NMESIS) anti-ship missile; 34 shore-launched tactical Tomahawk missiles; and 90 Naval Strike Missiles.<sup>133</sup> A photo of the launch of a U.S. Marine Corps truck-mounted Naval Strike Missile—ostensibly part of NMESIS—was released in April 2021, revealing efforts to introduce this weapon capability across naval forces.<sup>134</sup> Ukraine’s use of shore-based anti-ship missiles to sink Russia’s Black Sea flag ship, the *Moskva*, in April 2022 has sparked renewed interest in such systems.

**Electronic Warfare (EW).** The purpose of electronic warfare is to control the electromagnetic

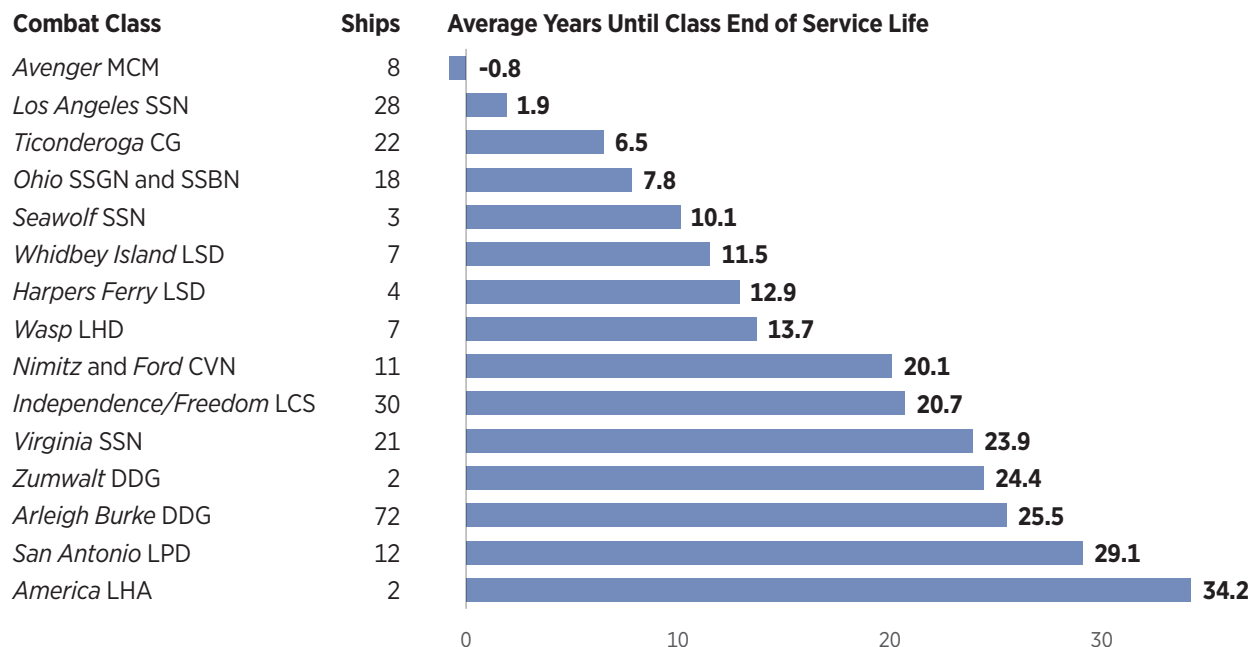
spectrum (EMS) by exploiting, deceiving, or denying its use by an enemy while ensuring its use by friendly forces. It is therefore a critical element of successful modern warfare. The final dedicated EW aircraft, the EA-18G Growler, was delivered in July 2019, meeting the Navy’s requirement to provide this capability to nine carrier air wings (CVW), five expeditionary squadrons, and one reserve squadron.<sup>135</sup> Anticipating the EA-18G’s retirement in the 2030s, the Navy has been exploring follow-on manned and unmanned systems, but no new developments on a replacement have been reported since publication of the *2023 Index*. To ensure that the EA-18G remains relevant on the battlefield until 2030, an anticipated upgrade or Block II modification with the improved Next Generation Electronic Attack Unit (NGEAU) is being pursued.

The Navy’s earlier proposal to retire all of its expeditionary electronic attack squadrons by FY 2025 came as a surprise.<sup>136</sup> Unless there is a replacement capability, retirement of these aircraft removes the EW coverage provided by these units from forward airfields, shifting the support burden to nearby naval platforms and the other services. Given this uncertainty, Congress stipulated in the FY 2023 NDAA that the Secretary of the Navy may not retire an EA-18G aircraft until September 30, 2027, and required that no later than 180 days after the NDAA’s enactment, “the Secretary of the Navy and the Secretary of the Air Force shall jointly submit to the congressional defense committees a report that includes a strategy and execution plan for continuously and effectively meeting the airborne electronic attack training and combat requirements of the joint force.”<sup>137</sup> The status of that report is unknown.

**Air Early Warning.** The E-2D forms the hub of the Naval Integrated Fire Control Counter Air (NIFC-CA) system and provides critical theater air and missile defense capabilities. The Navy’s FY 2021 budget supported the procurement of four aircraft with an additional 10 to be procured over the following two years.<sup>138</sup> The FY 2023 budget completed this plan by including procurement of the final five new E-2D aircraft, which are important air control platforms.

**High Energy Laser (HEL).** HEL systems provide the potential to engage targets or shoot down missiles without being limited by how much ammunition can be carried onboard ship. A significant milestone was achieved when USS *Portland*

## Navy Combat Ships Nearing End of Service Life



**NOTE:** Figures are based on calculations for June 2023.

**SOURCE:** U.S. Navy, Naval Sea Systems Command, Naval Vessel Register, "Fleet Size," <http://www.nvr.navy.mil/NVRSHIPS/FLEETSIZ.HTML> (accessed September 9, 2023).

 heritage.org

(LPD-27) used its HEL Weapon System Demonstrator to shoot down an unmanned aerial vehicle (UAV) over the Pacific on May 16, 2020.<sup>139</sup> This was followed by the Navy's decision to begin installation of a HEL system—the High-Energy laser with Integrated Optical Dazzler and Surveillance (HELIOS) (60 kW) laser<sup>140</sup>—on destroyers in 2021 beginning with the USS *Preble*.<sup>141</sup> HELIOS is a scalable laser system that is integrated into the ship's weapons control and radar systems and can dazzle and confuse threats, disable small boats, or shoot down smaller air threats. The Navy's FY 2024 budget will sustain the installation of HELIOS on the USS *Preble* and develop a 100 kW HEL demonstrator system on the USS *Portland*, representing modest investment and progress.<sup>142</sup>

In April 2022, the Navy demonstrated the ability of its Layered Laser Defense HEL system to shoot down a drone simulating a cruise missile.<sup>143</sup>

Successful tests like this and the ongoing deployment of the HELIOS on the destroyer *Preble* will be followed by installation of a much stronger 100 kW laser on *Portland* (LPD-27) that approaches the power needed for missile defense.<sup>144</sup> However, until field testing against meaningful threat platforms is conducted across a range of weather conditions, the effectiveness of such systems will remain unproven.

**Command and Control.** Networked communications are essential to successful military operations. The information passed over these networks includes sensitive data on such subjects as targeting and logistics, and this makes cyber security, communications, and the information systems that generate and relay this information critical elements of the DOD information enterprise.

On October 1, 2020, CNO Michael Gilday signed two memos establishing Project Overmatch. The

goal of Project Overmatch was to achieve situational awareness and effective command and control of a geographically dispersed naval force. In his two memos, the CNO directed that investments be made to deliver network architectures, unmanned capabilities, and data analytics to ensure that the Navy can operate and dominate in a contested environment.<sup>145</sup> The CNO also directed the Navy to leverage related Air Force efforts on the Joint All-Domain Command and Control program (JADC2),<sup>146</sup> now a Joint Force effort involving all of the military branches.

Remarkably, despite the significance of the effort, little has been publicly released on Project Overmatch; what is known is that it involves three classified funding lines with initial deployment or program capabilities slated for 2023.<sup>147</sup> In unofficial venues, it has been hinted that the first platform to employ JADC2 capabilities will be an aircraft carrier, but public statements indicate that the objective is to connect all platform data flows from across the U.S. Joint Force (potentially including partner forces), analyze them for classification, and make predictive targeting recommendations. If successful, artificial intelligence paired with resilient communications and “big data” analytics might enable a key element of Distributed Maritime Operations (DMO).

## Readiness

In the 1980s, the Navy had nearly 600 ships in the fleet and kept roughly 100 (17 percent) deployed at any one time. As of June 10, 2023, the fleet’s OP-TEMPO was 28 percent. With fewer ships carrying an unchanging operational workload, training schedules become shorter and deployments become longer. The commanding officer’s discretionary time for training and crew familiarization is a precious commodity that is made scarcer by the increasing operational demands on fewer ships.

FY 2019 marked the first time in more than a decade that DOD and the Navy did not have to 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 to continue on its path to restoring fleet readiness. CNO Admiral John Richardson explained to the Senate Armed Services Committee in April 2018 that it would take until late 2021 or 2022 to restore fleet readiness to an “acceptable”

level if adequate funding was maintained; without “stable and adequate funding,” it would take longer.<sup>148</sup> Unfortunately, the Navy began FY 2020 under another continuing resolution that delayed planned maintenance for the USS *Bainbridge* (DDG 96) and USS *Gonzalez* (DDG 66), revealing yet again that for the Administration and Congress, the need to correct deficiencies in America’s naval power was not enough to ensure that they delivered a budget on time.<sup>149</sup>

Given this recent history and the demands of unplanned and urgently needed ship repairs brought about by such incidents as the grounding of the submarine *Connecticut*, the Navy remains deficient in its ability to return ships to sea.

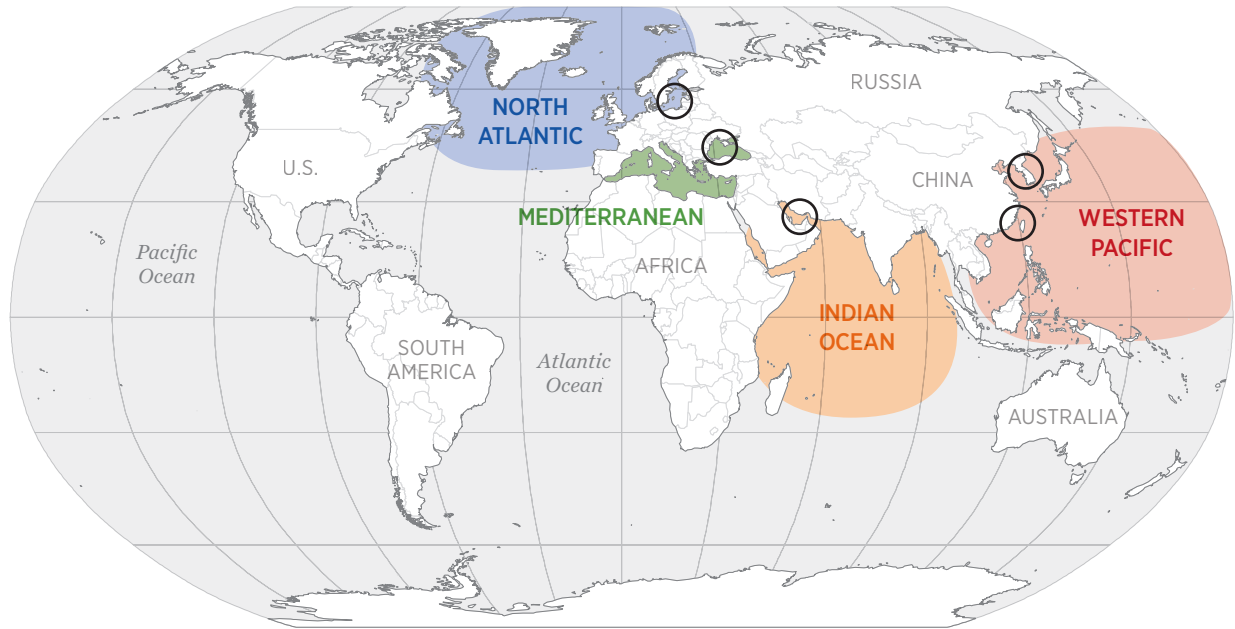
**Impact of COVID-19.** The eruption of the COVID-19 pandemic in 2020 caused many problems for the U.S. Navy. The USS *Theodore Roosevelt* (CVN 71), for example, was forced to quarantine for 55 days in Guam; the major biannual international Rim of the Pacific Exercise (RIMPAC) was scaled down; 1,629 reservists were called to active duty to backfill high-risk shipyard workers conducting critical maintenance; and the Navy was restricted to using “safe haven” COVID-free ports. In May 2021, the CNO assessed that the Navy managed the pandemic with minimal operational impact but with added time at sea and delays for family reunions pending quarantines.<sup>150</sup>

As the pandemic recedes, the Navy’s response to account for and mitigate the effects of COVID-driven restrictions has been a success overall. According to the Navy’s February 10, 2023, final COVID report, total cumulative COVID cases among active-duty uniformed Navy personnel numbered 109,310 with 17 deaths, 3,350 unvaccinated servicemembers remaining on active duty, and a total of 1,878 sailors separated for refusing the vaccine; previous reporting indicated that 214 religious waivers were granted.<sup>151</sup> Given vaccination rates and ebbing danger, the Navy appears to be past the COVID epidemic. Ideally, the Navy would implement lessons learned from this experience to prepare for future pandemics and biological attacks, but there is as yet little evidence that the service has conducted such a study, implemented new pandemic guidelines, or sought new capabilities to combat a future pandemic.

**Maintenance and Repairs.** Naval Sea Systems Command completed its Shipyard Optimization and Recapitalization Plan in September 2018.<sup>152</sup>

# U.S. Navy Global Presence

○ Potential sites for major war



| WEEKS CSG,<br>ARG/ESG PRESENT<br>IN REGION | NORTH ATLANTIC |             |       | MEDITERRANEAN |             |       | INDIAN OCEAN |             |       | WESTERN PACIFIC |             |       |
|--|----------------|-------------|-------|---------------|-------------|-------|--------------|-------------|-------|-----------------|-------------|-------|
|  | CSG            | ARG/<br>ESG | TOTAL | CSG           | ARG/<br>ESG | TOTAL | CSG          | ARG/<br>ESG | TOTAL | CSG             | ARG/<br>ESG | TOTAL |
| June 2021–June 2022                        | 1              | 10          | 11    | 22            | 0           | 22    | 22           | 35          | 57    | 77              | 42          | 119   |
| June 2022–June 2023                        | 10             | 18          | 28    | 47            | 0           | 47    | 0            | 0           | 0     | 86              | 54          | 140   |
| CHANGE                                     | +9             | +8          | +17   | +25           | 0           | +25   | -22          | -35         | -57   | +9              | +12         | +21   |

**NOTES:** CSG — Carrier Strike Group, ARG — Amphibious Ready Group, ESG — Expeditionary Strike Group.

**SOURCE:** Heritage Foundation research based on data from U.S. Naval Institute News, “Category Archives: Fleet Tracker,” <https://news.usni.org/category/fleet-tracker> (accessed September 9, 2023).

heritage.org

Four years later, the improvement of public shipyard capacities is still just beginning. It was expected that the initial step—building digital models to inform future upgrades to the Navy’s four public shipyards—would be complete by the end of 2021, but it remained incomplete as of June 2022.

Attempts by Congress to accelerate the effort have not been effective.<sup>153</sup> At a May 10, 2022, Senate hearing, it became apparent both that the original costs were significantly underestimated and that timelines are slipping. During that hearing, the Government Accountability Office reported that:

- “[F]rom 2017 to 2020, the backlog of restoration and modernization projects at the Navy shipyards has grown by over \$1.6 billion, an increase of 31 percent.”<sup>154</sup>
- “In 2018, the Navy estimated that it would need to invest about \$4 billion in its dry docks to obtain the capacity to perform the 67 availabilities it cannot currently support. This estimate included 14 dry dock projects planned over [a] 20-year span. However...the Navy’s first three dry dock projects have grown in cost from an estimated \$970 million in 2018 to over

\$5.1 billion in 2022, an increase of more than 400 percent.”<sup>155</sup>

- “In a 2021 report to Congress, the Navy stated it would complete the [Area Development Plans] by fiscal year 2021. However, in a September 2021 update of that report, the Navy stated the ADPs would be complete four years later, in fiscal year 2025.”<sup>156</sup>

More recently, the GAO assessed the Navy’s readiness from 2017 through 2021. Because of persistent problems, the Navy’s readiness was assessed as degrading: Ship maintenance backlogs were estimated at \$1.8 billion, conditions at public shipyards remained poor, and enduring issues of crew shortfalls and fatigue delayed maintenance activities.<sup>157</sup> On top of this, new reports indicate that 37 percent of the Navy’s submarine force is unavailable in FY 2023 for missions at sea because of maintenance backlogs; a more normal rate would be 20 percent.<sup>158</sup>

#### **Training, Ranges, and Live-Fire Exercises.**

Ship and aircraft operations and training are critical to fleet readiness. The Navy has sought to meet fleet readiness requirements by funding 58 underway days for each deployed warship and 24 underway days for each non-deployed warship per fiscal quarter. The Navy’s proposed budget would fall short of these goals by funding 97 percent of ship operations, 90 percent of flight hours, and 87 percent of facilities sustainment.<sup>159</sup> Less clear is how much of this time is spent on crew training and whether the Navy assesses this as effective in meeting needed operational proficiencies.

To improve warfighting proficiency, 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>160</sup> This training range fits into the larger five-year \$27.3 billion Pacific Deterrence Initiative (PDI) that, led by Indo Pacific Command, is intended partly to transform the way the Navy trains for high-end conflict and improve training with U.S. allies in the Pacific.<sup>161</sup> Of particular importance to the Navy are PDI investments to modernize the Pacific Missile Range Facility (PMRF); the Joint Pacific Alaska Range Complex (JPARC); and the Combined/Joint Military Training (CJMT) Commonwealth Northern Mariana Islands in order to

improve training for operations across all domains: air, land, sea, space, and cyber.<sup>162</sup>

The FY 2024 budget earmarks \$9.1 billion of DOD’s topline budget for PDI (\$3 billion more than in FY 2023). Especially important are long lead time infrastructure projects in Guam and Tinian in the northern Marianas. This year’s PDI budget includes \$3.25 billion for the Navy: \$1.15 billion for operations, \$14.6 million for logistics, \$313.3 million for exercises, \$1.58 billion for infrastructure investments, \$42.8 million for added staffing, and \$146.7 million to improve partner nations’ capabilities.<sup>163</sup> To measure the effectiveness of these investments, the Navy will need to demonstrate increased frequency of exercises that practice high-end warfighting independently, jointly, and with such key allies as Australia, Japan, and South Korea. This should include increased numbers of realistic free-play events and increased by-hull frequency of live-fire drills.

Finally, not forgotten are the 2017 collisions of the USS *John S. McCain* (DDG 56) and USS *Fitzgerald* (DDG 62) in which 17 sailors were lost. Findings of the subsequent investigations, which highlighted the importance of operational risk management and unit readiness, remain relevant.<sup>164</sup> To ensure that these tragic events are not repeated, the Secretary of the Navy’s *Strategic Readiness Review* made several broad institutional recommendations:

- “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>165</sup>



A reminder that the above recommendations remain relevant was the October 2021 grounding of the submarine *Connecticut* in the South China Sea. The subsequent investigation found the event

avoidable while operating in poorly surveyed waters—a reminder of the risk as well as the vigilance required at sea.<sup>166</sup>

## Scoring the U.S. Navy

### Capacity Score: Very Weak

This *Index* assesses that the Navy needs a battle force consisting of 400 manned ships to do what is expected of it today. The Navy’s current battle force fleet of 298 ships and intensified operational tempo combine to reveal a service that is much too small relative to its tasks. Contributing to a lower assessment is the Navy’s persistent inability to arrest and reverse the continued diminution of its fleet as adversary forces grow in number and capability. If it continues on its current trajectory, the Navy will shrink further to 280 ships by 2037. Depending on the Navy’s ability to realize aggressive growth, reverse early decommissioning plans, increase its end strength, and develop creative service life extensions, its capacity score will probably remain “very weak” for the foreseeable future.

### 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 and the rapid growth of competitor navies with modern technologies has only intensified the danger for U.S. naval power. Without meaningful progress in fielding systems that are able to defend

against an array of threats, greater integration of unmanned systems into the fleet, and development of a family of new long-range weapons, especially in air-to-air combat, the Navy’s capability score could well decline to “weak” in the *2025 Index*.

### Readiness Score: Weak

The Navy’s readiness score remains “weak.” This is due primarily to the Navy’s persistent struggle to recapitalize antiquated, inadequate maintenance infrastructure and workforce to meet current needs. The effectiveness of training and exercises measured against China will be an increasingly critical metric in this score.

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

The Navy’s overall score in the *2023 Index* is “weak,” driven by lower scores in capacity and readiness. To correct this trend, the Navy will have to eliminate several readiness and capacity bottlenecks while seeing to it that America has an operational fleet with the numbers and capabilities postured to counter Russian and Chinese naval advances. There is added urgency given both that China is aggressively posturing itself to obtain maximum advantage over Taiwan and that many of the U.S. Navy’s efforts to improve itself will take several years to achieve the desired results.

## 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 2023 ■ 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></p> <p>Inventory: <b>10</b><br/>Fleet age: <b>32.3</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 with a single midlife refueling. Retirement of the class will begin in FY 2026 with CVN-68 USS <i>Nimitz</i>, followed in FY 2027 by CVN-69 USS <i>Eisenhower</i>, with the class to be replaced by <i>Ford</i>-class carriers.</p> | 2         | 3                | <p><b><i>Ford-Class Aircraft Carrier (CVN-78)</i></b></p> <p>Timeline: <b>2017-TBD</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 a 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. The ship completed Planned Incremental Availability on March 1 after six months of modernization and maintenance. The ship began its first deployment in fall 2022, and its intended life expectancy is 50 years.</p> | 2          | 3            |
| <p><b><i>Ford-Class Aircraft Carrier (CVN-78)</i></b></p> <p>Inventory: <b>1</b><br/>Fleet age: <b>5.9</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. CVN-78 deployed in the fall of 2022 after five years of delays. Delivery of CVN-79 is expected in July of 2025, and while CVN-80 and CVN-81 are under construction.</p>  | 5         | 5                | <p><b>PROCUREMENT</b></p> <p>3 1</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$4,746 \$2,120</p>  |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES

1 2 3 4 5  
Weakest ← → Strongest

Procurement and Spending ■ Through FY 2023 ■ 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></p> <p>Inventory: <b>17</b><br/>Fleet age: <b>33.5</b> Date: <b>1981</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 strikes, anti-surface warfare, and anti-submarine warfare, its primary focus is air and missile defense. The cruisers have a life expectancy of 40 years. The Navy plans to retire the entire cruiser fleet by FY 2027.</p>   | 2         | 3                | <p><b><i>Zumwalt-Class Destroyer (DDG-1000)</i></b></p> <p>Timeline: <b>2016–2026</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 that is designed 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 has been reduced to three. The first DDG-1000 was commissioned in October 2016. Delivery of DDG-1002, the last ship of the class, is expected in 2024.</p> | 1          | 2            |
| <p><b><i>Zumwalt-Class Destroyer (DDG-1000)</i></b></p> <p>Inventory: <b>1</b><br/>Fleet age: <b>5.6</b> Date: <b>2016</b></p> <p>The <i>Zumwalt</i>-class is a 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, and DDG 1002 is currently awaiting Combat Systems testing before entering the service.</p> | 5         | 3                | <p><b>PROCUREMENT</b></p> <p>3</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$4,092</p>  |            |              |
| <p><b><i>Arleigh Burke-Class Destroyer (DDG-51)</i></b></p> <p>Inventory: <b>73</b><br/>Fleet age: <b>19.5</b> Date: <b>1991</b></p> <p>The <i>Arleigh Burke</i>-class is a multi-mission guided missile destroyer that features the Aegis Weapons System and has air defense as its primary mission. The Navy procured three in FY 2023 and will continue to procure two each fiscal year. The destroyers will begin to decommission starting in FY 2031 with DDG-51.</p>  | 3         | 4                | <p><b><i>Arleigh Burke-Class Destroyer (DDG-51)</i></b></p> <p>Timeline: <b>1991–2034</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 be the Flight III design, which includes the more capable Advanced Missile Defense Radar (AMDR). The Navy procured three destroyers in FY 2023 and plans to procure two each fiscal year. The destroyers are believed to have an estimated service life of 40 years.</p>   | 2          | 4            |
|   |           |                  | <p><b>PROCUREMENT</b></p> <p>92 12</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$102,420 \$102,524</p>  |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023  
■ Pending

## Small Surface Combatant

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|--|-----------|------------------|--|------------|--------------|
| <p><b>Littoral Combat Ship (LCS)</b></p> <p>Inventory: <b>27</b><br/>Fleet age: <b>4.3</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. However, the FY 2023 defense authorization bill authorized the early retirement of four LCS vessels.</p>   | 5         | 3                | <p><b>Littoral Combat Ship (LCS)</b></p> <p>Timeline: <b>1991-2024</b></p> <p>The LCS is intended to fulfill the mine countermeasure, antisubmarine warfare, and surface warfare roles for the Navy. It is designed to operate in near-shore environments but is also capable of open-ocean operation. It works better with smaller ships than the DDG-51. The FY 2023 National Defense Authorization Act approved the early retirement of four <i>Freedom</i>-class ships. The <i>Independence</i>-class LCS would remain as the sole small surface combatant after the retirement of the MCM ships and until the new FFG-62 frigates are delivered. The decision to scrap the <i>Freedom</i>-class LCS does not affect the ships currently under construction.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>33 \$16,182</p>  | 2          | 3            |
| <p><b>Avenger-Class Mine Counter Measure (MCM-1)</b></p> <p>Inventory: <b>8</b><br/>Fleet age: <b>30.8</b> Date: <b>1983</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> | 1         | 2                | <p><b>Constellation-Class Frigate</b></p> <p>Timeline: <b>1991-2034</b></p> <p>A new program called the FFG-62 will augment the LCS program to fill out the remaining 20-ship small surface combatant requirement for a total of 52 small surface combatants. The ships will be 496 feet in length with a top speed of 29 miles per hour and a range of 6,000 nautical miles. Its purpose is to escort carrier battle groups and high-value convoys. It will accommodate 32 VLS cells to handle high-powered missiles and machine guns. The first ship should be delivered by 2026 and be operational by 2030. The current contract would provide 10 hulls by 2030 with a total of 20 FFG-62 frigates in the fleet. Procurement has been one frigate per fiscal year with the Navy requesting to procure one more in FY 2023.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>4 16 \$4,560 \$16,855</p> | N/A        | N/A          |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## SSGN Cruise Missile Submarine

| PLATFORM  | Age Score | Capability Score | MODERNIZATION PROGRAM | Size Score | Health Score |
|---|-----------|------------------|-----------------------|------------|--------------|
| <p><b>Ohio-Class (SSGN-726)</b></p> <p>Inventory: <b>4</b><br/>Fleet age: <b>40.4</b> Date: <b>1981</b></p> <p>The SSGNs provide the Navy with a large stealthy strike and special operations mission capabilities. From 2002–2007, the four oldest <i>Ohio</i>-class ballistic missile submarines were converted to guided missile submarines. Each SSGN can carry 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 FY2028. The Navy tentatively plans to replace the SSGNs with a new Large Payload Submarine beginning in FY 2036, but loss of the SSGN undersea strike capability will be mitigated by the <i>Virginia</i>-class Payload Module (VPM). The <i>Ohio</i>-class had a planned service life of 42 years, but this may be extended.</p> | 1         | 4                | None                  |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES



Procurement and Spending ■ Through FY 2023 ■ 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>22.9</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. The Navy planned to build 29 submarines, but the program was cut to three. 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>   | 2         | 4                | <p><b>Virginia-Class (SSN-774)</b><br/>Timeline: <b>2004–2036</b></p> <p>The <i>Virginia</i>-class is in production and will replace the <i>Los Angeles</i>-class and <i>Seawolf</i>-class fast attack submarines as they are decommissioned. 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. The <i>Virginia</i>-class's planned service is 33 years, and 38 have been procured so far at a rate of two per year. A Government Accountability Office audit found that Block V boats are taking, on average, two years longer to complete.</p> | 2          | 3            |
| <p><b>Los Angeles-Class (SSN-688)</b><br/>Inventory: <b>25</b><br/>Fleet age: <b>31</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. Between 2022 and 2028, 14 <i>Los Angeles</i>-class submarines will be retired and replaced by the <i>Virginia</i>-class.</p>   | 1         | 3                | <p><b>PROCUREMENT</b></p> <p>38 13</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$69,938 \$41,331</p>  |            |              |
| <p><b>Virginia-Class (SSN-774)</b><br/>Inventory: <b>21</b><br/>Fleet age: <b>9.1</b> Date: <b>2004</b></p> <p>The <i>Virginia</i>-class is the U.S. Navy's next-generation attack submarine and includes several improvements over previous attack submarine classes that provide increased acoustic stealth, improved SOF support, greater strike payload capacity, and reduced operating costs. With a planned service life of 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. Thirty-eight have been procured so far at a rate of two per year.</p> | 4         | 4                |   |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ 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>32.5</b> Date: <b>1981</b></p> <p>The <i>Ohio</i>-class SSBN is the most survivable leg of the U.S. military's strategic nuclear triad. Its sole mission is strategic nuclear deterrence, for which it carries long-range submarine-launched ballistic missiles, and its expected service life is 42 years. Retirement of the <i>Ohio</i>-class fleet will begin in 2027 at an estimated rate of one submarine per year until 2039. The <i>Ohio</i>-class fleet will be replaced by 12 <i>Columbia</i>-class SSBNs.</p> | 1         | 4                | <p><b>Columbia-Class (SSBN-826)</b></p> <p>Timeline: <b>2021-TBD</b></p> <p>The 12-boat <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 2024 budget submission estimates the 12 boats' total procurement cost at \$112.7 billion. The lead boat, SSBN-826, is expected to be delivered in FY 2027, and its first patrol is scheduled for FY 2031. Due to complications from the pandemic and technical challenges, the program risks being delayed. Despite such issues, construction continues. The <i>Columbia</i>-class will have a 42-year life expectancy.</p> |                                      |              |
|   |           |                  | <p><b>PROCUREMENT</b></p>  | <p><b>SPENDING (\$ millions)</b></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>7</b><br/>Fleet age: <b>26.3</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>                                | 2         | 3                | <p><b>America-Class (LHA-6)</b></p> <p>Timeline: <b>2014-2033</b></p> <p>LHA Flight 0 (vessels LHA-6 and 7) was designed without a well deck to provide more space for Marine Corps 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, and three LHA 6s have already been procured. Construction of LHA-9 is underway.</p> | 3                                    | 3            |
| <p><b>America-Class Amphibious Assault Ship (LHA-6)</b></p> <p>Inventory: <b>2</b><br/>Fleet age: <b>5.8</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. Construction of USS <i>Fallujah</i> (LHA 9) is underway.</p> | 5         | 4                | <p><b>PROCUREMENT</b></p>  | <p><b>SPENDING (\$ millions)</b></p> |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Amphibious Warfare Ship (Cont.)

| 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>12</b><br/>Fleet age: <b>10.9</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. Eleven 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. As of FY 2023, three of the LPD Flight II-class have been procured.</p>   | 4         | 3                | <p><b>San Antonio-Class Amphibious Transport Dock (LPD-17)</b></p> <p>Timeline: <b>2006-2024</b></p> <p>The 13 LPD-17s are replacements for the San Antonio-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> <b>SPENDING (\$ millions)</b></p> <p>13 \$13,836</p>  | 4          | 4            |
| <p><b>Whidbey Island-Class Dock Landing Ship (LSD-41)</b></p> <p>Inventory: <b>6</b><br/>Fleet age: <b>33.4</b> Date: <b>1985</b></p> <p>LSD-41 <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. LSD-41-class will be replaced by the LPD-17 Flight II program, which began procurement in FY 2018. The Navy plans to retire six of the <i>Whidbey Island</i>-class ships before 2026.</p> | 2         |                  | <p><b>LPD-17 Flight II</b></p> <p>Timeline: <b>2025-2029</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, but 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. In its FY 2024 budget submission, the Navy proposed truncating the program by making LPD-32 the final ship.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>3 \$4,599</p> | 3          | 4            |
| <p><b>Harpers Ferry-Class Dock Landing Ships (LSD-49)</b></p> <p>Inventory: <b>4</b><br/>Fleet age: <b>27.1</b> Date: <b>1995</b></p> <p>The <i>Harpers Ferry</i>-class, which reduced LCAC capacity to two while increasing cargo capacity, 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. The Navy plans to retire four of the <i>Harpers Ferry</i>-class ships before 2026.</p>  | 2         |                  |  |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.



# NAVY SCORES

1 2 3 4 5  
Weakest ← → Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Airborne Early Warning

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>E-2C Hawkeye</b></p> <p>Inventory: <b>20</b><br/>Fleet age: <b>40</b> Date: <b>1973</b></p> <p>The E-2C Hawkeye is a battle management and airborne early warning aircraft that uses computerized radar and electronic surveillance sensors for threat analysis and early warning. The E-2C fleet received a series of upgrades to mechanical and computer systems around the year 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></p> <p>Timeline: <b>2014-2023</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 of 24 aircraft beginning in FY 2019 to complete the program of record. An additional five aircraft were requested for procurement in FY 2023.</p> | 4          | 4            |
| <p><b>E-2D Advanced Hawkeye</b></p> <p>Inventory: <b>54</b><br/>Fleet age: <b>4.5</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. The E-2D AHE is a replacement for the E-2C platform. As of FY 2023, 119 E-2D AHE had been procured, and an additional six aircraft are requested for future procurement.</p> | 5         | 4                | <p><b>PROCUREMENT</b></p> <p>119 6</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$15,775 \$1,961</p>   |            |              |

## Electronic Attack Aircraft

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>EA-18G Growler</b></p> <p>Inventory: <b>158</b><br/>Fleet age: <b>10</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 and fulfilling the Navy's requirement. It replaced the legacy EA-6B Prowlers. The Navy proposed to retire 25 EA-18Gs across five land-based expeditionary electronic attack squadrons in its FY 2023 budget request, but the FY 2023 National Defense Authorization Act (NDAA) prevented retirement of the aircraft.</p> | 5         | 4                | None                |            |              |

**NOTE:** See page 468 for details on fleet ages, dates, timelines, and procurement spending.

# NAVY SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ 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>613</b><br/>Fleet age: <b>19</b> Date: <b>2001</b></p> <p>The F/A-18 E/F Super Hornet has longer range, greater weapons payload, and more 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. As of FY 2022, 690 F/A-18 E/F Super Hornets had been procured.</p> | 3         | 3                | <p><b>F-35C Joint Strike Fighter</b></p> <p>Timeline: <b>2019-2034</b></p> <p>The F-35C is the Navy's variant of the Joint Strike Fighter. The Joint Strike Fighter faced many issues during its developmental stages, including engine problems, software development delays, cost overruns incurring a Nunn-McCurdy breach, and structural problems. The Navy declared initial operational capability (IOC) of the F-35C in February 2019. The planned procurement of 273 F-35Cs will replace over 500 Super Hornets. As of FY 2023, 174 of the aircraft had been procured with an additional 19 requested for procurement in FY 2024.</p> | 2          | 3            |
| <p><b>F-35C Joint Strike Fighter</b></p> <p>Inventory: <b>52</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 including air-to-air combat, air-to-ground strikes, and ISR missions. As of FY 2023, 177 F-35C airframes had been procured, and procurement of an additional 192 is expected to begin in FY 2024.</p>  | 5         | 4                | <p><b>PROCUREMENT</b></p> <p>177 192</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$27,122 \$26,407</p>   |            |              |

**NOTES:** See Methodology for descriptions of scores. Fleet age is the average 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 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.

# U.S. Navy Modernization Table Citations

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# U.S. Air Force

John Venable

The mission of the U.S. Air Force has expanded significantly since 1947 when the USAF became a separate service. Initially, operations were divided among four major components—Strategic Air Command, Tactical Air Command, Air Defense Command, and Military Air Transport Service—that collectively reflected the Air Force’s “fly, fight, and win” nature. Space’s rise to prominence in the early 1950s brought with it a host of capabilities that would expand the service’s portfolio and increase its capabilities in the mission areas of intelligence, surveillance, and reconnaissance (ISR) and command and control (C2).

With the birth of the Space Force in December 2019,<sup>1</sup> the Air Force began to move its space and space-related personnel assets to the new service. The impact of that change, coupled with the lingering effects of the global COVID-19 pandemic that were highlighted in the *2022 Index of Military Strength*,<sup>2</sup> continue to hamper the trajectory of the Air Force.

The creation of the Space Force affected three Air Force mission areas: air and space superiority, ISR, and C2. Each of these mission areas was born from air-breathing assets, and while the loss of the space portfolio has reduced the service’s inherent capabilities, they remain within the Department of the Air Force (DAF) and should allow the Air Force to focus the weight of its efforts on core missions in the air and cyber domains.

Today’s Air Force has five principal missions:

- Air superiority (space superiority is now the responsibility of the Space Force);
- Intelligence, surveillance, and reconnaissance;

- Mobility and lift;
- Global strike; and
- Command and control.

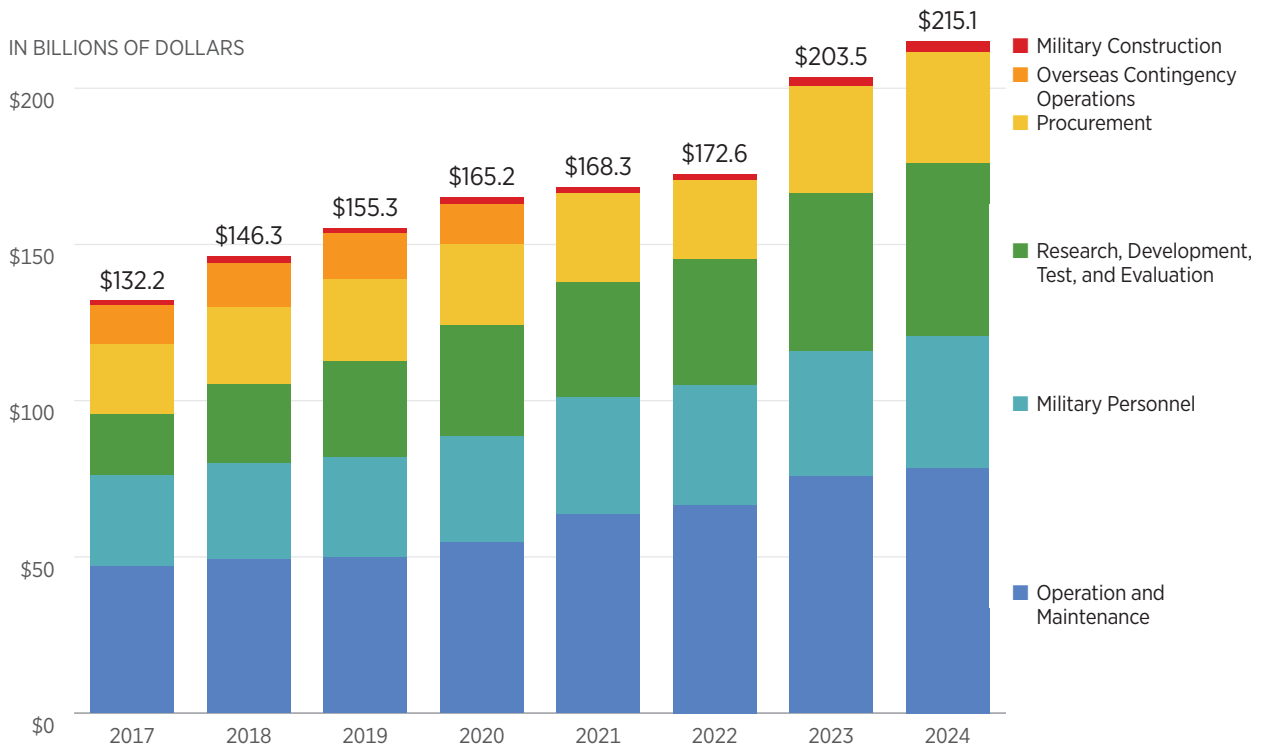
Unlike some of the other services, the Air Force did not grow larger during the post-9/11 buildup. Instead, it grew smaller as acquisitions of new aircraft failed to offset programmed retirements of older aircraft. Following the sequestration debacle in 2012, the Air Force began to trade size for quality.<sup>3</sup> It was forced to make strategic trades in capacity, capability, and readiness to meet the operational demands of the war on terrorism and develop the force it needed for the future. The collective effects left the Air Force of 2016 with just 55 total force fighter squadrons (the aggregate of Active and Reserve Component squadrons), and the readiness levels within those organizations were very low. Only four of the Air Force’s 32 active-duty fighter squadrons were ready for conflict with a near-peer competitor, and only 14 others were considered ready even for low-threat combat operations.<sup>4</sup>

Recognizing the threat from a rising China and resurgent Russia, the 2018 National Defense Strategy (NDS) directed the services to prepare for a large-scale, high-intensity conventional conflict with a peer adversary.<sup>5</sup> Later that same year, the Air Force released “The Air Force We Need” (TAFWN), a study of the capacity it would need to fight and help the U.S. win such a war. Based on thousands of war-game simulations, TAFWN found that to execute that strategy, the service needed to grow by 25 percent, from 312 to 386 squadrons. This growth included one additional airlift squadron and seven additional fighter, five additional bomber, and 14

CHART 15

## Air Force Budgets, 2017–2024

IN BILLIONS OF DOLLARS



**SOURCES:** Extracted from U.S. Air Force budget summaries for FY 2013–FY 2023. For example: U.S. Department of the Air Force, *United States Air Force FY 2013 Budget Overview*, February 2012, p. 12, <https://www.saffm.hq.af.mil/Portals/84/documents/FY13/AFD-120209-052.pdf?ver=2016-08-24-090344-023> (accessed September 19, 2023); U.S. Department of the Air Force, *Department of the Air Force FY 2023 Budget Overview*, p. 3, [https://www.saffm.hq.af.mil/Portals/84/documents/FY23/SUPPORT/\\_BOB\\_28Mar\\_1125\\_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d](https://www.saffm.hq.af.mil/Portals/84/documents/FY23/SUPPORT/_BOB_28Mar_1125_LoRes.pdf?ver=5nrA8bBfhWoUSrvZ09CeHA%3d%3d) (accessed September 19, 2023); and Table 1, “Department of the Air Force Budget Summary,” in U.S. Department of the Air Force, *FY 2024 Department of the Air Force Budget Overview*, p. 2, [https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB\\_YsIGx1wx4IA%3d%3d](https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB_YsIGx1wx4IA%3d%3d) (accessed September 19, 2023).

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additional tanker squadrons,<sup>6</sup> which equates to an additional 182 fighter, 50 bomber, 210 air refueling, and 15 airlift platforms.<sup>7</sup>

During the same period, the service’s most senior leaders emphasized the need for more time in the air for aircrews. Secretary of the Air Force Heather Wilson, for example, “noted that even when air crews go abroad and fly combat missions, such as those against violent extremists such as the Islamic State, they’re not practicing skills that would be required for a high-end fight against an advanced adversary such as Russia.”<sup>8</sup> Those demands required a bigger budget, and from 2017 through 2021, the

Trump Administration increased DAF funding by 31 percent.<sup>9</sup>

With the shortfall in aircraft and flying hours, the DAF could have used the surge in funding to support significant increases in Air Force capacity, capability, and readiness, but the service chose instead to use much of the additional funding for research, development, test, and evaluation (RDT&E). In 2023 dollars, the DAF budget for RDT&E went from \$19.6 billion in fiscal year (FY) 2017 to \$55.4 billion in the Administration’s FY 2024 budget, an increase of 226 percent. During that same period, the department’s budget for aircraft procurement

increased from \$18.9 billion to \$20.3 billion, an increase of just 8 percent.<sup>10</sup>

Funding for flying hours has continued to decline. In FY 2013, the year sequestration decimated the Department of Defense (DOD) budget, the Air Force programmed (budgeted) 1.53 million flying hours across all platforms. Overseas contingency operations added another 0.512 million hours, which meant that Air Force aircraft flew 2.04 million hours.<sup>11</sup> In FY 2022, the Air Force budgeted for 1.12 million hours, 27 percent less than the number of hours it flew in 2013, and fell short of executing even that low number by 23,000 hours because of cost fluctuations.<sup>12</sup>

In April 2022, in spite of TAFWN's finding that the Air Force was 25 percent too small for its mission sets, it was revealed that the Air Force was planning to cut 1,468 aircraft from its fleet over the Future Years Defense Program (FYDP), including the accelerated retirement of 646 F-15C, F16C, and A-10 fighter aircraft, and that it planned to procure just 246 aircraft over that period.<sup>13</sup> In July 2023, the Air Force announced that it would add 103 F-15Es to the roster of retirements.<sup>14</sup> This means that a total of 500 of its current fleet of 2,092 fighters will be lost, reducing the fleet by almost 25 percent over the course of the next five years.

## Capacity

At the height of the Cold War buildup in 1987, the active-duty Air Force had an inventory of 3,082 fighter, 331 bomber, 576 air refueling, and 331 strategic airlift platforms. When the strategic reserve assets within the Air National Guard and Air Force Reserve are added, the 1987 totals were 4,468 fighter, 331 bomber, 704 air refueling, and 362 strategic airlift platforms. After the fall of the Iron Curtain, the United States shifted from a force-sizing construct centered on great-power competition to one capable of winning two simultaneous or nearly simultaneous major regional conflicts (MRCs). Those numbers for capacity have been reduced significantly over the years.

It is projected that at the end of FY 2023, the Air Force will have a total aircraft inventory (TAI) of 2,092 fighters, 141 bombers, 471 tankers, and 274 strategic airlift platforms. With the rollout of the President's budget for FY 2024, the service announced its plan to eliminate 60 fighters and nine bombers from its inventory, which will bring

its total force TAI to 1,932 fighters, 140 bombers, 471 tankers, and 274 strategic airlift platforms.<sup>15</sup> At that point, the Air Force will have a total force that equates to 47 percent of the fighter, 43 percent of the bomber, 67 percent of the tanker, and 76 percent of the airlift assets it possessed the last time the United States was prepared to fight a peer competitor.

The idea that aircraft production lines will somehow surge to come to the rescue in a peer-level crisis might seem plausible to some,<sup>16</sup> but even if Congress were to throw an unlimited amount of funding at production lines, it would take from two to three years for those additional assets to arrive.<sup>17</sup>

The *Index of U.S. Military Strength* uses "combat-coded" fighter aircraft within the Active Component of the U.S. Air Force to assess capacity. Combat-coded aircraft and related squadrons are aircraft and units with an assigned wartime mission, which means that those numbers exclude units and aircraft that are assigned to training, operational test and evaluation (OT&E), and other missions.

The software and munitions carriage and delivery capability of aircraft in units that are not combat-coded renders them incompatible with and/or less survivable than combat-coded versions of the same aircraft. For example, all F-35As may appear to be ready for combat, but training wings and test and evaluation jets have hardware and software limitations that would severely curtail their utility and effectiveness in combat. Even if those jets were slated for upgrades, hardware updates sideline jets for several months, and training wings and certain test organizations are generally the last to receive those upgrades.

Of the 5,154 manned and unmanned aircraft projected to be in the USAF's inventory at the end of FY 2023, 1,432 are active-duty fighters, and 886 of those are combat-coded aircraft.<sup>18</sup> It is important to separate the active-duty fighters and units from the strategic reserve because it would take several months to get elements of the latter up to manning and readiness levels that allowed their first elements to deploy. Unfortunately, other factors also affect the number of fighters the service could actually employ in combat.

Most squadrons will have to pack up and deploy several thousand miles to be able to fight. Because of the additional wartime manning requirements and the fact that most squadrons have several jets

that need repairs at any given time, it takes the resources of approximately three active-duty squadrons to deploy two combat-capable fighter units forward.<sup>19</sup> That effectively reduces the total number of active-duty, combat-coded fighters to 571 jets.

The Air Reserve Component has 608 fighters, approximately 458 of which are combat coded. Because of the additional wartime manning requirements and the fact that Guard and Reserve units generally have just one squadron at each location, it takes two squadrons to deploy one combat-capable unit forward.<sup>20</sup> In terms of capacity, this means that 626 active-duty and 229 strategic reserve fighters, for a total of 885 combat-coded fighters, could be deployed into combat, leaving virtually nothing in reserve. However, recent squadron deployments in response to a request from the Commander of U.S. European Command following Russia's invasion of Ukraine were fulfilled with 12 jets—packages that were referred to as “squadrons,” implying that the Air Force has reduced the number of fighter aircraft normally associated with the term “squadron” from 24 to 12.

Capacity also relies on the stockpile of available munitions and the production capacity of the munitions industry. The actual number of munitions within the U.S. stockpile is classified, but there are indicators that make it possible to assess the overall health of this vital area. The inventory for precision-guided munitions (PGM) was severely stressed by nearly 18 years of sustained combat operations in Iraq, Afghanistan, Syria, and elsewhere and by budget actions that limited the service's ability to procure replacements and increase stockpiles. From 2017 through 2021, funding for munitions was significant, and the service, believing the inventory is now sufficiently restocked, has reduced the number of PGMs it will acquire to a total of 9,486 munitions in FY 2024.<sup>21</sup>

However, even though the munitions stockpile may have returned to a level that is high enough to support a surge in expenditures associated with a conflict similar to the global war on terrorism—loosely encompassing operations in Afghanistan and Iraq—it probably would not support a peer-level fight that lasted more than a few weeks. Typically, there is a delay of 24–36 months between funding and delivery of additional munitions, and while the potential exists for a rapid expansion of production, it is hard to envision how such an expansion could

be rapid enough to exceed demand before the stockpile is depleted. (See Table 11.)

Advances in the jamming of global navigation satellite systems (GNSS) like GPS have been significant over the past 20 years, and the number, types, and effectiveness of jammers are growing.<sup>22</sup> In the days leading up to its invasion of Ukraine in February 2022 and throughout its combat operations since then, Russia has used its systems to jam signals in the region to hamper the employment of Ukrainian and Allied GNSS guided weapons systems against its troops and equipment, and the areas covered by the effects of those systems can be considerable.<sup>23</sup> The employment of such systems in a war with a peer adversary could significantly diminish the accuracy of weapons like Joint Direct Attack Munitions (JDAMs) and Small Diameter Bombs (SDBs) that rely on reliable Global Positioning System (GPS) guidance to hit their targets.

Although there has been significant research focused on making munitions less susceptible to the effects of GPS jammers, there is little evidence that such munitions would retain their accuracy during a full-up conflict with a peer adversary. Attacking targets in that environment using GPS guidance alone might require many more munitions and sorties than would otherwise be necessary, depleting the inventory of GPS guided munitions much faster and with markedly less effect than is likely contemplated by current war plans.

The only weapons in the U.S. inventory that can fully counter GPS/electronic jammers and reliably hit their targets are those that can track physical targets with laser, optical, or infrared seeker heads. The Air Force has not acquired PaveWay or Maverick missiles for several years, and most GPS guided munitions do not have seeker heads or a secondary capability to track and guide on a target in a degraded GPS environment.

To cover this gap, the Air Force has added a laser guidance capability to its already effective GBU-53 Small Diameter Bomb (SDB I). Known as the SDB II, the improved weapon “uses Link 16 and ultra-high frequency datalinks, along with infrared guidance, to provide course corrections” and hit “both fixed and moving targets.”<sup>24</sup> Unfortunately, the service has not yet acquired the SDB II in numbers that would be required for conflict with a peer competitor.

TABLE 11

## Precision-Guided Munitions Expenditures and Programmed Acquisitions

### TOTAL MUNITIONS EXPENDED

|              | FY 2017       | FY 2018      | FY 2019       | FY 2020       | FY 2021       | FY 2022      | FY 2023*      |
|--------------|---------------|--------------|---------------|---------------|---------------|--------------|---------------|
| JDAM         | 30,664        | 5,462        | 7,354         | 4,004         | 4,242         | 4,203        | 4,250         |
| HELLFIRE     | 1,536         | 2,110        | 2,449         | 1,019         | 1,023         | 132          | 110           |
| SDB-I/II     | 4,507         | 749          | 1,289         | 397           | 98            | 52           | 355           |
| APKWS        | Unknown       | Unknown      | Unknown       | Unknown       | Unknown       | Unknown      | 866           |
| JASSM ER/XR  | 360           | 19           | 16            | 10            | 8             | 0            | 12            |
| LGB          | 276           | 373          | 106           | 6,078         | 5,625         | 4,856        | 5,265         |
| ARRW         | 0             | 0            | 0             | 0             | 0             | 2            | 0             |
| LRASM        | 0             | 0            | 0             | 0             | 0             | 0            | 0             |
| <b>Total</b> | <b>38,092</b> | <b>9,462</b> | <b>11,963</b> | <b>11,508</b> | <b>10,996</b> | <b>9,245</b> | <b>10,858</b> |

### TOTAL MUNITIONS ACQUIRED

|              | FY 2018       | FY 2019       | FY 2020       | FY 2021       | FY 2022       | FY 2023       | FY 2024**    |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| JDAM         | 35,106        | 36,000        | 25,000        | 16,800        | 1,919         | 1,241         | 2,840        |
| HELLFIRE     | 3,629         | 3,734         | 3,859         | 4,517         | 1,176         | 5,151         | 1,295        |
| SDB-I/II     | 7,312         | 6,254         | 8,253         | 3,205         | 1,983         | 5,837         |              |
| APKWS        | 10,621        | 6,879         | 15,642        | 1,323         | 12,801        | 11,199        | 4,911        |
| JASSM ER     | 360           | 360           | 390           | 400           | 525           | 390           | 440          |
| LGB          | 0             | 0             | 0             | 0             | 0             | 0             | 0            |
| ARRW         | 0             | 0             | 0             | 0             | 12            | 0             | 0            |
| LRASM        |               |               |               |               |               | 28            | 6            |
| <b>Total</b> | <b>57,777</b> | <b>53,976</b> | <b>53,893</b> | <b>26,994</b> | <b>18,416</b> | <b>23,818</b> | <b>9,486</b> |

\* Estimates based on programmed expenditures.

\*\* Estimates based on FY 2024 President's Budget.

#### SOURCES:

- Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 24, 2023.
- Table 1, "Department of the Air Force Budget Summary," in U.S. Department of the Air Force, *Department of the Air Force FY 2024 Budget Overview*, p. 2, [https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB\\_YsIGx1wx4IA%3d%3d](https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB_YsIGx1wx4IA%3d%3d) (accessed September 18, 2023).
- U.S. Department of the Air Force, *Department of Defense Fiscal Year (FY) 2024 Budget Estimates, Air Force, Justification Book Volume 1 of 1, Procurement of Ammunition, Air Force*, March 2023, pp. 5 and 41, [https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Procurement/FY24%20Air%20Force%20Ammunition%20Procurement.pdf?ver=EP4kq6Ly9fXnB\\_sF66NVMA%3D%3D](https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Procurement/FY24%20Air%20Force%20Ammunition%20Procurement.pdf?ver=EP4kq6Ly9fXnB_sF66NVMA%3D%3D) (accessed September 18, 2023).

## Capability

The risk assumed in capacity has placed an ever-growing burden on the capability of Air Force assets. The ensuing capability-over-capacity strategy centers on the idea of developing and maintaining a *more* capable force that can win against the advanced fighters and surface-to-air missile systems now being developed by top-tier potential adversaries like China and Russia, which are also increasing their capacity in this area.

Any assessment of capability includes both the incorporation of advanced technologies and the overall health of the inventory. Most aircraft have programmed life spans of 20 to 30 years based on a programmed level of annual flying hours. The bending and flexing of airframes over time in the air generates predictable levels of stress and fatigue on everything from metal airframe structures to electrical wiring harnesses.

The average age of Air Force aircraft is more than 30 years, and in some fleets, such as the B-52 bomber, it is more than 62 years. In addition, KC-235s comprise 76 percent of the Air Force's 471 tankers and are more than 61 years old on average. By the end of FY 2024, 102 brand-new KC-46s will make up 21 percent of the tanker inventory, but they will not currently be capable of refueling aircraft during combat operations—the jet's primary mission.<sup>25</sup>

The Air Force estimates that the fix for problems in the KC-46's refueling boom and remote vision system (RVS) should be ready by the spring of 2024. Assuming the boom and RVS redesign goes as planned, retrofitting jets that the service has already accepted will take several years, and the operational impact of that process will be significant: 103 strategic air refueling assets will be unusable in real-world operations in 2024. That number will grow to 110 jets in 2025, equating to 23 percent of the fleet that will be unable to fulfill operational taskings reliably.<sup>26</sup>

The average age of the F-15C fleet is 39 years,<sup>27</sup> significantly exceeding the programmed service life of a fleet that still comprises more than half of USAF air superiority platforms.<sup>28</sup> The F-16C fleet is more than 33 years old,<sup>29</sup> and to extend their lives even further, 300 of those jets are undergoing a major service life extension program (SLEP) that will allow them to fly through 2050.<sup>30</sup> These modifications are costly, and the added expense reduces the amount of funding the service has to invest in

modernization, which is critical to ensuring future capability. Even with a SLEP, there is a direct correlation between aircraft age and the maintainability of those platforms. (See Table 12.)

The Air Force's ISR and lift capabilities face similar problems in specific areas that affect both capability and capacity. The majority of the Air Force's ISR aircraft are now unmanned aerial vehicles (UAVs). The Air Force will divest 38 MQ-9 Block-1 aircraft in FY 2024, leaving a total of 208 Reapers.<sup>31</sup> The service divested the last of its fleet of EQ-4s and Block 30 RQ-4s in FY 2021 and FY 2022, respectively. The RQ-4 Block 40 fleet remains in service, and the RQ-4 Block 30 mission will be carried on by the 40-year-old U-2, which is scheduled to be divested by the end of the current FYDP.<sup>32</sup>

The E-8 Joint Surveillance Target Attack Radar System (J-STARS) and RC-135 Rivet Joint are ISR platforms built on the Boeing 707 airframe, and the last one came off the production line 44 years ago. The Air Force will divest its last three remaining E-8s in FY 2024.<sup>33</sup>

The Air Force is working on an incremental approach for a J-STARS replacement that focuses on advanced and disaggregated sensors (a system of systems) that would require enhanced and hardened communications links. Known as the Advanced Battle Management System (ABMS), it is envisioned as an all-encompassing approach to both airborne and ground Battle Management Command and Control (BMC2) that would allow the Air Force both to fight and to support joint and coalition partners in high-end engagements.<sup>34</sup>

With respect to air combat, the Air Force will retire 57 more F-15C/Ds in FY 2024, leaving just 92 in its inventory.<sup>35</sup> Concerns about what platform will fill this role when the F-15C is retired are fully justified. Just 186 of 750 planned F-22A stealth air superiority fighters were acquired to replace the F-15C,<sup>36</sup> and the service has announced its intent to retire 33 Block 20 F-22s in FY 2024. If those jets are retired,<sup>37</sup> the fleet will be reduced to just 153 jets.<sup>38</sup>

The service's already low ability to fulfill operational requirements for air superiority fighters will be further strained by a 10-year program, intended to refurbish the low-observable coatings on the F-22's engine inlets and inspect and overhaul the aircraft's flight control system, that will run through 2031.<sup>39</sup> That program, which will take aircraft that are to be refurbished out of operational availability,

TABLE 12

## Air Force, Total Aircraft Inventory (Page 1 of 2)

|        | FY 2023     |                    |                   |       |             | FY 2024 |       |       | Mission-Capable Rate |              |                | Average Mission-Capable FY 2023 |
|--------|-------------|--------------------|-------------------|-------|-------------|---------|-------|-------|----------------------|--------------|----------------|---------------------------------|
|        | Active Duty | Air National Guard | Air Force Reserve | Total | Average Age | Retired | Added | Total | FY 2022 Rate         | FY 2021 Rate | Change in Rate |                                 |
| A010C  | 131         | 74                 | 55                | 260   | 41          | -21     |       | 239   | 70%                  | 73%          | -3%            | 167                             |
| AC130J | 30          | 0                  | 0                 | 30    | 4           |         | 0     | 30    | 81%                  | 84%          | -3%            | 24                              |
| B-1B   | 45          | 0                  | 0                 | 45    | 36          | -1      |       | 44    | 64%                  | 41%          | 24%            | 28                              |
| B-2A   | 20          | 0                  | 0                 | 20    | 28          |         |       | 20    | 53%                  | 59%          | -6%            | 11                              |
| B-52H  | 58          | 0                  | 18                | 76    | 62          |         |       | 76    | 59%                  | 59%          | 0%             | 45                              |
| C-130H | 0           | 76                 | 42                | 118   | 31          | -2      |       | 116   | 68%                  | 69%          | -1%            | 79                              |
| C-130J | 103         | 40                 | 10                | 153   | 13          |         | 2     | 155   | 75%                  | 76%          | -1%            | 116                             |
| C-5M   | 36          |                    | 16                | 52    | 36          |         |       | 52    | 53%                  | 57%          | -5%            | 27                              |
| C-17A  | 146         | 50                 | 26                | 222   | 21          |         |       | 222   | 78%                  | 80%          | -3%            | 172                             |
| CV022B | 52          | 0                  | 0                 | 52    | 10          |         |       | 52    | 52%                  | 51%          | 1%             | 27                              |
| E003G  | 18          | 0                  | 0                 | 18    | 44          | -2      |       | 16    | 64%                  | 61%          | 3%             | 10                              |
| E008C  | 0           | 3                  | 0                 | 3     | 23          | -3      |       | 0     | 49%                  | 62%          | -13%           | 0                               |
| E11    | 6           |                    |                   | 6     | 12          |         | 1     | 7     |                      |              |                |                                 |
| EC130H | 6           | 0                  | 0                 | 6     | 49          | -2      |       | 4     | 69%                  | 67%          | 2%             | 3                               |
| EC130J | 0           | 4                  | 0                 | 4     | 23          | -4      |       | 0     | 67%                  | 64%          | 3%             | 0                               |
| F015C  | 0           | 135                | 0                 | 135   | 39          | -49     |       | 86    | 46%                  | 69%          | -23%           | 40                              |
| F015D  | 0           | 14                 | 0                 | 14    | 39          | -8      |       | 6     | 58%                  | 69%          | -11%           | 3                               |
| F015E  | 218         | 0                  | 0                 | 218   | 31          | 0       |       | 218   | 52%                  | 66%          | -15%           | 112                             |
| F015EX | 8           | 0                  | 0                 | 8     | 0.5         |         | 10    | 18    | 85                   |              | n/a            | 1,530                           |
| F016C  | 408         | 236                | 52                | 696   | 33          | 0       |       | 696   | 71%                  | 72%          | -1%            | 494                             |
| F016D  | 98          | 45                 | 2                 | 145   | 33          | 0       |       | 145   | 69%                  | 69%          | 0%             | 100                             |
| F022A  | 165         | 20                 | 0                 | 185   | 17          | -32     |       | 153   | 57%                  | 51%          | 6%             | 87                              |
| F035A  | 412         | 20                 | 0                 | 432   | 5           |         | 45    | 477   | 65%                  | 69%          | -3%            | 312                             |
| HC130J | 21          | 12                 | 6                 | 39    | 7           |         |       | 39    | 76%                  | 76%          | 0%             | 30                              |

TABLE 12

## Air Force, Total Aircraft Inventory (Page 2 of 2)

|        | FY 2023     |                    |                   |       |             | FY 2024 |       |       | Mission-Capable Rate |              |                |                                 |
|--------|-------------|--------------------|-------------------|-------|-------------|---------|-------|-------|----------------------|--------------|----------------|---------------------------------|
|        | Active Duty | Air National Guard | Air Force Reserve | Total | Average Age | Retired | Added | Total | FY 2022 Rate         | FY 2021 Rate | Change in Rate | Average Mission-Capable FY 2023 |
| HH060G | 26          | 18                 | 16                | 60    | 28          | -37     |       | 23    | 69%                  | 71%          | -2%            | 16                              |
| HH060W | 39          | 0                  | 0                 | 39    | 0.5         |         | 19    | 58    | 61%                  |              |                | 35                              |
| KC010A | 24          | 0                  | 0                 | 24    | 39          | -10     |       | 14    | 80%                  | 79%          | 1%             | 11                              |
| KC046A | 63          | 12                 | 7                 | 82    | 2           |         | 20    | 102   | 70%                  | 71%          | -1%            | 71                              |
| KC135R | 118         | 140                | 62                | 320   | 61          | 0       |       | 320   | 72%                  | 71%          | 1%             | 230                             |
| KC135T | 21          | 24                 | 0                 | 45    | 63          |         |       | 45    | 70%                  | 70%          | 0%             | 32                              |
| LC130H | 0           | 10                 | 0                 | 10    | 38          |         |       | 10    | 55%                  | 43%          | 12%            | 6                               |
| MC130J | 56          | 0                  | 0                 | 56    | 7           |         | 8     | 64    | 79%                  | 79%          | 0%             | 51                              |
| MQ009A | 222         | 24                 | 0                 | 246   | 7           | -38     | 0     | 208   | 90%                  | 90%          | 0%             | 187                             |
| RC135S | 3           | 0                  | 0                 | 3     | 61          |         |       | 3     | 81%                  | 86%          | -5%            | 2                               |
| RC135U | 2           | 0                  | 0                 | 2     | 59          |         |       | 2     | 79%                  | 82%          | -3%            | 2                               |
| RC135V | 8           | 0                  | 0                 | 8     | 59          |         |       | 8     | 70%                  | 73%          | -3%            | 6                               |
| RC135W | 12          | 0                  | 0                 | 12    | 60          | 0       | 0     | 12    | 68%                  | 66%          | 2%             | 8                               |
| RQ-4   | 10          | 0                  | 0                 | 10    | 12          | -1      |       | 9     | 71%                  | 74%          | -3%            | 6                               |
| T001A  | 127         | 0                  | 0                 | 127   | 29          | -52     |       | 75    | 76%                  | 74%          | 2%             | 57                              |
| T006A  | 444         | 0                  | 0                 | 444   | 18          |         |       | 444   | 71%                  | 71%          | 0%             | 315                             |
| T007A  |             |                    |                   | 5     | 2           |         |       | 5     |                      | 71%          |                | 0                               |
| T038A  | 53          | 0                  | 0                 | 53    | 57          |         |       | 53    | 69%                  | 72%          | -3%            | 37                              |
| T038C  | 451         | 0                  | 0                 | 451   | 57          |         |       | 451   | 57%                  | 63%          | -6%            | 257                             |
| U2     | 31          | 0                  | 0                 | 31    | 41          |         |       | 31    | 73%                  | 76%          | -3%            | 23                              |
| Totals |             |                    |                   | 5,154 | 29.51       | -190    |       | 4,964 |                      |              | -1%            |                                 |

**SOURCE:** Appendix, "Total Aircraft Inventory (TAI)," in U.S. Department of the Air Force, *FY 2024 Department of the Air Force Budget Overview*, March 2023, p. 43, [https://www.safirm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=-JFXW89XqB\\_YsIGxIwx4IA%3d%3d](https://www.safirm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=-JFXW89XqB_YsIGxIwx4IA%3d%3d) (accessed September 25, 2023).



coupled with the F-22's low mission capability rate, would significantly hobble the availability of this system in a fight with a peer competitor.

The Air Force continues to acquire the F-35A, and the President's budget for FY 2024 would support acquisition of 48 of these multirole stealth fighters. The jet achieved full operating capability (FOC) in 2018 and flew for the first time with the long-awaited Block 4/Technical Refresh-3 (TR-3) on January 6, 2023.<sup>40</sup> The F-35A's multirole design favors the air-to-ground mission, but its fifth-generation faculties will also be dominant in an air-to-air role, allowing it to augment the F-22A in many scenarios.<sup>41</sup>

The F-35A is programmed to receive \$5.8 billion in funding over the FYDP. At that level, it is eighth on the DAF funding priorities list, preceded by Next Generation Air Dominance (NGAD) at \$22.06 billion; the Ground Based Strategic Deterrent (GBSD) at \$14.9 billion; the B-21 at \$10.6 billion; Resilient Missile Warning Missile Tracking-Low Earth Orbit at \$9.7 billion; Space Technology Development and Prototyping at \$9.3 billion; the Survivable Airborne Operations Center at \$8.1 billion; and Evolved Strategic Satellite Communications (SATCOM) at \$6.8 billion. In other words, the only fifth-generation U.S. fighter in production has a significantly lower priority than strategic bomber, satellite, and F-22 air dominance replacement programs even though the Air Force is substantially short of the combat-coded aircraft that would be needed to win a war against any peer or near-peer opponent.

NGAD is not expected to begin fielding until 2030 at the earliest, and while the B-21 has yet to fly, the program has completed an Integrated Baseline Review for the overall B-21 development effort as well as the jet's Preliminary Design Review. The Air Force is committed to a minimum of 100 B-21s at an average cost of \$639 million per plane in FY 2019 dollars.<sup>42</sup>

With the budget agreement that was reached for FY 2018 and FY 2019, the Secretary of the Air Force announced the USAF's intent to retire all B-1s and B-2s and sustain a fleet comprised of 100 B-21s and 71 B-52s.<sup>43</sup> The B-21 Raider and B-52s "will form a two-bomber fleet that will incrementally replace the aging fleet of B-1 Lancer and the B-2 Spirit bombers," and the B-21 is "slated to hit full operations in the mid-2020s."<sup>44</sup> The Air Force retired 17 B-1s in 2021 and continues to execute a SLEP on

the remaining fleet of 44 to restore the bomber's engines to their original specifications. The Air Force had planned to modernize the B-2's Defense Management System but cancelled the plan in 2021 because of a software coding mismatch with its legacy computer system.<sup>45</sup> Stores Management Operational Flight Program and Common Very-Low-Frequency/Low Frequency Receiver Program elements will be fielded to ensure that this penetrating bomber remains viable in highly contested environments, keeping it fully mission-capable until it is replaced by the B-21.<sup>46</sup>

Modernization efforts for the B-52 are also underway. The jet was designed in the 1950s, and the current fleet entered service in the 1960s. The FY 2018 budget funded the re-engineering of this fleet with upgrades that include a new Long-Range Standoff (LRSO) cruise missile, improved radar, new computers, new communication links, and a new suite of electronic warfare countermeasures. The aircraft will remain in the inventory through 2050,<sup>47</sup> which means that a significant portion of the U.S. bomber fleet will be more than 80 years old.

Acquisition of the KC-46A air refueling tanker is another critical enabler for the service. As previously noted, the KC-46 has experienced a series of problems and delays, the most recent of which involves the air refueling system that currently cannot refuel fighters in an operational environment. The Air Force will have 95 KC-46s by the end of FY 2023<sup>48</sup> and will acquire another 84 tankers for a total of 179 by the end of FY 2029. The KC-46 will replace less than half of the current tanker fleet and will leave the Air Force with more than 200 aging KC-135s (already averaging 61 years old) that still need to be recapitalized.<sup>49</sup>

When the Secretary of the Air Force and the Chief of Staff of the Air Force rolled out "The Air Force We Need" in 2018 to expand the number of squadrons from 312 to 386, one of their goals was to fill the ranks of those new squadrons with only the newest generation of aircraft—F-35s, B-21s, and KC-46s—because of the capabilities that those platforms bring to bear.<sup>50</sup> Curiously, the Air Force is now acquiring the fourth-generation F-15EX, based primarily on the ill-conceived notion that it will be cheaper to acquire and operate than the F-35A, instead of buying the country's only fifth-generation aircraft in production.<sup>51</sup> The FY 2024 budget funds 24 more F-15EXs and signals an intent to cap the

purchase at just 80 jets. With the latest cuts in the fighter force, the service has reversed course on its stated intent to use them to replace Air National Guard F-15Cs; instead, approximately half of the F-15EX fleet will be fielded in active-duty units. Although the service will offset some of its fighter fleet retirements with this new hardware, the F-15EX is a step backwards and will not be survivable in anything more than low-threat environments by the time this weapons system reaches initial operating capability (IOC).

## Readiness

The 2018 National Defense Strategy's focus on peer-level war was designed to facilitate a clear and rapid paradigm shift away from the tiered levels of readiness the Air Force had adopted because of years of relentless deployments and funding shortfalls. In a move that would refine the service's focus on great-power competition as spelled out by the new NDS, Secretary of Defense James Mattis directed the Air Force to increase the mission-capable (MC) rates of the F-16, F-22, and F-35 aircraft to 80 percent by the end of September 2019.<sup>52</sup> The move was designed to make more of an all-too-small fleet of combat aircraft available to deploy in the numbers required to deter or defeat a peer adversary.

Early in 2019, then-Air Force Chief of Staff General David Goldfein stated that the service would likely not meet the 80 percent MC threshold directive until 2020, and in the spring of 2020, he made it clear that the threshold was no longer a focus for the Air Force. MC rates are a measure of how much of a certain fleet is "ready to go" at a given time, and the general stated in clear terms that he regarded the statistic as an inaccurate portrayal of the service's overall health.

Instead of using that historic marker for readiness, the service moved to highlight how deployable a portion of any fleet was within a short period of time<sup>53</sup> and shifted its focus to the number of "force elements"—fighters, bombers, and tankers—that it has across the Air Force and how quickly those forces need to be ready. One of the examples that Goldfein used was the rapid deployment of a "task force" of four B-52s to the Middle East in May 2019.<sup>54</sup> The bombers, from Barksdale Air Force Base, Louisiana, had two days from notification to deployment, and while the ability to deploy four of 58 operational bombers rapidly is a capability, it is one that is more

in line with responding to a regional contingency than it is with taking on a peer adversary.

In the USAF's FY 2020 posture statement, Secretary Wilson and General Goldfein said that "more than 90 percent of our pacing squadrons are ready to 'fight tonight' with their lead force packages" and that "these pacing squadrons are on track to reach 80% readiness before the end of Fiscal Year 2020."<sup>55</sup> A short time later, however, the service abandoned even the illusion that it was working to achieve that goal, and by 2022, a new service chief, General Charles Brown, had abandoned the pacing squadron concept and released an article on the need to redefine readiness.<sup>56</sup>

Unfortunately, the FY 2022 Air Force posture statement offered no more clarity or assurances of readiness; instead, it moved to change the paradigm of readiness into a three-phase force-generation model designed to "articulate readiness impacts and capacity limits."<sup>57</sup> In FY 2023, it morphed again into what is now known as the Air Force Generation (AFFORGEN) model, dividing the deployable combat Air Force into four six-month phases of readiness known as "Ready, Available to Commit, Reset, and Prepare." In theory, the model "builds high-end and sustainable readiness toward future missions by balancing elements of current availability, modernization and risk,"<sup>58</sup> but from the outset, it represents little more than an attempt to change the dialogue surrounding what are perhaps the lowest levels of readiness in Air Force history.

In 2017, Secretary Wilson and General Goldfein informed Congress that "[w]e are at our lowest state of full spectrum readiness in our history."<sup>59</sup> In the six years since their testimony, DOD has stifled open conversation or testimony about readiness, limiting the Air Force's ability to be forthcoming with open-source readiness indicators. Although this makes any assessment of readiness difficult, there are three areas that can support an assessment:

- MC rates,
- Aircrew training, and
- Deployability.

**MC Rates.** MC rates are defined as the percentage of a unit's aircraft that are capable of executing its mission set. Multiplying MC rates by the actual

number of aircraft within a particular fleet yields the physical operational capacity of a weapons system. Several factors drive MC rates. The two most common to mature systems are operations and maintenance (O&M) funding and qualified manning to generate, fix, and fly those jets. Collectively, they dictate the number of sorties and flight hours that units have available for aircrew training.

The last time the United States was prepared to fight a peer competitor, the Air Force had more than 700 F-15C air superiority fighters with a fleet MC rate of more than 80 percent. If only 500 were combat-coded, more than 400 mission-capable jets were ready to fight the Soviet Union. Conversely, there are 186 F-22As in the total aircraft inventory, but 28 are dedicated trainers and 16 are primary development aircraft inventory used for testing new equipment, which leaves just 142 operational jets. In 2022, the F-22A had an MC rate of 57 percent, which means that just 81 F-22As could be committed to combat at any given time.<sup>60</sup> Although the F-22A is an incredibly capable fighter and 81 F-22s would be a formidable capability against a regional threat, that number would be grossly insufficient for a peer fight.

Similarly, there are 33 operational B-1s in the Lancer fleet.<sup>61</sup> With an MC rate of 55 percent in FY 2022, 18 are available for combat at any given time during the year. The B-2 fleet's small size and 53 percent MC rate mean that, on average, just 10 are combat capable. If the B-52's 58-plane operational fleet and 59 percent mission-capable rate are added, a total of 63 Air Force bombers were capable of executing combat missions on any given day in 2022.<sup>62</sup> (For a summary of the mission-capable rates for combat-coded aircraft of the five fighter weapons systems, see Table 14.)

Maintenance manning remains relatively healthy across the board. (See Table 15.) If funding for flying hours and spare parts were robust, MC rates would rise, giving pilots more sorties and the ability to sharpen their combat mission-capable skills. Unfortunately, funding for flying hours increased only marginally in the years immediately following sequestration, and the number of available sorties falls well short of the minimum number required for pilots to be considered combat mission capable.

**Aircrew Training.** Unlike maintenance manning, the pilot shortage continues to plague the

service. In March 2017, Lieutenant General Gina M. Grosso, Air Force Deputy Chief of Staff for Manpower, Personnel, and Services, testified that at the end of FY 2016, the Air Force had a shortfall of 1,555 pilots. Of that total, the service was short 1,211 fighter pilots: 873 Active and 338 from the Active Reserve Component (ARC).<sup>63</sup> The Total Force shortfall in 2022 was 1,650: 650 Active and 1,000 ARC,<sup>64</sup> and while the Air Force would not provide the 2023 shortfall, it is very unlikely that the shortfall has not decreased.

The Air Force graduated 1,200 pilots in FY 2018 and 1,279 in FY 2019, and despite projections that 1,480 would receive their wings in 2020, COVID-19 reduced the throughput so that just 1,263 graduated from flight school. Another 1,381 graduated in FY 2021. The Air Force would not provide the 2022 graduation rates and estimates for FY 2023.

Those projected numbers rely on a very high annual graduation rate of approximately 94 percent of the candidates that enter flight school during any given year. In 2021, just 0.27 percent of flight school candidates were eliminated based on performance. The vast majority of those who washed out were eliminated for health, discipline, or other reasons that were not specifically related to performance.<sup>65</sup> The Air Force would not provide the 2022 washout rates.

Throughout the pilot shortage, the Air Force has done its best to prioritize operational unit manning instead of placing experienced fighter pilots at staffs and schools. Nevertheless, the currency and qualifications of the pilots in operational units are critically important to readiness. Air Force regulations have set minimum thresholds for sorties based on experience levels, and a series of Air Force regulations, known as the Ready Aircrew Program (RAP), dictate that inexperienced fighter pilots in combat-coded units must fly nine sorties a month and that experienced pilots must fly eight to be considered mission capable.<sup>66</sup> However, those numbers are minimum thresholds, and the tables that follow show that Air Force pilots are not meeting even those requirements. While the quality of sorties is admittedly subjective, a healthy rate of three sorties a week and flying hours averaging more than 200 hours a year have been established as "sufficient" over more than six decades of fighter pilot training.<sup>67</sup> In the words of General Bill Creech, "Higher sortie rates mean increased proficiency for our combat

TABLE 13

## Air Force Flying Hours and Weapons System Sustainment (WSS) Funding

Dollar figures are in millions.

| Fiscal Year | Flying Hours (Millions) | Flying Hours Budget (Nominal Dollars) | WSS Budget (Nominal Dollars) | Flying Hours Budget (2023 Dollars) | WSS Budget (2023 Dollars) |
|-------------|-------------------------|---------------------------------------|------------------------------|------------------------------------|---------------------------|
| 2013        | 1.16                    | \$6,200                               | \$11,306                     | \$8,122                            | \$14,811                  |
| 2014        | 1.2                     | \$6,900                               | \$11,683                     | \$8,832                            | \$14,954                  |
| 2015        | 1.2                     | \$6,900                               | \$12,300                     | \$8,832                            | \$15,744                  |
| 2016        | 1.22                    | \$5,400                               | \$13,039                     | \$6,858                            | \$16,560                  |
| 2017        | 1.16                    | \$6,100                               | \$14,469                     | \$7,625                            | \$18,086                  |
| 2018        | 1.42                    | \$6,200                               | \$14,959                     | \$7,502                            | \$18,100                  |
| 2019        | 1.45                    | \$8,700                               | \$14,792                     | \$10,353                           | \$17,602                  |
| 2020        | 1.33                    | \$5,790                               | \$15,801                     | \$6,832                            | \$18,645                  |
| 2021        | 1.24                    | \$7,800                               | \$15,332                     | \$8,736                            | \$17,172                  |
| 2022        | 1.15                    | \$7,600                               | \$15,521                     | \$7,828                            | \$15,987                  |
| 2023        | 1.12                    | \$8,900                               | \$16,697                     | \$8,916                            | \$16,697                  |
| 2024        | 1.07                    | \$9,000                               | \$18,340                     | \$9,000                            | \$18,340                  |

### SOURCES:

- Extracted from U.S. Air Force budget rollout briefs and budget summaries for fiscal years 2014–2024. For example: U.S. Department of the Air Force, *United States Air Force Fiscal Year 2014 Budget Overview*, April 2013, p. 8, <https://www.saffm.hq.af.mil/Portals/84/documents/FY14/AFD-130409-028.pdf?ver=2016-08-24-092814-517> (accessed September 19, 2023), and Table 2, “United States Air Force Budget Summary,” in U.S. Department of the Air Force, *FY 2024 Department of the Air Force Budget Overview*, p. 4, [https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB\\_YsIGxlwx4IA%3d%3d](https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB_YsIGxlwx4IA%3d%3d) (accessed September 19, 2023).
- Headquarters U.S. Air Force, A8XC/A5RW, written response to Heritage Foundation request for information, May 24, 2023.

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aircrews,”<sup>68</sup> and given the right number of sorties and quality flight time, it takes seven years beyond mission qualification in a fighter for an individual to maximize his potential as a fighter pilot.<sup>69</sup>

Flying hours and sortie rates across all fighter platforms fell to historic lows during the COVID-19 pandemic, and the average line mission-ready fighter pilot received fewer than 1.4 sorties a week and less than 131 hours of flying time per year.<sup>70</sup> At those levels, pilot competence and confidence drop to the point where excellent pilots begin to question their ability to execute even very basic tasks. In a speech delivered on September 21, 2022, General Mark Kelly, Commander, Air Combat Command, stated that the average fighter pilot received just 6.8 hours

of flying time per month (less than two hours per week) for a total of 81.6 hours in 2021.<sup>71</sup> No matter which data point is selected, the numbers reflect an Air Force that would struggle in a fight with a regional competitor and could well founder in a war with a peer adversary.

The last time fighter pilots received an average of 150 hours of flying time and more than two sorties a week for an entire year was in 2015 when the service was beginning to recover from sequestration. In spite of a budget that has increased by more than 75 percent in the years since then, the number of flying hours the Air Force funds has remained very low, and the service has failed to execute the programmed number of hours year after year. In other

TABLE 14

## Mission-Capable Combat-Coded Fighters in the Active-Duty Air Force

|              | Combat-Coded Fighters | Average Age in Years | FY 2022 Mission-Capable Rate | Mission-Capable Combat-Coded Fighters |
|--------------|-----------------------|----------------------|------------------------------|---------------------------------------|
| A-10C        | 109                   | 39                   | 70%                          | 76                                    |
| F-15E        | 164                   | 31                   | 52%                          | 85                                    |
| F-16C        | 309                   | 33                   | 71%                          | 219                                   |
| F-22A        | 110                   | 17                   | 57%                          | 63                                    |
| F-35A        | 194                   | 5                    | 65%                          | 127                                   |
| <b>Total</b> | <b>886</b>            |                      |                              | <b>570</b>                            |

### SOURCES:

- Combat-Coded Fighters: U.S. Department of the Air Force, *FY 2024 Department of the Air Force Budget Overview*, [https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB\\_YslGx1wx4IA%3d%3d](https://www.saffm.hq.af.mil/Portals/84/documents/FY24/Budget/FY24%20Budget%20Overview%20Book.pdf?ver=JjFXW89XqB_YslGx1wx4IA%3d%3d) (accessed September 19, 2023), and International Institute for Strategic Studies, *The Military Balance 2023: The Annual Assessment of Global Military Capabilities and Defence Economics* (London: Routledge, 2023), pp. 43–47. Notes: Where the two publications were in conflict for total aircraft inventory, the USAF numbers were generally adopted. Neither document specifies numbers of active-duty combat-coded aircraft. Those figures were derived by tallying the total number of fighters by type and dividing that number by the total number of active-duty squadrons flying those types of aircraft. The numbers and types of aircraft associated with Weapons Instructor Course Squadrons, Adversary Tactics, Test, OT&E, and other units are not standard/de-terminable and could not be assessed. The associated error is minimized by totaling all similar fighter aircraft (F-16, F-15C, etc.), dividing them by the total number of squadrons flying those aircraft, and spreading the error equally across all combat-coded fighter and training units. The total number of fighters associated with non-fighter training unit (FTU) squadrons was counted as combat-coded.
- Table, “Aircraft Total Active Inventory (TAI) (As of Sept. 30, 2022),” in “Air Force & Space Forces Almanac 2023,” *Air & Space Forces Magazine*, Vol. 106, Nos. 6 and 7 (June/July 2023), p. 66, [https://www.airandspaceforces.com/app/uploads/2023/06/Almanac2023\\_Fullissue\\_REV2.pdf](https://www.airandspaceforces.com/app/uploads/2023/06/Almanac2023_Fullissue_REV2.pdf) (accessed August 25, 2023).

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words, even when funding has been available, the service has failed to use it to improve pilot readiness. Some argue that the lack of hours in the cockpit is being offset by time/sorties in high-fidelity simulators, but this presumes that simulator time is an effective substitute for time in a real aircraft. The Air Force RAP requires inexperienced F-35 pilots to fly a minimum of nine times a month in the jet and a minimum of three times a month in high-fidelity simulators.<sup>72</sup> The average line F-35 pilot received just six sorties and 2.2 simulators a month in 2022, which means that by definition they are not combat mission capable.

Prioritizing readiness and significantly increasing funding for the flying hour program could easily resolve this issue, but the service has been hobbling itself for years. The flying hours funded within the service’s budget dropped from 1.33 million in FY 2020 to 1.24 million in FY 2021 to 1.15 million in

FY 2022,<sup>73</sup> and even then, the service was able to fly only 1.097 million hours before the account ran out of money. The number of hours funded fell again to 1.13 million in FY 2023 and has declined still more to 1.07 million in the President’s budget for FY 2024.<sup>74</sup> It should be noted that the service budgeted for and actually executed more flying hours in 2013, the year sequestration drove draconian cuts in DOD’s budget, than it has in any of the past three years.<sup>75</sup> Every reduction has been accompanied by a note stating that the hours were budgeted to “the maximum executable level,” but that is at best misleading because the only constraint beyond funding is maintenance manning, which has been healthy since 2019. (See Table 15.)

The current generation of fighter pilots—those who have been actively flying for the last seven years—has never experienced a healthy rate of operational flying. It will take several years of flying

TABLE 15

| <b>Air Force<br/>Maintenance<br/>Manning</b> | <b>Skill Level</b>   | <b>Authorized</b> | <b>Assigned</b> | <b>Manning<br/>Percentage</b> |
|--|----------------------|-------------------|-----------------|-------------------------------|
|  | 3-level (Apprentice) | 17,819            | 16,857          | 95%                           |
|  | 5-level (Journeyman) | 36,616            | 36,387          | 99%                           |
|  | 7-level (Craftsman)  | 18,632            | 17,630          | 95%                           |

SOURCE: Headquarters U.S. Air Force, A8XC/A5RW, written response to Heritage Foundation request for information, May 24, 2023.

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three or more sorties a week to regain the level of competence required to dominate a peer competitor, but the Air Force is not moving to make that happen. Readiness as measured by the Air Force's long-standing metrics is incredibly low, and the criteria for the Chief of Staff's "Redefine Readiness or Lose" concept remain undefined.<sup>76</sup> Continuing down this path will further erode combat capability, competency, and flight safety for Air Force pilots.

**Deployability.** Because long-term inspections and depot-level work affect the availability of support equipment and aircraft, it takes three active-duty squadrons to deploy two squadrons forward. On any given day, units have several aircraft that are not flyable because of long-term inspections, deep maintenance, or the need for spare parts. By using aircraft from one of the three squadrons to "plus up" the other two, the wing could immediately deploy two full-strength units into combat. The handful of fully flyable jets and pilots left at the home station could then be used to train new and inbound pilots up to mission-ready status so that, among other things, they could replace pilots that were lost during combat.<sup>77</sup> Up until the end of the Cold War, the Air Force was organized using a three-squadron wing to handle the associated load.

Normally, active-duty fighter squadron manning levels are based on a ratio of 1.25 aircrew members for every aircraft,<sup>78</sup> which means that a unit with 24 assigned aircraft should have 30 line pilots and five supervisor pilots who are combat mission ready.<sup>79</sup> Flight times, sortie rates, mission planning teams, and flight supervision requirements are significantly higher in combat, and to cover those requirements, the manning ratio normally increases to 1.50 pilots per aircraft, or 36 line pilots per squadron. In other words, every squadron deployed to fight

requires six more pilots than it has on its roster.<sup>80</sup> Pilots from "donor" squadrons can fill those slots for the deploying units.

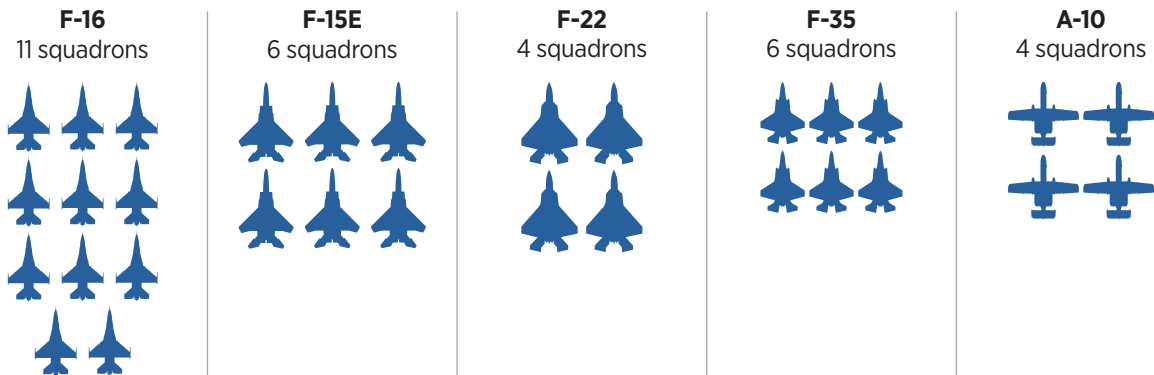
With the downsizing that has taken place since the end of the Cold War and the reduction in the number of fighter squadrons, the Active Air Force has reduced the number of fighter squadrons to two or even one in many wings. All operational Guard and Reserve wings are comprised of a single squadron, which complicates the math behind the total number of deployable fighter squadrons.<sup>81</sup>

Of the 54 operational fighter squadrons on the Air Force roster, 31 are Active and 23 are Guard or Reserve Units. (See Figure 4.) Using the notion that it takes three squadrons to get two active-duty squadrons forward, the airframe disposition of each active-duty wing would allow just 21 active-duty fighter squadron equivalents (with 24 fighter aircraft each) to deploy to a fight. This equates to 480 active-duty fighters that could deploy to meet a crisis situation, which is well short of the 600 it takes to win a single MRC and means that a war with a peer competitor would draw heavily on the service's strategic reserve.

Guard and Reserve units face the same manning and deployment challenges that the active-duty force faces, except that the vast majority of those units have just one fighter squadron per wing, further straining their ability to muster the airframes and manning needed to meet an emergency deployment.<sup>82</sup> Planning for low-threat, low-intensity deployments to Operation Iraqi Freedom and Operation Enduring Freedom took this into consideration by mapping deployments out months (often years) in advance of the required movement, allowing pilots to deconflict their civilian work schedules not just for the deployment, but also to get the training

FIGURE 4

## Air Force Active-Duty Combat-Coded Fighter Squadrons (31 Total)

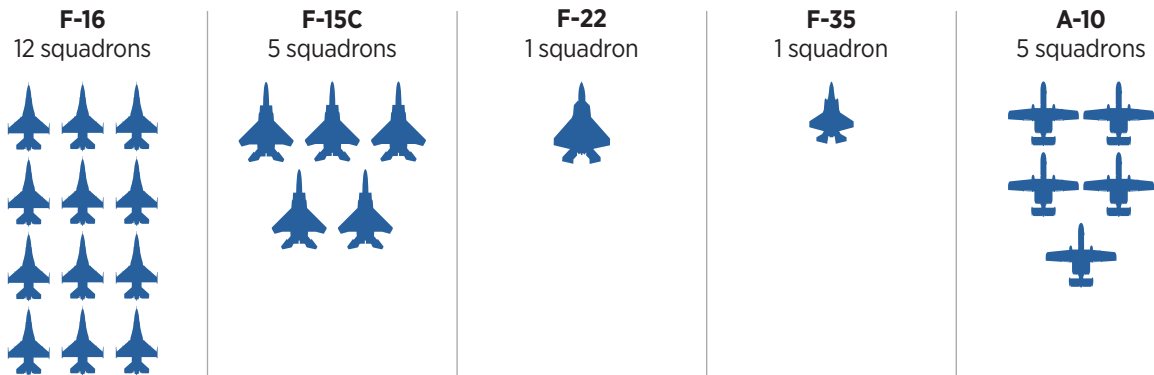


**SOURCE:** Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 24, 2023. The number of squadrons has been adjusted to account for the closure of the last F-15C squadron at Kadena Air Base, Japan.

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FIGURE 5

## Air National Guard and Air Force Reserve Combat-Coded Fighter Squadrons (24 Total)



**SOURCE:** Headquarters U.S. Air Force, Deputy Chief of Staff for Operations, written response to Heritage Foundation request for information, May 24, 2023.

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and time in the air that they needed to employ successfully in those low-threat combat operations.<sup>83</sup> Nevertheless, it was common for Guard units to pull pilots from other units to fulfill manning requirements for “rainbow” fighter squadrons.<sup>84</sup> In a conflict where there is little time from warning order to

deployment, it would likely take two Guard and Reserve squadrons to enable one to deploy forward.<sup>85</sup>

The average Guard and Reserve fighter squadron has one-third fewer jets than similar active-duty units have. By rainbowing units with similar aircraft, the Guard and Reserve could muster 12 squadrons

as a strategic reserve of 288 fighters that could deploy sometime after the active-duty units deploy. In other words, the service could muster just 768 fighters (480 Active and 288 Guard and Reserve) for a peer-level fight. The Guard and Reserve numbers do not just limit deployable airframes. Other factors such as manning levels would also limit the number of sorties and the amount of combat power that those fighters could generate continually in a high-end confrontation with a peer competitor.

The declaration in Air Force posture statements for FY 2020 and FY 2021 that lead force packages within the service's 204 pacing squadrons are ready to fight conveys the fact that only portions of its most capable squadrons have enough mission-capable aircraft and aircrews that are "closer" to the minimum Combat Mission Capable sortie requirements to respond somewhat readily to a crisis. Because of the pilot shortage, actual unit manning levels in fighter squadrons are below peacetime requirements, which is already not enough to meet the increased demands and the tempo required for

combat operations. While the Active Component would not release its figures on fighter unit manning, the Air National Guard (ANG) released their manning levels, which *should be* representative for active-duty units as well. Currently, ANG fighter units are manned at 88 percent, which brings the pilot-to-aircraft ratio down to 1.1:1—significantly lower than the planned 1.25:1.

The service has already moved the majority of pilots who were assigned to staff or other non-flying billets back to the cockpit to deal with the most critical aspect of the manning shortfall. Thus, the only way units can meet wartime manning requirements is by pulling pilots from other "donor" squadrons. The complications involved are significant and suggest that the portions of the 54 fighter squadrons that are unable to deploy immediately in a crisis could be combined to create more combat power. Unfortunately, the majority of aircraft and aircrew that are left are needed for homeland defense, to train replacement pilots, or to replace aircraft that are lost through combat attrition.

## Scoring the U.S. Air Force

### Capacity Score: Marginal

In responding to major combat engagements since World War II, the Air Force has deployed an average of 28 fighter squadrons. Based on an average of 18 aircraft per squadron, that equates to a requirement of 500 Active Component fighter aircraft to execute one MRC, and adding a planning factor of 20 percent for spares and attrition reserves brings the number to 600 aircraft—aircraft that are an essential element of Air Force combat power.

As part of its overall assessment of capacity, the *2024 Index* looks for 1,200 active-duty, combat-coded fighter aircraft to meet the baseline requirement for two MRCs.<sup>86</sup> That number of fighters lines up well with the fighter requirement from the 2018 TAFWN, which the Commander of Air Combat Command recently reaffirmed is the actual capacity requirement for today's Air Force.<sup>87</sup> The bomber, tanker, and strategic air requirements from that study are also used in this assessment.

- **Two-MRC Fighter—Threshold:** 1,200 combat-coded active-duty fighters / 62 squadrons.

- **Two-MRC Fighter—Actual 2023 Level:** 886 active-duty combat-coded fighters (75 percent) / 54 total force squadrons (88 percent).
- **TAFWN Bomber Squadron—Threshold:** 14 combat-coded bomber squadrons / 140 bombers.
- **TAFWN Bomber Squadron—Actual 2023 Level:** nine combat-coded bomber squadrons (64 percent) / 111 combat-coded bombers (79 percent).
- **TAFWN Tanker Squadron—Threshold:** 54 tanker squadrons / 540 combat-coded tankers.
- **TAFWN Tanker Squadron—Actual 2023 Level:** 43 combat-coded tanker squadrons (80 percent) / 454 combat-coded tankers (84 percent).
- **TAFWN Airlift Squadron—Threshold:** 54 airlift squadrons / 540 combat-coded airlifters.



- **TAFWN Airlift Squadron—Actual 2023 Level:** 53 combat-coded airlift squadrons (99 percent) / 545 combat-coded airlifters (100 percent).

Based on a pure count of combat-coded squadrons and platforms that have achieved IOC, the USAF currently is at 83 percent of the capacity required to meet a two-MRC/TAFWN benchmark. This is 3 percent less than the 86 percent reported in the *2023 Index*, and the disposition of those assets limits the ability of the service to deploy them rapidly to a crisis region. The active fighter and bomber assets that are available might prove adequate to fight and win a single regional conflict, but the time and casualties/losses involved would be much higher. When coupled with the low mission capability rates of those fighter aircraft (see Table 14), this means that it would take global sourcing to field the combat fighter force required for a single MRC and that the rest of the world would be left uncovered.

Nevertheless, the capacity level is well within the methodology's range of "marginal." Programmed aircraft retirements are set to exceed acquisitions over the FYDP, which means that capacity will continue to trend downward.

### **Capability Score: Marginal**

The Air Force's capability score is "marginal," based on scores of "strong" for "Size of Modernization Program," "marginal" for "Age of Equipment" and "Health of Modernization Programs," but "weak" for "Capability of Equipment." These assessments are the same as those in the *2023 Index*. New F-35 and KC-46 aircraft continue to roll off their respective production lines, but these additions are more than offset by aircraft retirements. As a consequence, this score will probably not improve over the next three to five years.

### **Readiness Score: Very Weak**

The Air Force scores "very weak" for readiness, the same grade it received in the *2023 Index and the lowest on the five-grade scale*. The USAF's sustained pilot deficit certainly contributes to this assessment, but the incredibly low sortie rates and flying hours would prevent any Air Force combat-coded fighter squadron from being able to execute all or even most of its wartime mission. Sortie rates improved

marginally in 2022, but they are nowhere near what pilots need if they are to rebuild the competencies required to excel in a peer fight.

At best, half of the cadre of pilots within the most capable units will be able to execute only "some" of the unit's wartime missions. Air Force mission-capable rates are hovering around the same low levels where they were in 2021, and the current budget unfortunately will further reduce operational training sorties. This reflects a service that is content with being at the bottom of the readiness ladder. There is not a fighter squadron in the Air Force that holds the readiness levels, competence, and confidence levels that it would need to square off against a peer competitor,<sup>88</sup> and readiness is continuing to spiral downward.

The FY 2023 Air Force statement mentions the word "ready" just four times and never in the context of current readiness levels.<sup>89</sup> The Air Force should be prepared to respond quickly to an emergent crisis not with a "task force" of four bombers, but with the speed and capacity required to stop a peer competitor in its tracks. With the significant curtailment of deployments in support of the global war on terrorism, the Air Force should be much further along in its full-spectrum readiness than we have seen to date.

### **Overall U.S. Air Force Score: Very Weak**

This is a result of the lowest of the USAF's three scores: a capacity score of "marginal," capability score of "marginal," and readiness score of "very weak." As with a three-legged stool, success or failure is determined by the weakest leg. The shortage of pilots and flying time for those pilots degrades the ability of the Air Force to generate the quality of combat air power that would be needed to meet wartime requirements. Fighter pilots should receive an average of three or more sorties a week and 200 hours per year to develop the skill sets needed to survive in combat, but while some readiness issues can be written off to the effects of COVID-19, the service is making a calculated decision not to acquire more aircraft or fund the accounts required for any significant increase in training and numbers of sorties.

Although there is a chance the U.S. would win a single MRC, there is little doubt that the Air Force would struggle in war with a peer competitor. Both the time required to win such a conflict

and the attendant rates of attrition would be much higher than they would be if the service had moved aggressively to increase high-end training and acquire the fifth-generation weapon systems that it so clearly needs.

### U.S. Military Power: Air Force

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

# AIR FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Strategic Bomber

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>B-52 Stratofortress</b></p> <p>Inventory: <b>76</b><br/>Fleet age: <b>62</b> Date: <b>1961</b></p> <p>The B-52, the oldest of the bombers, provides global strike capabilities with conventional or nuclear payloads. Programmed upgrades for the B-52 include a new communications, avionics, and Multi-Functional Color Displays. The Air Force plans to use this aircraft through the 2050s as a complement to the B-21 Raider.</p>  | 1         | 2                | <p>The B-21 is an advanced stealth bomber that is currently programmed to replace all B-1s and B-2s in the Air Force bomber fleet beginning in the late 2020s and expand to a fleet of at least 100 aircraft. Flight testing, originally scheduled for late 2022, has been pushed back to 2023 because of unspecified delays. However, the Raider is still projected to enter service in the mid-2020s.</p> |            |              |
| <p><b>B-1B Lancer</b></p> <p>Inventory: <b>45</b><br/>Fleet age: <b>36</b> Date: <b>1986</b></p> <p>Nicknamed “The Bone,” the B-1B Lancer is a long-range, multi-mission, supersonic conventional bomber that has served the United States Air Force since 1985. Originally designed for nuclear capabilities, the B-1 switched to an exclusively conventional combat role in the mid-1990s. In September 2020, the entire Air Force B-1B Lancer fleet completed the Integrated Battle Station upgrade to modernize the jet’s datalinks, cockpit displays, and test system. The B-1B is scheduled to be phased out in 2032.</p> | 2         | 2                |   |            |              |
| <p><b>B-2 Spirit</b></p> <p>Inventory: <b>20</b><br/>Fleet age: <b>28</b> Date: <b>1997</b></p> <p>The B-2 bomber provides the USAF with global strike capabilities for both nuclear and conventional payloads. The stealth bomber’s communication suite is currently being upgraded, and efforts are being made to increase its loadout and the ability of its payload to strike hardened and buried targets. The current plan is to begin phasing out the B-2 in 2032.</p>  | 3         | 4                |   |            |              |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.

# AIR FORCE SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Ground Attack/Multi-Role Aircraft

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>A-10 Thunderbolt II</b></p> <p>Inventory: <b>239</b><br/>Fleet age: <b>41</b> Date: <b>1977</b></p> <p>The A-10 is the only USAF platform designed specifically for close air support mission using both self-designated precision guided munitions and an internal 30MM cannon. The retirement of the A-10 has been in discussion for years, and in FY 2023, Congress finally allowed the Air Force to retire 18 A-10s. Air Force Chief of Staff General Charles Brown stated that he hopes to retire all A-10s by 2029.</p>     | 2         | 2                | <p><b>F-35A</b></p> <p>Timeline: <b>2016–2035</b></p> <p>The F-35A is a multi-role stealth fighter that achieved IOC on August 2, 2016. The Block 4 version, meant to effect a significant increase in combat capability, remains under development, leading to concerns over rising retrofit costs for existing F-35 aircraft that have led to reduced procurement in recent years. The Block 4 modification will be retrofitted into all Block 3 F-35s.</p> | 4          | 3            |
| <p><b>F-16C/D Falcon</b></p> <p>Inventory: <b>841</b><br/>Fleet age: <b>33</b> Date: <b>1980</b></p> <p>The F-16 is a multi-role aircraft that is capable of tactical nuclear delivery, all-weather strike, and Suppression of Enemy Air Defenses (SEAD). Improvements to the F-16's radar, mission computer, cockpit displays, and an ongoing Service Life Extension Program (SLEP) will keep this jet flying through the late 2040s.</p>  | 2         | 2                | <p><b>PROCUREMENT</b></p> <p>543 1,220</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$59,788 \$149,925</p>   |            |              |
| <p><b>F-35A Lightning</b></p> <p>Inventory: <b>477</b><br/>Fleet age: <b>5</b> Date: <b>2016</b></p> <p>See Ground Attack Replacement Program entry. The F-35 is a multi-role stealth fighter that became operational in 2016. By the end of FY 2024, the Air Force will have received 477, but the rate of acquisition has decreased from a planned 80 fighters a year to 48 in FY 2024, putting the original program of record to acquire a total of 1,763 aircraft in doubt.</p>   | 5         | 5                |   |            |              |
| <p><b>F-15E Strike Eagle</b></p> <p>Inventory: <b>218</b><br/>Fleet age: <b>31</b> Date: <b>1989</b></p> <p>The F-15E is a multi-role aircraft that is capable of all-weather, deep interdiction/attack, and tactical nuclear weapons delivery. Upgrades include an AESA radar, EPAWSS self-defense suite, a new central computer, and cockpit displays. The Air Force recently announced that it planned to retire more than half of its fleet of F-15Es (119 of 218) to help fund recapitalization of the combat air force (CAF).</p> | 2         | 2                |   |            |              |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.

# AIR FORCE SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Fighter Aircraft

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |         |         |   |   |
|--|-----------|------------------|---|------------|--------------|---------|---------|---|---|
| <p><b>F-15C/D Eagle</b></p> <p>Inventory: <b>92</b><br/>Fleet age: <b>39</b> Date: <b>1975</b></p> <p>The F-15C/D is an air superiority fighter that has been in service since the late 1970s. It is receiving upgrades that include a new AESA radar and self-defenses needed to survive and fight in contested airspace. The F-15C/D inventory is being reduced by the Air Force after determinations that a Service Life Extension Program (SLEP) would not be cost-effective. A divestment of 57 aircraft is planned in FY 2024, and the last F-15 C/D will be retired by the end of the decade.</p>   | 1         | 2                | <p><b>F-15 EX</b></p> <p>Timeline: <b>TBD-2025</b></p> <p>The F-15EX is the most advanced Eagle variant based on the F-15QA as a replacement for the legacy F-15C/D. The USAF awarded Boeing a \$1.2 billion contract for the first eight of up to 144 new-build F-15EXs on July 13, 2020. Congress funded 12 F-15EXs in FY 2021, 17 in FY 2022, and 24 in FY 2023, and the President's Budget for FY 2024 includes 24 more of these fourth-generation fighters.</p> <p><b>PROCUREMENT</b></p> <table border="1"> <tr> <td>46</td> <td>48</td> </tr> </table> <p><b>SPENDING (\$ millions)</b></p> <table border="1"> <tr> <td>\$4,579</td> <td>\$5,266</td> </tr> </table> | 46         | 48           | \$4,579 | \$5,266 | 2 | 1 |
| 46   | 48        |                  |   |            |              |         |         |   |   |
| \$4,579  | \$5,266   |                  |   |            |              |         |         |   |   |
| <p><b>F-22A Raptor</b></p> <p>Inventory: <b>153</b><br/>Fleet age: <b>17</b> Date: <b>2005</b></p> <p>The F-22 is the preeminent air superiority stealth fighter aircraft, modified to enable delivery of precision-guided weapon. It is currently undergoing a modification called RAAMP that will improve reliability, maintainability and performance. The jet will also begin fielding Link-16 in FY 2022, which will allow it to transmit data with legacy aircraft via the Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/JTRS). The Air Force could begin to replace the F-22 as early as the 2030s as it fields the Next Generation Air Dominance (NGAD) fighter that is currently under development.</p> | 4         | 5                | None  |            |              |         |         |   |   |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.

# AIR FORCE SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Tanker

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>KC-10 Extender</b></p> <p>Inventory: <b>14</b><br/>Fleet age: <b>39</b> Date: <b>1981</b></p> <p>The KC-10 is multi-role tanker and airlift platform that can refuel both boom-compatible and drogue-compatible fighters on the same mission. Recent modifications have enabled a service life extension through 2045. However, the Air Force has determined that the fleet is too costly to sustain, and all KC-10s will be retired by September 2024.</p>  | 2         | 5                | <p><b>KC-46</b></p> <p>Timeline: <b>TBD-2027</b></p> <p>This aircraft is a multi-role tanker/airlift platform that can refuel both boom-compatible and drogue-compatible fighters on the same mission. The Air Force accepted the first of 179 programmed aircraft in 2019. The program has significant problems with the remote vision system and boom that currently limit it to refueling fourth-generation jets in non-combat operations. The Air Force will receive another 15 jets in FY 2024 with this same limitation, bringing the total number of KC-46s in the inventory to 139.</p> | 4          | 3            |
| <p><b>KC-135 Stratotanker</b></p> <p>Inventory: <b>365</b><br/>Fleet age: <b>62</b> Date: <b>1957</b></p> <p>The KC-135 is a multi-role tanker/airlift platform that is capable of simultaneous cargo and AE missions. It has undergone several modifications, mainly engine upgrades to improve performance and reliability. Further planned modifications include Block 45 upgrades (additional glass cockpit display for engine instrumentation, a radar altimeter, advanced autopilot, and modern flight director) at a rate of 38 aircraft per year through 2026. Part of the fleet will be replaced with the KC-46; the remainder are scheduled to be in service through 2050.</p> | 1         | 5                | <p><b>PROCUREMENT</b></p> <p>124 51</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$20,160 \$10,467</p>   |            |              |
| <p><b>KC-46 Pegasus</b></p> <p>Inventory: <b>102</b><br/>Fleet age: <b>2</b> Date: <b>2020</b></p> <p>The Pegasus is a multi-role tanker/airlift platform that can refuel both boom-compatible and drogue-compatible fighters on the same mission. The Air Force accepted the first of 179 programmed aircraft in 2019. The program has significant problems with the remote vision system and boom that currently limit it to refueling fourth-generation jets in non-combat operations.</p>  | 5         | 1                |   |            |              |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.

# AIR FORCE SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Heavy Lift

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>C-5M Galaxy</b></p> <p>Inventory: <b>52</b><br/>Fleet age: <b>36</b> Date: <b>1970</b></p> <p>The C-5 is the USAF's largest mobility aircraft. It can transport 270,000 pounds of cargo over intercontinental ranges and is air refuellaible. The "M" models are heavily modified C-5A/Bs that have new engines, avionics, and structural/reliability fixes. Ongoing modifications include a new weather radar and mission computer and improved Large Aircraft IR Countermeasures (LAIRCM).</p>                                     | 2         | 5                | None                |            |              |
| <p><b>C-17 Globemaster III</b></p> <p>Inventory: <b>222</b><br/>Fleet age: <b>21</b> Date: <b>1995</b></p> <p>The C-17 is a heavy-lift, strategic transport that is capable of direct tactical delivery of all classes of military cargo. It is the U.S. military's core airlift asset. The C-17 is air refuellaible and can operate on small airfields (3,500 feet by 90 feet). Ongoing modifications include next-generation Large Aircraft Infrared Countermeasures (LAIRCM) and structural, safety, and sustainment modifications.</p> | 4         |                  |                     |            |              |

## Medium Lift

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>C-130J Super Hercules</b></p> <p>Inventory: <b>155</b><br/>Fleet age: <b>13</b> Date: <b>2006</b></p> <p>The C-130J is an upgraded tactical airlift platform with a medium-lift capability and multiple variants that include the C-130J-30, AC-130J gunship, and HC-130J rescue/air refueling platform. The C-130J-30 can carry 92 airborne troops and lift more than 40,000 pounds of cargo. The Air Force Active Component completed its transition to the C-130J in October 2017, and thanks to congressional supplementals, upgrades for units flying the C-130H in the Guard Reserve are still underway.</p> | 5         | 5                | <p><b>C-130J</b></p> <p>Timeline: <b>2006-2022</b></p> <p>The C-130J is an upgraded tactical airlift platform with a medium-lift capability and multiple variants that include the C-130J-30, AC-130J gunship, and HC-130 rescue/air refueling platform. The C-130J-30 can carry 92 airborne troops and lift more than 40,000 pounds of cargo. The Air Force Active Component completed its transition to the C-130J in October 2017, and thanks to congressional supplementals, upgrades for units flying the C-130H in the Guard Reserve are still underway.</p> <p><b>PROCUREMENT</b> <span style="float: right;"><b>SPENDING (\$ millions)</b></span></p> <p>218 <span style="float: right;">\$20,576 \$35</span></p> | 5          | 5            |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.

# AIR FORCE SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Intelligence, Surveillance, and Reconnaissance (ISR)

| Program   | Score | Score | Procurement and Spending  |
|---|-------|-------|---|
| <p><b>RQ-4 Global Hawk</b></p> <p>Inventory: <b>9</b><br/>Fleet age: <b>12</b> Date: <b>2011</b></p> <p>The Global Hawk is a strategic, high-altitude, long-endurance (HALE) “deep look” ISR platform that complements satellite and manned ISR. Unlike the MQ-9, which is a medium-altitude, long-endurance UAV, the RQ-4 flies significantly higher and longer range.</p>   | 5     | 1     | <p><b>MQ-9 Reaper</b></p> <p>Timeline: <b>2007-2022</b></p> <p>The MQ-9 is a hunter/killer unmanned Aerial Vehicle (UAV). The Air Force planned to end procurement of the Reaper in FY 2021, but in FY 2021, Congress decided to procure an additional 16 of these UAVs. With the decline of U.S. counterinsurgency efforts, the Air Force has announced plans to transition the MQ-9 away from counterinsurgency to operating in near contested airspace. The Air Force is planning to replace the Reaper with a more survivable, flexible, and advanced platform as early as 2031.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>4 \$539</p> |
| <p><b>RC-135 Rivet Joint</b></p> <p>Inventory: <b>25</b><br/>Fleet age: <b>60</b> Date: <b>1972</b></p> <p>The RC-135V/W is tasked with real-time electronic and signals intelligence-gathering, analysis, and dissemination in support of theater- and strategic-level commanders. The extensively modified C-135s detect, identify, and geolocate signals throughout the electromagnetic spectrum. Rivet Joint is used primarily to exploit electronic battlefield intelligence and deliver nearly real-time ISR information to tactical forces, combatant commanders, and National Command Authorities. Ongoing upgrades include new direction-finding COMINT sensors, precision ELINT/SIGINT system integration, wideband SATCOMS, enhanced nearly real-time data dissemination, and new steerable beam antenna. The Air Force’s most recent utility assessment projected that the RC-135 would fly through 2050.</p> | 1     | 4     | None  |
| <p><b>U-2 Dragon Lady</b></p> <p>Inventory: <b>31</b><br/>Fleet age: <b>41</b> Date: <b>1956</b></p> <p>The U-2S is the Air Force’s only manned, strategic, high-altitude, long-endurance ISR platform and is capable of SIGINT, IMINT, and MASINT collection. The aircraft’s modular payload systems allow it to carry a wide variety of advanced optical, multispectral, EO/IR, SAR, SIGINT, and other payloads simultaneously. Its open system architecture also permits rapid fielding of new sensors to counter emerging threats and requirements. The Air Force is currently upgrading the U-2 with ASARS-2B/C, which will improve the U-2’s high-altitude, deep-look radar ground-mapping, moving-target, and maritime capabilities. The Air Force recently announced that it would retire the fleet of U-2s in 2026.</p>  | 1     | 4     |   |

**NOTE:** See page 507 for details on fleet ages, dates, timelines, and procurement spending.



# AIR FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Armed Reconnaissance

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>MQ-9 A/B Reaper</b></p> <p>Inventory: <b>208</b><br/>Fleet age: <b>7</b> Date: <b>2011</b></p> <p>The MQ-9B is a medium-altitude to high-altitude, long-endurance hunter-killer RPA (remotely piloted aircraft) that is tasked primarily with eliminating time-critical and high-value targets in permissive environments. Additional roles include CAS, CSAR, precision strike, armed overwatch, target development/designation, and terminal weapon guidance. The MQ-9 fulfills a secondary tactical ISR role utilizing its Multispectral Targeting System-B (MTS-B), Lynx SAR, and/or Gorgon Stare wide-area surveillance. The USAF is attempting to end MQ-9 procurement and seeks to replace the Reaper with a more survivable, flexible, and advanced platform as early as 2031.</p> | 4         | 2                | None                |            |              |

## Command and Control

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>E-3 Sentry</b></p> <p>Inventory: <b>16</b><br/>Fleet age: <b>44</b> Date: <b>1977</b></p> <p>The E-3 Airborne Warning and Control System (AWACS) is tasked with all-weather, air and maritime surveillance, command and control, battle management, target, threat, and emitter detection, classification, and tracking. Ongoing upgrades include an urgent operational requirement to shorten kill-chains on time-sensitive targets, modernizing airborne moving target indication, and adding high-speed jam-resistant Link 16. Due to difficulties sustaining the E-3, the Air Force will retire 15 of its fleet of 31 AWACS over FY 2023 and FY 2024. While Boeing's E-7A Wedgetail will likely be selected in FY 2023 to replace the E-3s, the gap between retirement of the E-3 and fielding of the E-7 will be significant.</p> | 1         | 1                | None                |            |              |
| <p><b>E-8 JSTARS</b></p> <p>Inventory: <b>0</b><br/>Fleet age: <b>23</b> Date: <b>2001</b></p> <p>E-8C is a ground moving target indication (GMTI), airborne battlefield management/command and control platform. Its primary mission is providing theater commanders with ground surveillance data to support tactical operations. Congress approved the divestiture of the E-8 in 2022, and the Air Force will retire the last three remaining E-8s in FY 2024.</p>  |           |                  |                     |            |              |

**NOTES:** See Methodology for descriptions of scores. The date is the year the platform achieved initial operational capability. The timeline is from the year the platform achieved initial operational capability to its final procurement. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E).

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### KC-46 Pegasus

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### MQ-9 Reaper

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#### **B-52 Stratofortress**

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#### **B-1B Lancer**

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#### **A-10 Thunderbolt II**

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#### **F-16 Fighting Falcon**

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78. See Table A.1, “Calculating Unit Absorption Capacity,” in Albert A. Robbert, Anthony D. Rosello, Clarence R. Anderegg, John A. Ausink, James H. Bigelow, William W. Taylor, and James Pita, *Reducing Air Force Fighter Pilot Shortages* (Santa Monica, CA: RAND Corporation, 2015), p. 33, [https://www.rand.org/content/dam/rand/pubs/research\\_reports/RR1100/RR1113/RAND\\_RR1113.pdf](https://www.rand.org/content/dam/rand/pubs/research_reports/RR1100/RR1113/RAND_RR1113.pdf) (accessed August 26, 2023).
79. Even though active-duty fighter squadrons have an average of 30 aircraft per squadron, that number includes maintenance spare and attrition reserve platforms. Manning is based on Primary Assigned Aircraft (PAA), which is 24 aircraft for active-duty fighter squadrons.
80. Based on a squadron with 24 Primary Assigned Aircraft. Units with 18 PAA require four additional pilots.
81. Perversely, this reduction of squadrons per wing means that in many wings, a wing staff with its commanding officer (usually a colonel but sometimes a brigadier general) oversees the operation of a single squadron that has its own staff and commander. In such a situation, the question then becomes: Why are both commanders and staffs needed?
82. The very premise of these units is that they are manned with citizen soldiers whose main source of income is a full-time civilian job and who are committed to travel and temporary duty locations that make them unavailable for days or weeks at a time. Those units would likely require several days to assemble the manpower needed to deploy, and once an assessment of their real mission currency was made, they would need some period of intense training before a responsible senior leader could employ them in a fight with a peer competitor.
83. “Deployments most suited to the ARC are those in which there is long lead time (six months or more), and in which the operation is of short duration (six days or less), requiring a small force package (12 aircraft or less), and in which the scheduling is flexible.” John T. Correll, “Future Total Force,” *Air Force Magazine*, Vol. 82, No. 7 (July 1999), p. 32, <https://www.airforcemag.com/PDF/MagazineArchive/Documents/1999/July%201999/0799total.pdf> (accessed August 26, 2023).
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85. Interview with senior Air National Guard leader, November 20, 2019.
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# U.S. Marine Corps

Dakota L. Wood

The 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. But every Marine has always been and remains focused primarily on combat: Every Marine is first a rifleman.

Over the past several decades, the Marine Corps has positioned itself for crisis response, but while the Corps has maintained its historical, institutional, and much of its doctrinal focus on operations in maritime environments, the majority of its operational experience at least since 2003 has been in sustained land operations. This has led to a dramatic decline in the familiarity of most Marines with conventional amphibious operations and other types of employment within a distinctly maritime setting.<sup>1</sup> Even with the conclusion of military operations in Afghanistan in 2021, by which time the U.S. military presence had been reduced to just 2,500 military personnel, the general shortage of amphibious ships<sup>2</sup> and the absence of any necessity to deploy large numbers of Marines on amphibious shipping still presented few opportunities for Marines to gain such experience.<sup>3</sup>

Recognizing this shortfall, the Corps' leadership initiated efforts in 2019 to reorient the service toward enabling and supporting the projection of naval power in heavily contested littoral environments with a particular focus on the Indo-Pacific region and China as the "pacing threat" against which Marine Corps capabilities are being assessed and modified.<sup>4</sup> This reorientation was much more

than a simple refocusing on amphibious operations. Following a comprehensive assessment of the operational challenges that the service's operating forces are most likely to face 10 to 15 years in the future, General David H. Berger, 38th Commandant of the Marine Corps, issued Force Design 2030 (FD 2030), his directive to the service to reorganize, re-equip, and retrain Marines in ways that will make them relevant and effective in the presumed operating environment of the next several years and into the 2030s.<sup>5</sup>

As necessary an effort as FD 2030 is, however, the force envisioned by the project is in the process of being made<sup>6</sup> and, although showing remarkable capability in exercises and deployments,<sup>7</sup> has not been proven in battle. Consequently, this *Index* can only assess the Corps that exists today, and our assessments of capacity, capability (modernity), and readiness therefore pertain to the Marine Corps' current status, not to what it might be in the future.

As of late March 2023, "more than 32,000 Marines [were] forward-deployed or stationed across 50 countries. There [were] also, on average, 102 Marine Corps fixed-wing aircraft (F-35, F/A-18, and KC-130J) forward-deployed or stationed overseas, a 22% increase since 2018."<sup>8</sup> Numerous experimentation and exercise events undertaken by the Corps during the preceding year, almost all of which were in operational settings rather than in stateside training environments, included elements of II Marine Expeditionary Force working with 6th Fleet to comprise a naval task force (TF 61.2) charged with developing improved capabilities to deal with crises in Europe, the Mediterranean, and northern Africa; a similar effort in the Indo-Pacific (TF 76.3) involving units from 3rd Marine Expeditionary Brigade and ships from 7th Fleet; and using the USS *Tripoli*

(LHA-7) as an independent platform to expand its utility in responding with air, ground, and communications capabilities that are useful across a range of potential crises.<sup>9</sup> As noted by General Berger, these at-sea evolutions also revealed just how few Marines have the opportunity to gain deployed experience in maritime settings, partly because of the lack of readily available amphibious ships.<sup>10</sup>

The Marine Corps has always prized its crisis-response contributions to national security, and senior service leaders have emphasized this point consistently over the years. Maintaining this emphasis, General Berger made it central to the Corps' efforts to remain combat credible as adversary capabilities evolve, even at the expense of force capacity (the size of the service) and existing capabilities that, while still of value, were perceived as less relevant to the maritime environment of the Indo-Pacific.

Marine Corps leadership has emphasized that China serves as the pacing challenge for the Corps, which means that the military capabilities that China currently has and is developing, as well as the severity of the challenge presented by China, are a benchmark against which to measure "the level of capabilities that we will need in order to have a relative advantage now and into the future."<sup>11</sup> These capabilities will be applicable not only in a fight with China, but also in other scenarios and regions involving other enemies of lesser magnitude. In other words, if the Corps can develop tools, tactics, and skills that are effective against the capabilities China is developing, it will also be better equipped to deal with other opponents in other regions.

Service leadership is assuming that defense budgets will not see any appreciable growth in the next several years, so the Corps has retired or reduced assets and such capabilities as tanks, conventional tube artillery, heavy bridging, and some aircraft and has reduced manpower end strength to make related funding available for other purposes.

In general for the Joint Force, this *Index* focuses on the forces required to win two major wars as the baseline force-sizing metric for the Army, Navy, and Air Force, but it adopts a different paradigm—one war plus crisis response—for the Marine Corps. The three large services are sized for global action in more than one theater at a time; the Marines, by virtue of overall size and most recently by direction of the Commandant (and sustained at present by the

Assistant Commandant<sup>12</sup>), focus on one major conflict while ensuring that all Fleet Marine Forces are globally deployable for short-notice, smaller-scale actions. Marine Corps officials have emphasized that the results of the FD 2030 redesign will ensure that USMC forces are more capable and relevant in any fight, in any region, but the pacing challenge for Corps planners is China.<sup>13</sup>

In earlier editions of the *Index*, the capacity of the Marine Corps was assessed against a two-war requirement of 36 battalions: a historical average of 15 battalions for a major conflict (30 for two major conflicts) and a 20 percent buffer, bringing the total to 36. The Corps has consistently maintained that it is a one-war force and has no intention of growing to the size needed to fight two wars, and both its annual budget requests and its top-level planning documents reflect this position.

However, with China as the primary threat driving Marine Corps force planning and given China's extraordinary investment in modernizing its forces across all capabilities—including the expansion of various sensors, weapons, and platforms that are essential to the creation of an intensely weaponized, layered defense architecture—this *Index* cannot help but note that the Corps will need greater capacity if it is to succeed in war in the very circumstances for which the Marines believe they must prepare and with which this *Index* concurs.

## 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<sup>14</sup> and includes three rifle companies, a weapons company, and a headquarters and service company.<sup>15</sup>

The service has redesignated 3rd Marines, one of its infantry regiments, as 3rd Marine Littoral Regiment (MLR), a new organizational construct it is using to test ideas put forward in FD 2030.<sup>16</sup> Unlike a conventional Marine regiment, the MLR has a single Littoral Combat Team (LCT) based on an infantry battalion but also possessing an anti-ship missile battery, a Littoral Anti-Air Battalion, and a Combat Logistics Battalion. The LCT will focus on employment of platoons, which is radically different from a standard battalion's use of companies.<sup>17</sup>

While a bold move, 3rd MLR will serve as an operational test bed, deriving experience and insights that feed back into the FD 2030 effort. Being operationally employed as a full component of the Corps' operating forces, it is not a standard experimental organization, but because it has not yet been standardized across the Corps, it also cannot yet serve reliably as a reference by which to assess the Corps.

**Infantry.** A dozen years ago, the Marine Corps maintained 27 infantry battalions in its Active Component at an authorized end strength of 202,100.<sup>18</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 fiscal year (FY) 2015,<sup>19</sup> Congress began to fund gradual increases in end strength, returning the Corps to 24 infantry battalions. The deactivation of 3rd Battalion 8th Marines on May 18, 2021, and 2nd Battalion 3rd Marines on January 21, 2022,<sup>20</sup> left the Corps with 22 infantry battalions. Marine Corps leadership plans to stand down one more battalion, which will bring the number to 21.

There has been a consistent decline in the size of the Corps over the past few years. In FY 2022, the Corps operated with an end strength of 174,577 Marines. In FY 2023, it was funded for 177,000 but is projected to finish the year with 172,147. For FY 2024, the service has requested "\$15.6 billion for an active duty end strength of 172,300 Marines and \$904 million for 33,600 reservists aligned with Force Design decisions."<sup>21</sup>

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 the 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 the force, and any one of them can be a limiting factor in the conduct of training and operations.

**Aviation.** The Corps last published an update to its Aviation Plan (AVPLAN) on May 3, 2022.<sup>22</sup> The AVPLAN notes that several initiatives undertaken in 2014 have led to marked improvements in readiness with the Corps setting an objective of 75

percent aviation readiness for FY 2021. Since 2018, when readiness was 57 percent across all types of aircraft, the rate has increased by 9 percent to 66 percent in 2023 with a high of 68 percent in tactical aviation (F-35s and F/A-18s) and MV-22 readiness "rising from 52% in 2018 to 64% in 2023."<sup>23</sup>

Manning, however, remains a problem for both manned and unmanned aircraft. In 2018, according to General Berger, the Corps "had 88 of the 203 required F-35 pilots (43% of the requirement). At the end of 2022, we had 218 of 498 F-35 pilots (44% of the requirement). At the end of 2022, we had 200 F-35 pilots in flight school and another 62 at our fleet replacement squadrons with FY23 and FY24 completion dates."<sup>24</sup> Today, "half of our total inventory of UAS officers (72 of 148) are not yet trained and qualified to operate the MQ-9."<sup>25</sup>

The Corps maintains 17 squadrons of fixed-wing fighter/attack aircraft in its Active Component, and almost half are equipped with the F-35.<sup>26</sup> The Corps fielded approximately 28 squadrons during Desert Storm.<sup>27</sup> The reduction corresponds with the general shrinking of the U.S. military since the end of the Cold War but is also a consequence of budget restrictions caused by the Budget Control Act of 2011,<sup>28</sup> the costs of operations over the past 20 years without a corresponding increase in funding, and budget ceilings imposed by the White House and Congress. The reorientation of Marine Aviation in its capacity, type of aircraft, and balance among the various platforms is dictated by FD 2030, which itself is informed by both budget and operational threat realities.

Although the Corps is introducing the F-35 platform into the fleet, F/A-18 Hornets will remain in the force until 2030.<sup>29</sup> This primary tactical aviation capability has to be managed carefully as it is no longer in production. Through various programs, the Marines have extended the service life of their F/A-18 fleet to 10,000 flight hours, making it possible to keep them in service until FY 2030.<sup>30</sup> A similar effort will keep the venerable AV-8B Harrier in use until FY 2027.<sup>31</sup> At present, the Marines have acquired 190 F-35B—the STOVL (Short Take-Off and Vertical Landing) variant of the Joint Strike Fighter (JSF)—and 19 F-35C (carrier capable) aircraft of a planned 353 F-35B and 67 F-35C models.<sup>32</sup> This has enabled the service to stand up 11 JSF squadrons: seven operational; two fleet replacement (used to train new pilots); one test for F-35Bs; and one operational F-35C squadron.<sup>33</sup>

In its heavy-lift rotary-wing fleet, the Corps began a reset of the CH-53E in 2016 to bridge the procurement gap between the CH-53E and the CH-53K King Stallion and aimed to “reset...the entire 143-aircraft fleet by FY20.”<sup>34</sup> However, reporting in 2020 indicated that the Corps was moving rather slowly in this effort, and it was only one-third of the way through the process toward the close of the fiscal year.<sup>35</sup> Even when the reset is complete, the service will still be 57 aircraft short of the stated heavy-lift requirement of 200 airframes and will not have enough helicopters to meet its heavy-lift requirement without the transition to the CH-53K.<sup>36</sup>

The Corps has reported that the CH-53K heavy-lift helicopter has achieved initial operational capability (IOC),<sup>37</sup> opening the door for full production of operational units. The service procured 29 aircraft through FY 2021, 11 in FY 2022, and 12 in FY 2023 and has requested 15 for FY 2024.<sup>38</sup> Ultimately, it plans to acquire 196 operational aircraft that will equip five active squadrons by FY 2029 and a reserve squadron by FY 2030.<sup>39</sup>

As part of its ongoing search for improvements in its MV-22B Osprey, the Corps has tested a version of an electronic warfare radar jamming pod that it uses on other aircraft.<sup>40</sup> In the absence of conventional pylons on which weapons and sensors can be mounted, new capabilities have to be reconfigured to fit inside the aircraft or mounted on the aircraft fuselage.

The Marines have divested two MV-22 squadrons, standing down VMM-264 in FY 2020 and VMM-166 in FY 2021. The Corps’ 2022 AVPLAN still shows the service’s intent to stand down a third squadron by the start of FY 2024, although no action appeared to have been taken as of the time this edition of the *Index* was being prepared. FD 2030 originally proposed reducing the number of MV-22 squadrons to 14, but subsequent experimentation led the Commandant to revise his direction to specify retaining 16 squadrons in the Active force while reducing the number of aircraft per squadron from 12 to 10.<sup>41</sup>

Notably, the Corps has moved aggressively to implement aviation-related actions specified or implied by FD 2030. In May 2021, it disestablished HMLA-367, a light-attack helicopter squadron in Hawaii, sending its still relatively new attack and utility helicopters to Davis–Monthan Airbase in Arizona where they will be placed in the “boneyard”

for possible use in the future. The 27 AH-1Z Viper attack helicopters and 26 UH-1Y Venom utility helicopters that were decommissioned represented approximately one-fifth of the Marine Corps’ inventory of such aircraft.<sup>42</sup> In December 2022, HMLA-367 was reactivated while HMLA-469 was stood down.<sup>43</sup> Earlier that month, HMLA-269 was also disestablished,<sup>44</sup> leaving the Corps with five light/attack helicopter squadrons.

The Corps is also reducing the number of its heavy-lift squadrons of CH-53s. It deactivated HMM-366 in December 2022,<sup>45</sup> deactivated HMM-463 in April 2022,<sup>46</sup> and plans to deactivate one more by FY 2024,<sup>47</sup> leaving five heavy-lift helicopter squadrons in the Active Component to transition to the CH-53K.

**Amphibious Ships.** Amphibious ships, although driven by the Corps’ articulation of what it needs to execute its operational concepts, remain a Navy responsibility. Various documents describe the rationale for and nature of the Marine Corps’ thinking about how it plans to contribute to the projection of naval power in highly contested environments such as that found in the Indo-Pacific region if the U.S. were to find itself at war with China. The Corps’ most recent update to its Force Design 2030 efforts, for example, says that:

Warfighting concepts serve as the foundation for our modernization work. Most recently, we added *Global Positioning Network to Distributed Maritime Operations, Littoral Operations in a Contested Environment, Tentative Manual for Expeditionary Advanced Base Operations, A Concept for Stand-in Forces, and Reconnaissance and Counter-Reconnaissance*. To ensure our amphibious operations concepts remain current, together with the Navy, we are also developing a new concept for *21st Century Amphibious Operations*. It will describe how we will execute amphibious operations against future adversaries in this evolving and complex operational environment. It will also articulate the future role of amphibious operations in support of maritime campaigns and will describe new operating methods that incorporate agile platforms to supplement traditional amphibious ships. Examples include long-range, unmanned systems that infiltrate the adversary’s weapon engagement

zone; dispersed formations of manned and unmanned ships that challenge adversary targeting; and the adoption of disruptive technologies.<sup>48</sup>

These documents inform and reinforce Marine Corps and Navy plans to develop and acquire upwards of 35 small amphibious warships—Medium Landing Ship (LSM), previously known as the Light Amphibious Warship (LAWs), new amphibious vessels that would be smaller than those constituting the current fleet and optimized to support naval operations in the contested environments envisioned by Littoral Operations in a Contested Environment (LOCE) and Expeditionary Advance Base Operations (EABO).<sup>49</sup> LSMs would augment the Navy's current fleet of large amphibious warships, the number of which has been a matter of contention between the Navy and the Marine Corps, driven largely by the amount of funding that is available for shipbuilding.

The Marine Corps held 38 amphibious ships as the minimum requirement for many years but stepped away from that as a prelude to redefining its amphibious operations capabilities.<sup>50</sup> Now the Corps is making the case for 31 traditional amphibious ships as the bare minimum needed to execute operations as envisioned in FD 2030, augmented by LSMs.<sup>51</sup> Five companies have been awarded contracts for further concept development of LSMs,<sup>52</sup> but procurement of the first ship has been delayed until FY 2025.<sup>53</sup> Meanwhile, the number of traditional amphibious ships stood at 31 as of August 2023, down one ship from the same time last year.<sup>54</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, although 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, as

indicated in the preceding section on capacity, and is covered in the Navy's section of the *Index*. The Marine Corps is four years into a force-wide redesign per FD 2030 with modernization (introducing new weapons and platforms) and divestiture (retiring less relevant counterparts) programs shaped accordingly.

During General Berger's tenure as Commandant, the Corps emphasized that force redesign initiatives were self-funded, meaning that the service had divested itself of some capabilities that were less relevant to expected operational demands and had reduced manpower to redirect that funding to other priorities of greater relevance. In FY 2023, General Berger told Congress that the Corps' ability to maintain such self-funding had been exhausted, and the service would therefore need continued congressional support to sustain FD 2030 initiatives.<sup>55</sup>

Nevertheless, defense funding has not kept pace with inflation, and there are some things for which the Corps needs additional money. On June 15, 2021, for example:

Making his case before the House Armed Services Committee...for the Marine Corps' \$47.86 billion [FY 2022] budget request, Berger said he has reduced headquarters staffing by 15%, cut legacy systems and end strength, and has nothing left to draw from to fund programs and projects.

"We have wrung just about everything we can out of the Marine Corps internally," Berger said. "We're at the limits of what I can do."

The Marine Corps' budget request represents a 6.2% increase from fiscal 2021, even as the service plans to reduce the size of the active-duty force by 2,700, to 178,500 Marines. The service ultimately wants to reach 174,000 by 2030—roughly the size it was in fiscal 2002.

Berger is using the money he has saved by reorganizing the Marine Corps and shedding capabilities such as tanks and artillery to invest in new technologies and platforms.<sup>56</sup>

Programs such as the Amphibious Combat Vehicle (ACV), F-35, CH-53K, Naval Strike Missile, and Light Amphibious Warship continue to top the list

of major equipment and weapons, but the Corps is also pursuing a variety of unmanned systems (air, ground, and sea) and has placed great emphasis on smaller pieces of gear and individual-level weapons that will enable tactical units to be more effective.<sup>57</sup> These latter items are typically small in cost when compared with aircraft and armored vehicles, but they can have a decisive effect when employed in small-unit actions in the field.<sup>58</sup>

**Vehicles.** 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 more than 50 years old and the LAV averaging 40 years old.<sup>59</sup> The Corps invested in upgrades to the AAV over many years but stepped back from such efforts in 2018 as the ACV program bore fruit. In 2020, the Corps justified this as an acceptable near-term risk:

[W]e continue to make strategic choices in the divestiture of certain programs to reallocate funds toward building a more lethal, modern, multi-domain, expeditionary force. This has included accepting near-term capacity risk by reducing depot level maintenance for the legacy Amphibious Assault Vehicle (AAV) as we transition to the Amphibious Combat Vehicle (ACV).<sup>60</sup>

The Marine Corps has also been exploring options to replace its aged LAV with a collection of vehicles under the Advanced Reconnaissance Vehicle (ARV) program.<sup>61</sup> It requested \$63.585 million in its FY 2024 budget submission, on top of \$134 million spent in preceding years (including \$70.583 million in FY 2023),<sup>62</sup> for continued research and design work. According to the Navy's FY 2024 budget justification:

[The ARV] is imperative to realizing Marine Corps requirements for Fleet Marine Force 2030 as the platform that enables the Mobile Reconnaissance Battalion. As part of the portfolio of reconnaissance, surveillance, and target acquisition systems, ARV will be a purpose-built combat vehicle system, highly mobile on land and water, that can sense, communicate, and fight as the manned hub of a robotic and autonomous systems-enhanced

team. Equipped with modern command, control, communications and surveillance systems the ARV will transform the ability of Fleet Marine Forces to sense and communicate within the littoral operating environment by providing a persistent and mobile Systems of Systems to augment and sustain effective sensor webs and kill chains. The ARV is critical towards the modernization of Marine Corps reconnaissance capability.<sup>63</sup>

Once prototyping has been completed, and assuming the Corps decides to proceed, the next steps are “a Milestone B decision point in FY 2025” and a period of “competition leading to Milestone C in FY 2028.” It is expected that initial operational capability will be reached in FY 2030 and that full operational capability of the initial variant will be achieved in FY 2033.<sup>64</sup> In January 2023, the service began its testing of three competing prototypes with the evaluation to conclude before the end of the fiscal year.<sup>65</sup>

On July 30, 2020, an AAV sank off the California coast near San Clemente Island, claiming the lives of eight Marines and one sailor.<sup>66</sup> This led to the halting of all AAV operations until various investigations were completed and the Corps could install supplementary emergency breathing devices in the vehicle and take other steps to improve its safety and survivability.<sup>67</sup> AAV operations were resumed in April 2021 following inspection and modification of vehicles and related training and certification of AAV crews on the improvements.<sup>68</sup>

Nine months later, however, the Corps permanently restricted water operations for the AAV, effectively making it a land-only armored vehicle.<sup>69</sup> “[G]iven] the current state of the amphibious vehicle program,” according to a statement issued by the Corps:

[T]he Commandant of the Marine Corps has decided the AAV will no longer serve as part of regularly scheduled deployments or train in the water during military exercises; AAVs will only return to operating in the water if needed for crisis response. This decision was made in the interest of the long-term health of the amphibious vehicle programs and future capabilities. The AAV will continue to operate on land; 76 percent of its tasks are land-based. In



doing so, we reserve the capability to reverse this decision should the need arise.<sup>70</sup>

Recognizing the problems of its AAV fleet and the urgent need to update with a view to capabilities in line with FD 2030, the Corps accelerated procurement of the ACV. It procured 83 in FY 2022, procured another 74 in FY 2023, and has requested funding for 80 in FY 2024.<sup>71</sup> Combined with the 184 vehicles acquired in previous years, the additions bring the number of ACVs in the Corps' inventory to 341 out of a total program objective of 632.<sup>72</sup>

Acquisition of the Joint Light Tactical Vehicle (JLTV) is steady, although both the number of vehicles acquired in FY 2023 (384) and the number requested for FY 2024 (396) are less than half the number purchased in FY 2022 (837). Since 2017, when fielding of the HMMWV replacement began, the Marines have acquired 5,752 vehicles, and budget documents show plans for the Corps to purchase an additional 3,701 vehicles from FY 2025 through FY 2028.<sup>73</sup> The acquisition objective for the JLTV has varied over the years from 5,500 to just over 9,000.<sup>74</sup> Representatives from Marine Corps Systems Command have reported that the objective has been revised again to have the JLTV be a one-for-one replacement for all of the almost 11,000 HMMWVs currently in the inventory.<sup>75</sup>

**Aircraft.** Fixed-wing fighter-attack aircraft—specifically the AV-8B Harrier and F/A-18 Hornet—continue to age while the Corps pursues delivery of replacement aircraft: the F-35B STOVL variant to replace the AV-8B, in service since 1985, and the F-35C to replace its carrier-capable F/A-18s. To account for a lengthy transition period, the Corps has undertaken various efforts to extend the service life of its Hornets and Harriers to keep them in service until the end of the decade and, to meet the need to train new pilots even as the service retires the aircraft the pilots will fly, has taken such steps as folding the responsibilities of a formal training squadron into an operational unit.<sup>76</sup>

The Corps has acquired 190 of the 353 F-35B aircraft that it plans to purchase and 19 of the 67 F-35Cs, the version designed for use aboard aircraft carriers.<sup>77</sup> Though the F-35 program has been the subject of criticism ever since it began, much of this criticism is misplaced today given the steady decrease in cost per unit and the superior capabilities the aircraft brings to air operations in heavily

contested environments featuring peer-level enemies.<sup>78</sup> “As the Commander of United States Indo-Pacific Command (USINDOPACOM) recently noted during testimony,” according to General Berger, “The importance of the F-35 cannot be overstated.”<sup>79</sup> Additionally, not only is the F-35 “the most advanced fighter, strike, and sensor platform in the world,” but “aircraft like the F-35B provide combatant commanders a competitive warfighting advantage,” and the Corps “remains focused on accelerated transition to an all F-35 tactical aviation (TACAIR) fleet in order to stay in front of our pacing challenge.”<sup>80</sup>

The Corps' current concerns about the aircraft have less to do with its capabilities than they do with the overall cost of modern aircraft in general in the constrained budget environment within which the service is working to redesign its force and its ability to retain a sufficient number of pilots for the aircraft it is buying. As shared by General Berger:

As the head of personnel for the Air Force stated during testimony in 2017, we cannot compete with the airlines. We could not then and we cannot now. This is an issue that requires your oversight. We are at a competitive disadvantage and risk our reservoir of pilots drying up. As an example, in 2018, the Marine Corps had 88 of the 203 required F-35 pilots (43% of the requirement). At the end of 2022, we had 218 of 498 F-35 pilots (44% of the requirement). At the end of 2022, we had 200 F-35 pilots in flight school and another 62 at our fleet replacement squadrons with FY23 and FY24 completion dates. We are making some progress, but not enough—and certainly not quickly enough. We are exploring various options for structuring aviation bonuses and aviation incentive pay under the new authorities granted in the FY23 NDAA. But ever-larger monetary incentives are neither sustainable nor the appropriate remedy. This is not just a Marine Corps problem. It is a joint force problem, and we will continue to work with the other services and Congress as our understanding of this issue develops.<sup>81</sup>

Today, the USMC MV-22 Osprey program is operating with few problems and has completed the MV-22's full acquisition objective of 360.<sup>82</sup>

The MV-22's capabilities are in high demand from the Combatant Commanders (COCOMS), and the Corps is adding such capabilities as fuel delivery, the use of precision-guided munitions, digital interoperability with other platforms, and an improved ability to land in poor-visibility conditions to the MV-22 to enhance its value to the COCOMs.<sup>83</sup>

The USMC's heavy-lift replacement program, the CH-53K, conducted its first flight on October 27, 2015.<sup>84</sup> The CH-53K will replace the Corps' CH-53E, which is now more than 30 years old. Although "unexpected redesigns to critical components" delayed a low-rate initial production decision,<sup>85</sup> the program achieved Milestone C in April 2017. The Corps has purchased 52 aircraft so far and is requesting 15 in FY 2024, against a total acquisition objective of 196.<sup>86</sup>

## Readiness

Riding alongside the Marine Corps' principal Title 10 responsibility to provide "fleet marine forces... for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign"<sup>87</sup> is its contribution as the military's crisis-response force. This aspect of the Corps' contributions to national defense has been reinforced by service leaders who take pains to allay concerns that their focus on China and the Indo-Pacific will distract them from this important role.<sup>88</sup> The Corps' readiness must therefore account for both high-end conflict against a major opponent in the most complex operational settings and pop-up crises against lesser opponents that cannot be predicted, all of which implies a force that is ready to go at a moment's notice.

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>89</sup>

To this General Berger added an expanded perspective that includes force modernization as an essential element to ensure that combat forces remain relevant and therefore ready. As he and Air Force Chief of Staff General Charles Q. Brown, Jr., have argued, only by divesting old capabilities that would not be useful in changed circumstances and investing in new capabilities that account for more capable enemies and the characteristics of key operational theaters can U.S. forces be ready. "To do this," however, "we cannot let our focus on near-term availability consume the resources necessary to generate truly relevant future readiness through adaptive modernization."<sup>90</sup>

Divestiture carries with it some risk unless replacement capabilities are brought into the force as old or legacy capabilities are retired. For example, the Marine Corps' decision to get rid of tanks and a large percentage of its tube artillery means that the service will not have these capabilities should it be called into battle before new items can be fielded in meaningful numbers. Early reports of promising replacement capabilities to compensate for the loss of the Abrams main battle tank, for example, are encouraging, but the Corps now no longer has tanks while the improved replacement remains to be fielded.<sup>91</sup> This has a bearing on readiness to the extent that the force has a *current* ability to win in combat. The force might be ready but in a different posture. For a few years, the Marines could be more light-infantry than the middle-weight "two-fisted fighter" proudly described by a former Commandant a decade ago.<sup>92</sup>

Unfortunately for this *Index*, the Corps reports its current readiness in vague, generalized terms instead of providing data that external audiences could use to form their own conclusions with respect to this important question. It should be noted, however, that this approach is generally used by all of the services: Detailed readiness reports are classified to prevent potential enemies from obtaining sensitive information.

In the past, the services' leaders would report to Congress in formal testimony the various percentages of key equipment that were or were not available, share the status of primary units or types of force capabilities, and perhaps provide insight into maintenance or supply backlogs. The absence of such details from Marine Corps statements during the past few years reveals that the Corps prefers

not to share such information, at least currently. Corps officials have shared very encouraging anecdotal reports of lessons being learned in force-on-force exercises and the testing of new equipment and weapons that appear to validate the direction and objectives of FD 2030, but our assessment of the Corps' readiness must rely on the tone of statements and discussions, inferences derived from the totality of efforts and programs, and the sense one gets from anecdotal evidence of the seriousness with which the service is preparing for current and future employment.

As mentioned, the Marine Corps has undertaken a great reorientation to ready itself for war not just against China, but against any adversary that has the ability to field modern weapons and sensors in a heavily contested maritime environment. The service believes that the changes it is pursuing to this end will be relevant and necessary for combat environments outside of the Indo-Pacific as well, because many countries are acquiring capabilities that are now possible and affordable with modern technologies.<sup>93</sup> With this as the driver, combined with the reiteration of the Corps' role as a force in readiness, the service's words, actions, and policies strongly reinforce a focused commitment to combat readiness and rapid progress<sup>94</sup> in realizing the goals of its great reorientation.<sup>95</sup>

To improve force capabilities from the level of the individual to the most senior operational commands, the service is pushing several initiatives. Among them:

- The Marine Corps School of Infantry has revamped its training for entry-level infantry Marines, extending the eight-week course to 14 weeks and including new coursework and field training intended to sharpen the thinking skills of Marines who will likely find themselves operating more independently than has been the case in the past.<sup>96</sup>
- “In May [2021], the Marine Corps broke ground on a new, state-of-the-art wargaming facility intended to house various capabilities to enhance warfighter preparedness.” The Corps intends that the center, planned for use as early as 2024, will “help Marines better visualize the threat environment” and participate in war games of various sizes with a focus on

realism and that it will also “provide data to inform decisions affecting force development [and] support existing and developing weapons platforms and capabilities in all regions of the globe.”<sup>97</sup>

- Taking this emphasis on thinking, training, and war-gaming scenarios to the field, the Corps and the Navy teamed to execute a two-week Large Scale Exercise 2021—billed as the largest the services have conducted in many years—that involved 25,000 personnel, 36 live units, 50 virtual units, and a half-dozen major commands spread across 17 time zones.<sup>98</sup> LSE 2021 was followed in August 2023 by LSE 2023, which involved 10,000 personnel, “six Navy and Marine Corps component commands and seven U.S. numbered Fleets around the globe” across 22 time zones.<sup>99</sup>
- On the landward side of testing new capabilities, the Marines have conducted a series of force-on-force exercises (free-play exercises employing units with the ability to respond creatively to events rather than being limited to scripted or controlled play); have deployed new force designs in novel ways; and have operationally proved the utility of new force packages in real-world settings, all of which has both validated the initial arguments framing FD 2030 and driven adjustments to the effort.<sup>100</sup>
- The Corps has transitioned its 3rd Marine Regiment, based in Hawaii, into a new organizational construct reflecting FD 2030 initiatives. The 3rd Marine Littoral Regiment is serving as the tactical and operational test bed for the service's many initiatives.<sup>101</sup> This will be followed by the similar transition of 12th Marine Regiment, an artillery unit, into the 12th MLR sometime in FY 2025.<sup>102</sup>

Such efforts, from improvements to infantry training to war gaming to large exercises, are steps that appear to be having a positive effect on currently fielded forces. Although proof at scale has yet to be seen, they do reveal attitudes, priorities, and perspectives that reflect a level of seriousness about warfighting.

Within the Marine Corps, perhaps because it is a smaller service, changes in direction and attitude are conveyed to the force by senior leaders and adopted force-wide more easily than is the case in the larger services. While this does not directly replace hard data on mission-capable rates for equipment used by the Marines or cleanly substitute for unclassified reports about the readiness of units composing the Fleet Marine Force, it can be seen

as a surrogate for the Corps' attention to its level of readiness. The extended operational demands of Iraq and Afghanistan having concluded, the force is reconstituting its readiness as it reorients toward the requirements of FD 2030, LOCE, and EABO.

In the absence of any other direct reporting, this *Index's* assessment of the Corps' readiness for current operations is therefore an optimistic one.

## 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 major regional contingency (MRC).<sup>103</sup> This requirement is based on the presumption of a rather conventional force using known (current) equipment and capabilities against a similar opponent.

This *Index* acknowledges the service's work to develop new capabilities and approaches to fighting and is certainly aware of the trends in new technologies and associated thinking about how warfare *might* change in the future, but until this happens, one can assess only what can be known at present. Consequently, the Corps' historical need for 15 battalions (and associated enabling elements) for one major conflict translates to a force of approximately 30 battalions to fight two MRCs simultaneously according to the metric used in previous editions of the *Index*. The government force-sizing documents that discuss Marine Corps composition support the larger measure. Though the documents that make such a recommendation count the Marines by divisions rather than 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. However, the Corps has repeatedly made the case that it is a one-war force that must also have the ability to serve as the nation's crisis-response force.<sup>104</sup> It has just as consistently resisted growing in end strength even during the years of high operational demand associated with peak activities in Operation Iraqi Freedom (Iraq) and Operation Enduring Freedom (Afghanistan). Most recently, General Berger has stated flatly that

the Corps will trade manpower for modernization and that he intends to shrink the Corps from its current 22 infantry battalions to 21 battalions both to free resources so that they can be applied to new formations and to maintain capability investments in other areas such as Marine Special Operations Command.<sup>105</sup>

Manpower is by far the biggest expense for the Marines. In the Corps' FY 2023 budget, the military personnel account was \$16.0 billion (an increase of \$500 million over FY 2022),<sup>106</sup> dwarfing both the \$10.254 billion allocated for operations and maintenance<sup>107</sup> and the \$3.67 billion allocated for the procurement of new equipment.<sup>108</sup> Nevertheless, the historical record with regard to the use of Marine Corps forces in major contingencies argues for the larger number. More than 33,000 Marines, for example, 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.

One could reasonably presume that in a war with China—a war in which the Marines would employ many small, highly distributed units—the demand for forces would be similar to the demand during these historical instances of Marine Corps employment. The pacing threat for the Corps is China, the archetype for countries developing new tools and operational concepts that will likely require distribution of the Marine Corps across a large, contested littoral battlespace. The Corps has been refining its sense of what these formations will require, but they have yet to be proven in operational employment at significant scale. Consequently, we can only assess the service's current status against

historical demand. Even a one-major-war Marine Corps should possess a larger end strength and more tactical units (infantry battalions as the surrogate measure for the total Corps) than it currently has, especially with the trend bending downward to even fewer units.

As a one-war force that also needs the ability to provide crisis-response forces, sustain operations in the face of combat losses, and sustain its support for efforts that are not USMC-specific such as its service component contribution to U.S. Special Operations Command, the Corps should have a minimum of 30 battalions.

- **One-MRC-Plus Level:** 30 battalions.
- **Actual 2023 Level:** 22 battalions.

The Corps is operating with 73 percent of the number of battalions it should have relative to the revised benchmark set by this *Index* and has stated its intent to shrink from its current 22 battalions to 21 battalions. Marine Corps capacity is therefore scored as “weak.” Reducing operational strength by another battalion would bring it down even more to just 70 percent of the strength it should have.

### Capability Score: Strong

The Corps receives scores of “marginal” for “Capability of Equipment,” “marginal” for “Age of Equipment,” “strong” for “Health of Modernization Programs,” and “very strong” for “Size of Modernization Program.” This *Index* recognizes that within the Capability and Age portfolios, the old equipment exists mostly in ground combat vehicles. The Marines have modernized their aviation assets almost completely and are moving aggressively to introduce new ground platforms like the ACV and JLTV to offset the deteriorating condition of the AAV and HMMWV fleets, respectively.

In the aggregate, the service’s aviation arm and its rapid introduction of new munitions, weapons, and a host of communications equipment, sensors, and unmanned platforms likely compensate for the aged AAV, HMMWV, and AV-8B Harriers, resulting in a score of “strong” for Marine Corps capability.

### Readiness Score: Strong

The Marine Corps has exhibited an especially focused and aggressive commitment to ensuring that

its forces are ready for action. This is the point of FD 2030. However, the history of military services is littered with the debris of grand vision statements and futuristic concepts that were unrealized in practical implementation.

That the Marine Corps’ effort is substantially different from those of other services in the past is evidenced by irrevocable decisions to cashier old equipment and implement significant changes in education and training programs, dramatic investments in experimentation and war gaming, rapid acquisition of new capabilities, and profound redesign of operational units. The real changes in programs and organizations that reflect its published rhetoric are compelling evidence that the Corps means what it has been saying about maintaining readiness. The authors of the *2024 Index* believe it to be a low-risk proposition to apply the evidence of preparing for the future to current forces in terms of their focus on readiness for combat. The force remains encumbered by old primary equipment, but its effort to spend the money needed to keep it serviceable mitigates this problem to a reasonable extent.

The Corps is still too small, but the force it has is fully focused on warfighting. Consequently, the *2024 Index* assesses Marine Corps readiness as “strong,” continuing the assessment reached in the *2023 Index*.

### Overall U.S. Marine Corps Score: Strong

The score for the Marine Corps was raised to “strong” from “marginal” in the *2022 Index* and remains “strong” in this edition for two reasons: because the *2021 Index* lowered the threshold for capacity from 36 infantry battalions to 30 battalions in acknowledgment of the Corps’ argument that it is a one-war force that also stands ready for a broad range of smaller crisis-response tasks and because of the Corps’ extraordinary, sustained efforts to modernize (which improves capability) and enhance its readiness during the assessed year.

Of the five services, the Marine Corps is the only one that has a compelling story for change, has a credible and practical plan for change, and is effectively implementing its plan to change. However, in the absence of additional funding in FY 2024, if the Corps retains its intention to reduce the number of its battalions from 22 to 21, this reduction, if implemented, will limit the extent to which it can conduct distributed operations as it envisions and

replace combat losses (thus limiting its ability to sustain operations).

Though the service remains hampered by old equipment in some areas, it has nearly completed modernization of its entire aviation component, is making good progress in fielding a new Amphibious Combat Vehicle, is fast-tracking the acquisition of

new anti-ship and anti-air weapons, and is aggressively leveraging developments in unmanned systems and advanced computing and communication technologies. Full realization of its redesign plan will require the acquisition of a new class of amphibious ships, for which the Corps needs support from the Navy.

## 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 2023  
■ Pending

## Light Wheeled Vehicle

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>HMMWV</b></p> <p>Inventory: <b>10,607</b><br/>Fleet age: <b>25</b> Date: <b>1983</b></p> <p>The HMMWV, commonly known as the “Humvee,” is a light wheeled vehicle used to transport troops and various weapons systems. It provides some protection against small arms fire, fragmentation, and blast damage. Initially introduced in the 1980s and significantly upgraded in the early 2000s, HMMWVs are being replaced by the Joint Light Tactical Vehicle (JLTV).</p>                          | 2         | 2                | <p><b>Joint Light Tactical Vehicle (JLTV)</b></p> <p>Timeline: <b>2017-TBD</b></p> <p>The JLTV program is a joint program with the Army, meant eventually to replace all HMMWVs. Full-rate production was achieved in FY 2019. The first set of JLTVs were fielded in March 2019; initial operational capability (IOC) was achieved in mid-summer 2019.</p> | 5          | 5            |
| <p><b>JLTV</b></p> <p>Inventory: <b>3,626</b><br/>Fleet age: <b>3</b> Date: <b>2019</b></p> <p>The Joint Light Tactical Vehicle (JLTV) is replacing the HMMWV as a light wheeled vehicle for troop transport. The vehicle provides stronger protection from IEDs and threats with which the Humvee struggled during the conflicts in Iraq and Afghanistan. The JLTV improves reliability, survivability, and transportability while retaining the capability to be outfitted for specific missions.</p> | 5         | 5                | <p><b>PROCUREMENT</b></p> <p>5,752 4,097</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$2,465 \$3,512</p>  |            |              |

**NOTE:** See page 532 for details on fleet ages, dates, timelines, and procurement spending. JLTV spending figures reflect the full joint program spending

# MARINE CORPS SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Amphibious Assault Vehicle

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|---|-----------|------------------|--|------------|--------------|
| <p><b>AAV</b></p> <p>Inventory: <b>417</b><br/>Fleet age: <b>51</b> Date: <b>1972</b></p> <p>The Amphibious Assault Vehicle (AAV) is an amphibious landing vehicle that is designed to transport Marines from vessels at sea to shore. Though old, the AAV has received numerous upgrades over the years to keep it viable for land combat operations. In 2021, the decision was made to restrict AAVs from amphibious operations because of their age and reduced reliability during water operations. The AAV is being replaced by the Amphibious Combat Vehicle (ACV).</p> | 1         | 1                | <p><b>Amphibious Combat Vehicle (ACV)</b></p> <p>Timeline: <b>2018–2026</b></p> <p>The ACV is replacing the aged AAV. It achieved IOC in November 2020, and full-rate production was ordered in December 2020. In 2022, two ACVs were involved in operational mishaps, and the Marines decided to limit certain ACV amphibious operations until handling characteristics are better understood and operator skills are improved. An improved training program began to graduate students in July 2023.</p> | 4          | 4            |
| <p><b>LAV-25</b></p> <p>Inventory: <b>298</b><br/>Fleet age: <b>38</b> Date: <b>1983</b></p> <p>The Light Armored Vehicle (LAV) is an eight-wheeled armored reconnaissance vehicle. It is designed for off-road and moderate amphibious capabilities. This allows for highly mobile fire support in most terrains. The LAV will be in service until 2035.</p>   |           |                  | <p><b>PROCUREMENT</b>                      <b>SPENDING (\$ millions)</b></p> <table border="0"> <tr> <td style="width: 50%; text-align: center;"> </td> <td style="width: 50%; text-align: center;"> </td> </tr> </table>  |            |              |
|   |           |                  |  |            |              |

## Attack Helicopters

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>AH-1Z Viper</b></p> <p>Inventory: <b>134</b><br/>Fleet age: <b>12</b> Date: <b>2010</b></p> <p>The AH-1Z Viper is the Marine Corps' attack helicopter. The Viper has greater speed, payload, and range, as well as upgraded landing gear, advanced weapons systems, and a fully integrated glass cockpit, compared to its predecessor, the AH-1W Super Cobra. The Viper provides Marines with close air support, armed escort/reconnaissance, and anti-armor capabilities. The Viper's expected operational life span is 30 years.</p> | 4         | 5                | None                |            |              |

**NOTE:** See page 532 for details on fleet ages, dates, timelines, and procurement spending.



# MARINE CORPS SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Tactical Aircraft

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>AV-8B</b></p> <p>Inventory: <b>53</b><br/>Fleet age: <b>31</b> Date: <b>1985</b></p> <p>The Harrier is the Marine Corps' ground attack aircraft. It is a subsonic jet capable of hovering as a helicopter hovers. The Harrier has a Vertical/Short Take-Off and Landing (V/STOL) system that is designed to fly from amphibious assault ships and unconventional runways. These unique capabilities allow it to operate in a variety of environments that other jets find inaccessible. The aircraft is being replaced by the F-35B and will be fully retired around 2025.</p>   | 1         | 1                | <p><b>F-35B/C</b></p> <p>Timeline: <b>2007-2029</b></p> <p>The F-35B (STOVL Variant) is replacing the AV-8B Harrier, providing the Corps with a fifth-generation stealth STOVL aircraft. Specifically designed for the Marine Corps, the B-model achieved IOC in 2015. It is being procured at a much higher quantity than the C-model, and full operational capability is expected in the late 2020s. The F-35C (Carrier Variant) is also being procured by the Marine Corps, replacing the F/A-18. Designed for operations by aircraft carrier, the F-35C is being procured to give Marines the ability to launch from carriers while the F-35B launches from amphibious assault ships. The Marines activated their first F-35C squadron in December 2020. Full operational capability is expected in the late 2020s.</p> | 5          | 4            |
| <p><b>F/A-18 C-D</b></p> <p>Inventory: <b>213</b><br/>Fleet age: <b>32</b> Date: <b>1978</b></p> <p>The F/A-18 C and D models are all-weather attack aircraft designed for interdiction and close air support. The C-version is a single seat aircraft, and the D-model is a two-seat aircraft that incorporates a Weapons and Sensors Officer who handles a broader range of weapons and expands the aircraft's ability to conduct night attack missions. The Corps will retire the aircraft as the F-35 B and C models are fully fielded, which should be around 2030.</p>   | 2         | 1                | <p><b>PROCUREMENT</b></p> <p>177 192</p> <p><b>SPENDING (\$ millions)</b></p> <p>\$27,122 \$26,407</p>  |            |              |
| <p><b>F-35B/C Lightning II</b></p> <p>Inventory: <b>145</b><br/>Fleet age: <b>4</b> Date: <b>2015</b></p> <p>The F-35B is the Marine Corps variant of the Joint Strike Fighter (JSF) Program. It is a fifth-generation, stealth multi-role fighter. Its next-generation technology allows it to dominate combat missions with greatly reduced risk of detection by the enemy. Unique to the other variants, the B-Model is designed with a Short Take-Off Vertical Landing (STOVL) system that allows for operation from short flight decks and unconventional runways. This combines the unique operational capabilities of the AV-8B Harrier with the new technology offered by the JSF program. The F-35C is the Navy's version of the JSF, built to conduct catapult-assisted takeoffs and cable-arrested landings on aircraft carriers. The Marine Corps operates a portion of its F-35 fleet to leverage carrier-based operations.</p> | 5         | 5                |   |            |              |

NOTE: See page 532 for details on fleet ages, dates, timelines, and procurement spending.

# MARINE CORPS SCORES

1 2 3 4 5  
Weakest ← Strongest

Procurement and Spending ■ Through FY 2023 ■ Pending

## Medium Lift

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM  | Size Score | Health Score |
|---|-----------|------------------|--|------------|--------------|
| <p><b>MV-22B Osprey</b></p> <p>Inventory: <b>273</b><br/>Fleet age: <b>9</b> Date: <b>2007</b></p> <p>The Osprey is a vertical takeoff, tilt-rotor aircraft that combines the vertical capabilities of a helicopter with those of a traditional fixed-wing aircraft, enabling the Osprey to fly much faster and farther than a helicopter. Similar to the AV-8B, this allows the aircraft to take off and land in environments where normal aircraft cannot go. The Osprey provides transport for personnel, cargo lift, and support for expeditionary assaults. The life expectancy of the MV-22B is 23 years.</p> | 3         | 5                | <p><b>MV-22B</b></p> <p>Timeline: <b>2007-TBD</b></p> <p>Fielding of the Osprey was completed in 2019 with the MV-22B replacing the CH-46E helicopter. Production was halted in FY 2023 once the Corps' full acquisition objective was reached.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>359 5 \$30,502 \$23,095</p> | 5          | 5            |

## Heavy Lift

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>CH-53E Super Stallion</b></p> <p>Inventory: <b>129</b><br/>Fleet age: <b>34</b> Date: <b>1981</b></p> <p>The CH-53E is a heavy-lift rotary-wing aircraft. The Super Stallion transports heavy equipment and supplies for amphibious assault operations and sustained operations ashore. Able to be aerial refueled, it can enable operations across vast distances. The aircraft will operate through 2025, to be replaced by the more advanced CH-53K.</p> | 5         | 1                | <p><b>CH-53K</b></p> <p>Timeline: <b>2017-2030</b></p> <p>The CH-53K King Stallion program is currently in full-rate production. It will replace the aging CH-53E and provide increased range, survivability, and payload. The King Stallion achieved IOC in April 2022 and is scheduled to deploy in 2024. It is on schedule to declare Full Operational Capability in FY 2029.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>40 156 \$6,397 \$18,428</p> | 5          | 3            |

## Tanker

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>KC-130J</b></p> <p>Inventory: <b>46</b><br/>Fleet age: <b>13</b> Date: <b>2005</b></p> <p>The KC-130J is a large multi-role aircraft that is used primarily as a tanker and cargo transport. It can be equipped for various missions including air-to-air refueling, reconnaissance, and medevac operations.</p> | 4         | 5                | <p><b>KC-130J</b></p> <p>Timeline: <b>2005-2024</b></p> <p>The KC-130J is both a tanker and a transport aircraft. The procurement program for the KC-130J is not facing acquisition problems. Procurement is planned to be complete by 2024.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>84 27 5,988 \$4,215</p> | 4          | 4            |

**NOTE:** See Methodology for descriptions of scores. Fleet age is the average between the last year of procurement and the first year of initial operational capability. The date is when the platform achieved initial operational capability. The timeline is from the start of the platform's program to its budgetary conclusion. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E). 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 that are included here. The MV-22B program also includes some costs from U.S. Air Force procurement. AH-1Z costs include costs of UH-1 procurement.

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12. Due to political circumstances beyond its control, the Marine Corps lost its Senate-confirmed head of service when General Berger retired on July 10, 2023, without the ability to "pass the colors" to his successor. Until he is confirmed by the Senate, General Berger's nominated successor, Assistant Commandant of the Marine Corps (ACMC) General Eric M. Smith, will serve as ACMC and "perform the duties of" Commandant. To ensure that the Corps is not somehow directionless, General Smith issued a White Letter to provide guidance to the force in lieu of a formal Commandant's Planning Guidance. See Matt Seyler, "Marine Corps Without Confirmed Commandant for 1st Time Since 1910 After GOP Senator's Blockade," ABC News, July 11, 2023, <https://abcnews.go.com/Politics/marine-corps-confirmed-commandant-1st-time-1910-due/story?id=101007971> (accessed August 29, 2023), and General Eric M. Smith, Assistant Commandant of the Marine Corps, White Letter 1-23, "Guidance to the Force," U.S. Marine Corps, August 1, 2023, <https://www.marines.mil/Guidance-To-The-Force/> (accessed August 29, 2023).
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14. Based on an ongoing series of experiments, it appears that the Corps will settle on an infantry battalion slightly larger than 800 Marines. See Berger, statement before House Armed Services Committee, April 28, 2023, p. 8.
15. To be clear, the Corps has thought of itself in terms of Marine Air Ground Task Forces (MAGTFs), a collection of ground, aviation, and logistics capabilities under a common commander, for nearly six decades, but because its size and composition vary by task, the MAGTF is not helpful as a consistent reference for capacity; thus, we use battalions as a measure that is generally understood by most students of military affairs. For an expanded discussion, see Dakota L. Wood, "Rebuilding America's Military: The United States Marine Corps," Heritage Foundation *Special Report* No. 211, March 21, 2019, pp. 15–16, <https://www.heritage.org/defense/report/rebuilding-americas-military-the-united-states-marine-corps>. With specific reference to its infantry battalions, the Corps is engaged in a fundamental redesign as a subcomponent of FD 2030, but until the reorganization effort is complete, the force that it would use in an emerging crisis for the foreseeable future will consist of the standard infantry battalions and supporting arms and units that it possesses today. For additional information, see U.S. Marine Corps, "2030 Infantry Battalions," August 2, 2021, <https://www.marines.mil/News/News-Display/Article/2708161/2030-infantry-battalions/> (accessed August 29, 2023).
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25. *Ibid.*
26. U.S. Marine Corps, *2022 United States Marine Corps Aviation Plan*, pp. 56 and 60.
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53. Ronald O'Rourke has tracked the evolution of the LAW, now LSM, in periodic Congressional Research Service reports. According to the most recent update, published on August 7, 2023, funding for initial concept designs was provided to 15 companies in July 2020 with a contract for the lead ship intended in FY 2022. In June 2021, new concept design awards were made to five companies. The Navy's FY 2024 budget request includes \$14.7 million for R&D funding. As reported by O'Rourke, the GAO has stated: "[The] Navy delayed the detail design and construction contract award for LAW from fiscal year 2023 to fiscal year 2025. According to Navy officials, this change was due to ongoing efforts to engage with industry and refine program requirements, as well as delays in gaining approval of the program's analysis of alternatives (AOA)—a key document to help DOD and the Navy decide if a new ship class is needed. As of January 2023, the Office of the Secretary of Defense had yet to approve the AOA, which is at least a 19-month delay in the planned approval since our last review." O'Rourke, "Navy Medium Landing Ship (LSM) (Previously Light Amphibious Warship [LAW]) Program: Background and Issues for Congress," pp. 14, 17, and 18.

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59. Private correspondence with the author, August 6, 2021.
60. U.S. Department of the Navy, Office of Budget-2020, *Highlights of the Department of the Navy FY 2021 Budget*, p. 3-14, [https://www.secnav.navy.mil/fmc/fmb/Documents/21pres/Highlights\\_book.pdf](https://www.secnav.navy.mil/fmc/fmb/Documents/21pres/Highlights_book.pdf) (accessed August 30, 2023).
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64. *Ibid.*, p. 659.
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74. Andrew Feickert, “Joint Light Tactical Vehicle: Background and Issues for Congress,” Congressional Research Service Report RS22942, updated July 13, 2020, p. 6, <https://crsreports.congress.gov/product/pdf/RS/RS22942> (accessed August 30, 2023).
75. Private correspondence with the author, July 19, 2022.
76. Statement of Lieutenant General Mark R. Wise, Deputy Commandant for Aviation, U.S. Marine Corps, in hearing, *Fiscal Year 2022 Budget Request of the Department of Defense for Fixed-Wing Tactical and Training Aircraft Programs*, Subcommittee on Tactical Air and Land Forces, Committee on Armed Services, U.S. House of Representatives, July 13, 2021, <https://www.govinfo.gov/content/pkg/CHRG-117hrg45620/html/CHRG-117hrg45620.htm> (accessed August 30, 2023), and Annette Weston, “Sun-down Ceremony for Harrier Training Squadron Marks End of Nearly 40-Year Era,” NewsChannel 12 [New Bern, North Carolina], October 27, 2021, <https://wcti12.com/news/local/sun-down-ceremony-for-harrier-training-squadron-marks-end-of-nearly-40-year-era> (accessed August 30, 2023).
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78. For an explanation of current F-35 cost and performance matters, see John Venable, “Swiss Government Purchase of F-35A Fighter Jet Reveals Critical Flaws in U.S. Air Force Decision to Buy F-15EX,” Heritage Foundation *Issue Brief* No. 5202, July 12, 2021, <https://www.heritage.org/sites/default/files/2021-07/IB5202.pdf>.
79. Berger statement, May 9, 2022.
80. *Ibid.*
81. Berger, statement before House Armed Services Committee, April 28, 2023, p. 4.
82. Exhibit P-40, “Budget Line Item Justification: PB 2024 Navy, Appropriation / Budget Activity / Budget Sub Activity: 1506N: Aircraft Procurement, Navy / BA 01: Combat Aircraft / BSA 1: Combat Aircraft, P-1 Line Item Number / Title: 0164 / V-22 (Medium Lift),” in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2024 Budget Estimates, Navy, Justification Book Volume 1 of 3, Aircraft Procurement, Navy, Budget Activities 01–04*, p. 85.
83. U.S. Marine Corps, *2022 United States Marine Corps Aviation Plan*, pp. 90, 96.

84. Vice Admiral Paul Grosklags, Representing Assistant Secretary of the Navy (Research, Development and Acquisition); Lieutenant General Jon Davis, Deputy Commandant for Aviation; and Rear Admiral Michael C. Manazir, Director Air Warfare, statement on “Department of the Navy’s Aviation Programs” before the Subcommittee on Seapower, Committee on Armed Services, U.S. Senate, April 20, 2016, p. 21, [http://www.armed-services.senate.gov/imo/media/doc/Grosklags-Davis-Manazir\\_04-20-16.pdf](http://www.armed-services.senate.gov/imo/media/doc/Grosklags-Davis-Manazir_04-20-16.pdf) (accessed August 30, 2023).
85. U.S. Government Accountability Office, *Defense Acquisitions: Assessments of Selected Weapons Programs*, GAO-16-329SP, March 2016, p. 93, <http://www.gao.gov/assets/680/676281.pdf> (accessed August 29, 2023).
86. Exhibit P-40, “Budget Line Item Justification: PB 2024 Navy, Appropriation / Budget Activity / Budget Sub Activity: 1506N: Aircraft Procurement, Navy / BA 01: Combat Aircraft / BSA 1: Combat Aircraft, P-1 Line Item Number / Title: 0158 / CH-53K (Heavy Lift),” in U.S. Department of the Navy, *Department of Defense Fiscal Year (FY) 2024 Budget Estimates, Navy, Justification Book Volume 1 of 3, Aircraft Procurement, Navy, Budget Activities 01-04*, p. 61.
87. 10 U.S. Code § 8063(a), <https://www.law.cornell.edu/uscode/text/10/8063> (accessed August 29, 2023).
88. Berger, statement before House Armed Services Committee, April 28, 2023, p. 36.
89. U.S. Marine Corps, *Commander’s Readiness Handbook*, May 2014, p. iv, <https://www.hqmc.marines.mil/Portals/138/HiRes%20Commanders%20Readiness%20Handbook.pdf> (accessed August 29, 2023). Italics in original.
90. General Charles Q. Brown, Jr., and General David H. Berger, “Redefine Readiness or Lose,” War on the Rocks, March 15, 2021, <https://warontherocks.com/2021/03/redefine-readiness-or-lose/> (accessed August 29, 2023).
91. “[Lieutenant General Eric] Smith used the anti-armor mission as an example of how the service [is] evolving. Before, the Marines would use their own tanks to target enemy tanks. Now, the service is divesting its entire fleet of tanks to free up money to invest in higher priorities. Instead, it can use long-range precision munitions launched from the back of a JLTV to destroy enemy tanks from a more mobile posture and from longer ranges. ‘The experimentation that we’ve done now to date successfully using lightweight mounted fires—think the back of a Joint Light Tactical Vehicle—is killing armor at ranges, rough calculation, about 15, 20 times the range that a main battle tank can kill another main battle tank,’ Smith said. He added the Marine Corps didn’t get rid of its tanks because they weren’t good at taking out adversary tanks, but rather ‘we can kill armor formations at longer ranges using additional and other resources without incurring a 74-ton challenge trying to get that to a shore, or to get it from the United States into the fight. You simply can’t be there in time.’” Megan Eckstein, “Early Experiments Are Proving out Tank-Free Marine Corps Concept,” U.S. Naval Institute News, February 10, 2021, <https://news.usni.org/2021/02/10/early-experiments-are-proving-out-tank-free-marine-corps-concept> (accessed August 30, 2023). General Berger has built on this point with his annual updates that report progress with FD 2030. For his most recent discussion of divestiture, replacement capabilities, and readiness, see Berger, “Force Design 2030 Annual Update,” May 2022, p. 16.
92. J.R. Wilson, “State of the Corps: The Final Interview with Gen. James T. Conway, Commandant of the Marine Corps,” Defense Media Network, October 24, 2010, <https://www.defensemedianetwork.com/stories/state-of-the-corps/> (accessed August 30, 2023).
93. The ongoing war in Ukraine is a ready example of how modern technologies, once unreachable because of cost, complexity, and rarity, are now ubiquitous and affordable and are being leveraged to support military operations at all levels of war. What was once the preserve of major states, advanced technologies can be adapted from the commercial market to great effect. For various examples, see Jason McGee-Abe, “One Year on: 10 Technologies Used in the War in Ukraine,” TechInformed, February 24, 2023, <https://techinformed.com/one-year-on-10-technologies-used-in-the-war-in-ukraine/> (accessed August 30, 2023); Robin Fontes and Jorrit Kamminga, “Ukraine a Living Lab for AI Warfare,” *National Defense*, March 24, 2023, <https://www.nationaldefensemagazine.org/articles/2023/3/24/ukraine-a-living-lab-for-ai-warfare> (accessed August 30, 2023), and Annika Burgess, “What Ukraine’s Weapons Innovation and Commercial Technologies Tell Us About the Future of War,” ABC [Australian Broadcasting Corporation] News, February 3, 2023, <https://www.abc.net.au/news/2023-02-04/diy-weapons-innovation-drones-in-ukraine-war-russia/101910506> (accessed August 30, 2023).
94. When questioned about Force Design 2030 initiatives during his confirmation hearing on his nomination to be 39th Commandant of the Marine Corps, Assistant Commandant General Eric Smith said, “So those efforts are on pace and need to go faster, because also as referenced from Ranking Member Wicker, whether the year is ’27, ’26, ’25, for the Marines, we are the fight tonight force. We want to be even more ready than we are every single day. That is our mission when we wake up. ♣ So, Force Design is on track. We need to accelerate those areas where we can...” See stenographic transcript of hearing *To Consider the Nomination of: General Eric M. Smith, USMC for Reappointment to the Grade of General and to be Commandant of the Marine Corps*, Committee on Armed Services, U.S. Senate, June 13, 2023, p. 22, [https://www.armed-services.senate.gov/imo/media/doc/transcript\\_61323.pdf](https://www.armed-services.senate.gov/imo/media/doc/transcript_61323.pdf) (accessed August 30, 2023).
95. See Berger, “Commandant’s Planning Guidance.”
96. See Sarah Cammarata, “Infantry Training More Intense as Marine Corps Makes Major Changes, Commandant Tells Senators,” *Stars and Stripes*, June 25, 2021, [https://www.stripes.com/branches/marine\\_corps/2021-06-24/Infantry-training-more-intense-as-Marines-Corps-makes-major-changes-commandant-tells-senators-1793441.html](https://www.stripes.com/branches/marine_corps/2021-06-24/Infantry-training-more-intense-as-Marines-Corps-makes-major-changes-commandant-tells-senators-1793441.html) (accessed August 30, 2023); Chad Garland, “Marine Corps Seeks to Make ‘Smarter’ Infantry Force with New Course,” *Stars and Stripes*, February 22, 2021, <https://www.stripes.com/theaters/us/marine-corps-seeks-to-make-smarter-infantry-force-with-new-course-1.663144> (accessed August 30, 2023); and Gidget Fuentes, “Marines Retooling Infantry Training for Complex Warfare in Pacific,” U.S. Naval Institute News, May 6, 2021, <https://news.usni.org/2021/05/06/marines-retooling-infantry-training-for-complex-warfare-in-pacific> (accessed August 30, 2023).
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99. U.S. Navy, U.S. Fleet Forces Command, "Navy and Marine Corps Commence Large Scale Exercise 2023," August 9, 2023, <https://www.usff.navy.mil/Press-Room/News-Stories/Article/3488030/navy-and-marine-corps-commence-large-scale-exercise-2023/> (accessed August 30, 2023).
100. Berger, Senate Armed Services Committee testimony, May 12, 2022, pp. 17–19.
101. U.S. Marine Corps, "Redesignated: 3rd Marine Regiment Becomes 3rd Marine Littoral Regiment."
102. Dzirhan Mahadzir, "New Marine Littoral Regiment Key to Expanded Pacific Security Cooperation, U.S., Japanese Leaders Say," U.S. Naval Institute News, January 12, 2023, <https://news.usni.org/2023/01/12/new-marine-littoral-regiment-key-to-expanded-pacific-security-cooperation-u-s-japanese-leaders-say> (accessed August 27, 2023).
103. This count is based on an average number of 1.5 divisions deployed to major wars (see Table 6, "Historical U.S. Force Allocation," in "An Assessment of U.S. Military Power," *supra*) and an average of 10–11 battalions per division.
104. General David H. Berger and Ryan Evans, "A Chat with the Commandant: Gen. David H. Berger on the Marine Corps' New Direction," *War on the Rocks*, April 6, 2020, <https://warontherocks.com/2020/04/a-chat-with-the-commandant-gen-david-h-berger-on-the-marine-corps-new-direction/> (accessed August 30, 2023), and General David H. Berger, Commandant of the Marine Corps, "The 38th Commandant's Intent," U.S. Marine Corps, July 17, 2019, <https://www.cmc.marines.mil/Priorities-Guidance-and-Concepts/Article/Article/2929844/the-38th-commandants-intent/> (accessed August 30, 2023).
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106. U.S. Department of the Navy, Office of Budget–2023, *Highlights of the Department of the Navy FY 2024 Budget*, DON Budget Card, [https://www.secnav.navy.mil/fmc/fmb/Documents/24pres/DON\\_Budget\\_Card.pdf](https://www.secnav.navy.mil/fmc/fmb/Documents/24pres/DON_Budget_Card.pdf) (accessed August 30, 2023).
107. *Ibid.*
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# U.S. Space Force

John Venable

The U.S. Space Force (USSF) was created pursuant to Title IX of the fiscal year (FY) 2020 National Defense Authorization Act (NDAA), which was signed into law on December 20, 2019.<sup>1</sup> It is “responsible for organizing, training, and equipping Guardians [military space professionals] to conduct global space operations that enhance the way our joint and coalition forces fight, while also offering decision makers military options to achieve national objectives.”<sup>2</sup>

Almost all civilian and commercial space technologies have direct applicability to military systems or are of dual use. This makes the interwoven efforts of all three U.S. sectors critical to any informed assessment of the Space Force.<sup>3</sup>

## Background

More than any other nation, America relies on the technological advantages of space. Banking, commerce, travel, entertainment, the functions of government, and our military all depend on our assets in space.<sup>4</sup> That fact has been recognized by every President since Dwight Eisenhower in the mid-1950s, but various issues kept the United States from developing a single service charged with managing space assets and capabilities until very recently.

In 1961, the Air Force was named executive agent for space research and development, but at that point, the Army and Navy already had well-established programs.<sup>5</sup> This splintered approach remained in place for the next six decades and, although anything but efficient, allowed the U.S. to advance its space capabilities at a stunning pace.

The effectiveness of the space support missions delivered during those developmental decades was on full display during Operation Desert Storm.<sup>6</sup> Our

space capabilities allowed our forces to move with incredible speed and accuracy, but a growing U.S. dependence on space was equally evident. U.S. reliance on the Global Positioning System (GPS) for air, land, and sea maneuver, targeting, and engagement has grown to the point where it is nearly universal, exposing a critical vulnerability that our adversaries have moved to exploit.

Both China and Russia have developed doctrine, organizations, and capabilities to challenge U.S. access to and operations in the space domain. Concurrently, their own use of space is expanding significantly. These nations have demonstrated the capability to put American space assets at risk, and until very recently, the United States had not taken overt steps to protect those systems, much less to develop its own warfighting capability in that domain.

The FY 2017 NDAA mandated that the Department of Defense (DOD) conduct a review of the organization and command and control of space assets within the department.<sup>7</sup> Shortly after the FY 2017 NDAA was enacted, President Donald Trump directed that a Space Force be established within the Department of the Air Force (DAF).<sup>8</sup> Congress concurred and created the USSF with enactment of the FY 2020 NDAA.

An important addition to the U.S. warfighting command structure was the reestablishment of U.S. Space Command in 2019 as the 11th Combatant Command within the Department of Defense. Space Command’s mission is to conduct “operations in, from, and to space to deter conflict, and if necessary, defeat aggression, deliver space combat power for the joint/combined force, and defend U.S. vital interests with allies and partners.”<sup>9</sup>

## Organization and Funding

The USSF Headquarters and Office of the Chief of Space Operations (CS) are located in the Pentagon. When Congress authorized the Space Force, it limited its scope to Air Force organizations and personnel located at five major installations:

- The 21st Space Wing at Peterson Air Force Base, Colorado;
- The 30th Space Wing at Vandenberg Air Force Base, California;
- The 45th Space Wing at Patrick Air Force Base, Florida;
- The 50th Space Wing at Schriever Air Force Base, Colorado; and
- The 460th Space Wing at Buckley Air Force Base, Colorado.<sup>10</sup>

Those personnel, organizations, and structures have been restructured and rolled into three major field commands that fall directly under the CSO:

- Space Operations Command (SpOC);
- Space Systems Command (SSC); and
- Space Training and Readiness Command (STARCOM).<sup>11</sup>

These three commands lead the next tier of organizations, called Deltas. The Space Force originally included “Garrisons” in the tier as Deltas but renamed them all Deltas in 2022.<sup>12</sup> Deltas are equivalent to Air Force Groups, are led by a colonel, and are tasked with and responsible for specific missions and operations or are organizations with functions similar to those of Air Force base-level command. Squadrons are the final level of command and fall under Deltas.<sup>13</sup>

**Space Operations Command.** SpOC was established at Peterson Air Force Base, Colorado, on October 22, 2020, as the first major USSF field command.<sup>14</sup> It is led by a three-star general and is responsible for organizing, training, and equipping space forces assigned to Combatant Commands. The SpOC at Vandenberg Air Force

Base, California, was redesignated as SpOC West and continues to conduct operations in support of Combatant Commanders.

**Space Systems Command.** This command stood up on August 13, 2021, at Los Angeles Air Force Base<sup>15</sup> to oversee the development, acquisition, and maintenance of satellites and ground systems, the procurement of satellite communications (SATCOM) and launch services, and investments in next-generation technologies. SSC is led by a three-star general who oversees the Space Force’s approximately \$19.2 billion FY 2024 budget for research, development, test, and evaluation (RDT&E) and the acquisition of new systems.<sup>16</sup> SSC absorbed the Space and Missile Systems Center (SMC), located at Los Angeles Air Force Base, California; the Commercial Satellite Communications Office based in Washington, D.C.;<sup>17</sup> and the Space Vehicles Directorate at Kirkland Air Force Base, New Mexico.<sup>18</sup>

In October 2022, the Space Development Agency (SDA) was transferred to the U.S. Space Force as a direct reporting unit. SDA is delivering on its strategy to design a proliferated constellation of small, low Earth orbit (LEO)–based satellites that can be fielded faster and more cheaply than large, geosynchronous orbit (GEO)–based satellites. In April 2023, SDA put the first 10 of 28 communications and space situational awareness satellites within the Proliferated Warfighter Space Architecture (PWSA) into orbit just 30 months after it was given authority to proceed with the contract.<sup>19</sup> Since then, 14 more PWSA satellites have been put into orbit.

**Space Training and Readiness Command.** STARCOM is the third USSF field organization and stood up on August 23, 2021, at what is now Peterson Space Force Base, Colorado. It is led by a two-star general and is responsible for the education and training of space professionals.<sup>20</sup>

**Personnel.** The FY 2024 Air Force budget request supports 9,400 military and 4,909 civilian Space Force personnel, respectively, up from 8,600 military and 4,714 civilian personnel in FY 2023, and a total end strength of 14,526, up from 13,527 in FY 2023.<sup>21</sup>

**Funding.** The President’s budget request for FY 2024 lays out a relatively robust level of funding for every aspect of the new service’s mission set. The budget for Operations and Maintenance (O&M) is \$4.9 billion; the budget for RDT&E is \$19.2

billion; and procurement adds another \$4.7 billion for a total of \$30.0 billion, a 14 percent increase from FY 2023.<sup>22</sup>

## Capacity

The classified nature of deployed space assets makes any listing of specific capacity levels within the Space Force portfolio or assessment of the service's capability to execute its mission a challenging exercise. The USSF's position, navigation, and timing (PNT); command and control (C2); communications (Comm); weather satellites; and intelligence, surveillance, and reconnaissance (ISR) satellites are unrivaled by our peer adversaries and provide extraordinary capabilities. The service's space situational awareness (SSA) satellites and terrestrial-based capabilities are also unrivaled, but they are limited and require additional resourcing to meet the expectations of their mission sets. Each satellite, satellite constellation, and terrestrial space surveillance site has its own unique characteristics and expected life span.

In 2018, the Air Force operated 77 satellites.<sup>23</sup> Today, thanks partly to service equipment transfers and additional fielding, the number available to the Space Force has almost doubled to an estimated 147. (See Table 18).

## Position, Navigation, and Timing Satellites

**Global Positioning System (GPS) (37 Satellites).** Perhaps the best-known constellation of satellites under Space Force control, GPS provides PNT for millions of simultaneous users around the world. It takes 24 of these satellites to provide seamless global coverage, and 31 are currently operational.<sup>24</sup> At least six additional satellites have been decommissioned and serve as on-orbit spares, bringing the total number that are available to 37.<sup>25</sup>

GPS III is the latest upgrade to the platform and incorporates a more robust anti-jamming capability. The fifth GPS III satellite was launched into orbit in June 2021,<sup>26</sup> the sixth was launched in January 2023,<sup>27</sup> and the next four have been assembled and are waiting their turn in the launch queue.<sup>28</sup> The fact that GPS III satellites are interoperable with other Global Navigation Satellite Systems (GNSS) such as the European Galileo network and the Japanese Quazi-Zenith Satellite System adds an impressive level of resiliency to the constellation.<sup>29</sup>

## Weather Satellites

**Defense Meteorological Satellite Program (DMSP) (Four Satellites).** Defense weather satellites have been collecting weather data and providing forecasts for U.S. military operations since 1962 through the DMSP.<sup>30</sup> Currently, four DMSP satellites are operational and in polar LEO.<sup>31</sup> The main sensors for these weather satellites are optical, and each provides continuous visual and infrared imagery of cloud cover over an area approximately 1,600 nautical miles wide, enabling complete global coverage of weather features every 14 hours.<sup>32</sup> Launched between 1999 and 2009 with a life expectancy of just five years, they have continued to deliver exceptional data well beyond their expected lifetimes. Space Force officials have warned that the DMSP constellation would become inoperable at some point between 2023 and 2026 and that the proposed replacement system<sup>33</sup> would not begin operation until 2024 at the earliest.<sup>34</sup>

**Electro-Optical Infrared Weather System-G (EWS-G) (Two Satellites).** Formerly named GOES, the second EWS-G was transferred from the National Oceanic and Atmospheric Administration (NOAA) to the USAF in 2023. The EWS-G is the first geostationary weather satellite owned by the DOD and provides theater weather imagery in the Indian Ocean region.<sup>35</sup>

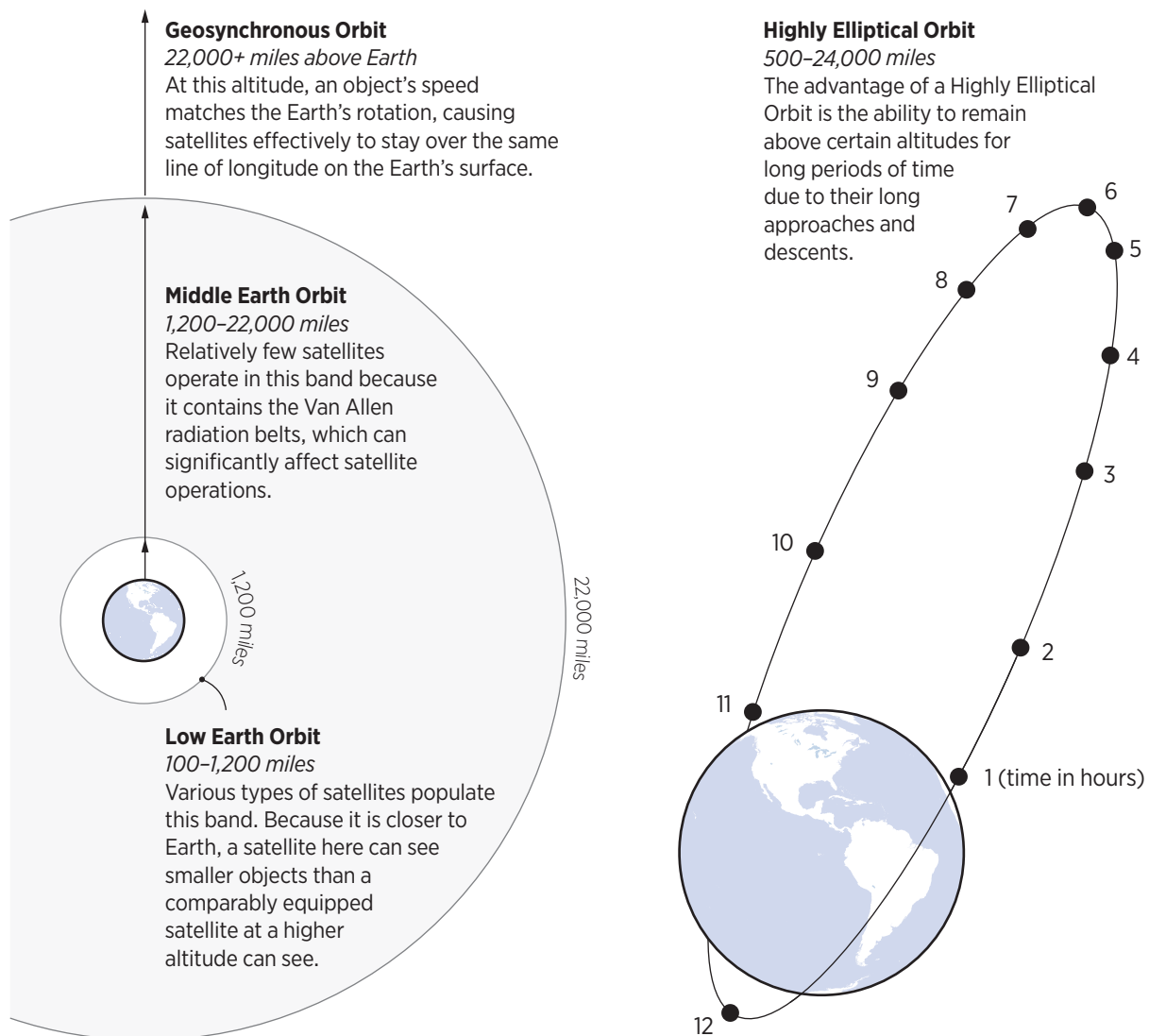
## Communications Satellites

**Military Strategic and Tactical Relay (Milstar) (Five Satellites).** This satellite communications system was designed in the 1980s to ensure that the National Command Authorities (President, Vice President, Secretary of Defense, Joint Chiefs of Staff, and Combatant Commanders) would have access to assured, survivable global communications with a low probability of intercept or detection. Milstar was designed to overcome enemy jamming and nuclear effects and was considered the DOD's most robust and reliable SATCOM system when it was fielded.

The first two satellites (Milstar I) carry a low data rate (LDR) payload that can transmit 75 to 2,400 bits per second (bps) of data over 192 channels in the extremely high frequency (EHF) range. Encryption technology and satellite-to-satellite crosslinks provide secure communications, data exchange, and global coverage. The other three satellites (Milstar II) carry both LDR and medium data

FIGURE 6

## Types of Earth Orbits



SOURCE: Heritage Foundation research.

heritage.org

rate (MDR) payloads and can transmit 4,800 bps to 1.544 megabits per second (Mbps) of data over 32 channels.<sup>36</sup> Milstar was fielded from 1993 through 2003 with a designed life of 10 years.<sup>37</sup>

**Advanced Extremely High Frequency System (AEHF) (Six Satellites)<sup>38</sup>.** Like Milstar, AEHF provides and sustains secure, jam-resistant communications and C2 for high-priority military assets located anywhere in the world. The system, which was launched into geosynchronous orbit

from 2010–2020 with a design life of 14 years, “will be integrated into the legacy Milstar...constellation” and “be backward compatible with Milstar’s low data rate (LDR) and medium data rate (MDR) capabilities, while providing extreme data rates (XDR) and larger capacity at substantially less cost than the Milstar system.”<sup>39</sup>

**Defense Satellite Communications System (DSCS) (Six Satellites).** These satellites provide nuclear-hardened, global communications to the



DOD, Department of State, and National Command Authorities. The system is capable of high data rates and provides anti-jamming capabilities. In all, the DSCS program successfully launched 14 satellites, six of which are still operational and serve operational communication requirements in Southwest Asia as well as research and development of ground-based support capabilities. These satellites were fielded from 1998 through 2003 into GEO with 10-year life spans.<sup>40</sup>

**Wideband Global SATCOM (WGS) (10 Satellites).** WGS is a joint-service program funded by the U.S. Air Force and U.S. Army, along with international partners Australia and Canada, and is used by all DOD services as well as National Command Authorities. Once known as the Wideband Gapfiller Satellite, WGS provides Super High Frequency (SHF) wideband communications, using direct broadcast satellite technology to provide C2 for U.S. and allied forces. With solid capabilities that include phased array antennas and digital signal processing technology, this system delivers a flexible architecture with a satellite life span of up to 14 years.<sup>41</sup> WGS-11 is scheduled to launch and join the constellation sometime in 2024.<sup>42</sup>

**Fleet Satellite Communications System (FLTSATCOM) (Six Satellites).**<sup>43</sup> FLTSATCOM is a constellation of six operational satellites used by the Navy, Air Force, and presidential command network. The system was launched into GEO between 1978 and 1989 to serve as a secure communications link between the three users with a design life of five years.<sup>44</sup> This constellation transferred from the U.S. Navy to the Space Force on June 6, 2022.<sup>45</sup>

**Ultra-High Frequency Follow-On (UFO) (10 Satellites).** The UFO constellation was designed to replace FLTSATCOM to provide communications for tactical users including aircraft, ships, submarines, and ground forces. UFO provides almost twice the throughput and 10 percent more power per channel than FLTSATCOM. This UFO constellation of satellites was launched into GEO between 1993 and 2003 with a life expectancy of from 14 to 15 years.<sup>46</sup> The system was transferred from the U.S. Navy to the Space Force on June 6, 2022.<sup>47</sup>

**Mobile User Objective System (MUOS) (Five Satellites).** MUOS is a next-generation narrowband tactical satellite communications system designed for tactical users with the goal of significantly improving ground communications, even for

troops in the most remote locations or in buildings with no other satellite access. MUOS satellites were launched into GEO from 2012 through 2016 with a design life of 15 years and provide the ability to transmit 10 times more information volume than can be transmitted with UFO.<sup>48</sup> This constellation was transferred from the U.S. Navy to the Space Force on June 6, 2022.<sup>49</sup>

**Continuous Broadcast Augmenting SATCOM (CBAS) (Two Satellites).** CBAS is a satellite communications system in GEO that provides communications relay capabilities to support senior leaders and Combatant Commanders, augmenting existing military satcom. CBAS 1 was launched on April 14, 2018, and CBAS-2 was launched on January 15, 2023.<sup>50</sup>

**Proliferated Warfighter Space Architecture (PWSA) Transport Layer Tranche 0 (19 Satellites).** Once fully fielded, the PWSA Tranche 0 constellation of 19 transport satellites and eight tracking platforms<sup>51</sup> will serve as a warfighter testbed/immersion constellation that will support military exercises and provide low-latency data connectivity and on-orbit fusion.<sup>52</sup> While it is a demonstration testbed for future tranches, the Tranche 0 constellation will no doubt be able to service ongoing operational needs well after the utility of their test function has been served.<sup>53</sup> The PWSA's programmed life span is unknown.

## Space Situational Awareness Systems

Knowledge of hostile space systems—their locations, their positional history, and how those satellites and other spacecraft are maneuvering in real time—conveys intent and collectively shapes the protocols and counterspace decisions that follow. Space situational awareness is therefore critical to every aspect of defensive and offensive counterspace operations and forms the foundation for DOD counterspace activities.<sup>54</sup>

In addition to adversary systems, other significant threats are in orbit. Objects in low Earth orbit travel at more than 17,000 miles an hour,<sup>55</sup> and particles as small as a few thousandths of an inch in diameter traveling at those speeds can threaten everything from satellites to the International Space Station.<sup>56</sup>

In June 2023, the European Space Agency estimated that there are at least 36,500 objects that are more than four inches wide, 1 million between 0.4

inches and 4 inches across, and 130 million that are smaller than 0.4 inches but bigger than 0.04 inches.<sup>57</sup> The Space Force is currently tracking nearly 48,000 objects in space. Specifically:

The number of publicly reported tracked objects has grown from 8,927 in 2000 (2,671 active and inactive satellites, 90 space probes, and 6,096 pieces of debris) to about 47,800 today (7,200 active satellites, 19,600 pieces of debris of known origin, and 21,000 pieces of debris of unknown origin or which cannot be tracked repeatedly). Most of the increase in active satellites is the result of the massive number of small satellites launched to form constellations in low-Earth orbit starting in the 2010s, primarily by private firms. For example, the Starlink constellation of small communications satellites now has over 2,000 spacecraft with several thousand more to be added in the coming years. OneWeb is close to completing its constellation of about 900 small communications satellites. Planet's constellation has around 200 small Earth-observation satellites. In addition to the tracked debris, there are an additional estimated 600,000 to 900,000 fragments between 5 mm and 10 cm in size, and many hundreds of thousands of pieces smaller than 5 mm in size, that cannot be tracked.<sup>58</sup>

Maintaining a high level of situational awareness about satellites and debris orbiting across the vast dimensions of potential Earth orbits requires a robust and seamless network of space and terrestrial-based sensors, the earthbound portion of which is known collectively as the Space Surveillance Network (SSN). Understanding the capabilities and limitations of this network naturally begins with understanding the numbers and types of space-based and ground-based systems.

The SSA satellites, known collectively as the Space-Based Surveillance System (SBSS), operate in concert with ground-based sensors but without limitations such as weather that can obscure and sunlight that can blind ground-based optical sensors. SBSS consists of 11 acknowledged satellites. Some track objects and debris fields from LEO. Others operate from GEO and are capable of maneuvering to perform detailed inspections of orbiting objects that are of especially high interest.

**Geosynchronous Space Situational Awareness Program (GSSAP) (Six Satellites).** This classified surveillance constellation can accurately track and characterize objects in orbit.<sup>59</sup> Operating near GEO, GSSAP satellites are maneuverable and therefore able to perform rendezvous and proximity operations (RPO) on objects of interest in space.<sup>60</sup> The first two GSSAP satellites were put in orbit on July 28, 2014; the second two were launched on August 19, 2016; and a third pair was launched on January 21, 2022.<sup>61</sup> Each GSSAP satellite has an estimated life span of seven years.<sup>62</sup>

**Long Duration Propulsive Evolved Expendable Launch Vehicle (LPDE) (Three Satellites).** LPDE is an acronym of acronyms that stands for Long Duration Propulsive Evolved Expendable Launch Vehicle Secondary Payload Adapter. LPDE has been renamed, and future launches will be known as Rapid On-Orbit Space Technology and Evaluation Ring (ROOSTER). These satellites provide power, pointing, telemetry, and command and control for payloads of up to six sensors that remain with and are supported by the vehicle or an equal number of deployable small satellites (SmallSats) to LEO, medium Earth orbit (MEO), GEO, or Super GEO.<sup>63</sup> LPDE's hydrazine propulsion module provides up to 400 meters per second of delta-V, giving it the ability to deploy satellites or to sustain or change its own orbit with precision.<sup>64</sup>

LPDE-1 was launched in December 2021 carrying the Ascent SmallSat and three additional undisclosed payloads.<sup>65</sup> LPDE-2 was launched in November 2022 carrying three SmallSats, including Alpine, and Tetra-1.<sup>66</sup> LPDE-3 was launched in January 2023 carrying a combination of five hosted sensors/payloads and the SmallSat ECP-Lite.<sup>67</sup> Details for those satellites and payloads are provided in the paragraphs that follow.

**Wide Area Search Satellite (WASSAT) (One Sensor).** WASSAT is a camera/sensor package supported on LPDE-3 that is designed to monitor other satellites and gather data on their trajectories and anomalies like changes in their orbits.<sup>68</sup>

**Space-Based Space Surveillance System-1 (SBSS-1) (One Satellite).** The SBSS-1 satellite was launched into LEO in 2010 to detect and track space objects such as satellites and orbital debris. This satellite has a seven-year life expectancy.<sup>69</sup>

**Space Tracking and Surveillance System Advanced Technology Risk Reduction (STSS-ATR)**

**(One Satellite).** STSS-ATR is an RDT&E satellite placed in a polar LEO on May 5, 2009, for the Missile Defense Agency (MDA) to test an alternate technology for potential application to missile defense.<sup>70</sup>

### Space Surveillance Network (SSN) Terrestrial-Based Sensors (24 Sensors).

There are six dedicated, ground-based radar sensors that track satellites and orbital debris, including the Space Fence on Kwajalein Atoll in the South Pacific. Seven collateral radar sensors are part of this network, but their primary mission is to detect and track intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs) and to test and evaluate other systems.<sup>71</sup> Another 10 contributing SSN sensors controlled by other organizations or agencies provide space surveillance support upon request from the National Space Defense Center (NSDC).<sup>72</sup> The Space Fence radar emits a very narrow, fan-shaped beam in the north-south direction that “paints” satellites and debris from low Earth orbit as they fly through the radar fan, and it can track objects all the way out to GEO.

#### Offensive and Defensive Satellites and Sensors

**Ascent (One Satellite).** Ascent is a 12-unit (12U) miniaturized satellite (CubeSat) that was deployed to evaluate CubeSat operations in GEO.<sup>73</sup> Billed as a developmental SmallSat, its CubeSats likely have the ability to conduct RPO operations, potentially providing a lasting, on-orbit, offensive capability.

**Tetra-1 (One Satellite).** Tetra-1 is the first of a series of GEO-based SmallSats and was launched on November 1, 2022. The Tetra series is designed to host a variety of payloads and will have interesting maneuverability options<sup>74</sup> that will help to develop on-orbit tactics, techniques, and procedures.<sup>75</sup>

**Energetic Charged Particle-Lite (ECP-Lite) (One-Sensor Payload).** ECP-Lite is a suite of sensors packaged in a container that is less than half of a cubic foot in size and is designed to be attached to host satellites. This sensor suite detects threats that include space weather and “other” hazards that involve surface impacts, dose, and internal and surface charging.<sup>76</sup> This is very likely a prototype threat warning system, similar to radar warning receivers (RWR) on fighter aircraft, that will be packaged with future spaceborne systems to significantly improve the defensive capabilities of on-orbit platforms.

**Catcher (One-Sensor Payload).** Catcher is a sensor similar to ECP-Lite that can detect threats

near the host’s surrounding environment, including mechanical impact threats from the electromagnetic spectrum.<sup>77</sup>

### Early Missile Warning/Tracking and Nuclear Detonation Detection

**Space-Based Infra-Red System (SBIRS) (10 Satellites).** SBIRS is an integrated constellation of satellites that was designed to deliver early missile warning and provide intercept cues for missile defenses. This surveillance network was designed to incorporate three satellites in high elliptical orbit (HEO) and eight others in GEO, each working in concert with ground-based data processing and command and control centers. Because SBIRS HEO is a retaskable orbit, these satellites can be moved to more optimal orbits/viewpoints as mission requirements dictate. Four SBIRS HEO<sup>78</sup> satellites are in orbit,<sup>79</sup> and the sixth and final satellite in this constellation, GEO-6, was launched into orbit on August 4, 2022.<sup>80</sup> Each of these satellites has a programmed life span of 12 years.<sup>81</sup>

The funding that was removed from SBIRS was shifted to a new program, Next-Generation Overhead Persistent Infrared (Next-Gen OPIR), which will include a new ground-control system. The proposed constellation will consist of five satellites, three in geosynchronous orbit and two in polar orbit.<sup>82</sup> Fielding of this strategically survivable constellation of missile warning satellites is scheduled to begin sometime near the end of FY 2023.<sup>83</sup>

**Proliferated Warfighter Space Architecture (PWSA) Tranche 0-Tracking (Four Satellites).** The PWSA Tranche 0 constellation will serve as a warfighter immersion/support military exercises tranche, including advanced missile tracking tests, with low-latency data connectivity, beyond-line-of-sight targeting, missile warning/missile tracking, on-orbit fusion, and multi-phenomenology ground-based sensor fusion.<sup>84</sup> These are the first Tracking Layer satellites with Wide Field of View (WFOV) infrared sensors. The operational constellation that follows (Tranche 1) will also have Medium Field of View (MFOV) infrared sensors that collectively will provide global, persistent detection, tracking, and queuing data for missile defense systems.

Once fully fielded, the PWSA Tranche 0 constellation of 19 transport satellites and eight tracking platforms<sup>85</sup> will serve as a warfighter testbed/immersion constellation that will support military

TABLE 16

## Space Launches by Country

|              | U.S.       | China      | Russia     | India     |
|--------------|------------|------------|------------|-----------|
| 2010         | 15         | 15         | 22         | 1         |
| 2011         | 17         | 19         | 21         | 3         |
| 2012         | 12         | 19         | 14         | 2         |
| 2013         | 19         | 14         | 21         | 3         |
| 2014         | 22         | 16         | 26         | 5         |
| 2015         | 20         | 19         | 19         | 5         |
| 2016         | 26         | 20         | 13         | 7         |
| 2017         | 30         | 16         | 14         | 4         |
| 2018         | 33         | 38         | 15         | 7         |
| 2019         | 27         | 32         | 21         | 6         |
| 2020         | 38         | 35         | 12         | 2         |
| 2021         | 51         | 54         | 16         | 1         |
| 2022         | 79         | 62         | 21         | 4         |
| 2023         | 118        | 24         | 18         | 14        |
| <b>Total</b> | <b>507</b> | <b>383</b> | <b>253</b> | <b>64</b> |

**NOTE:** Figures for 2023 include both actual and projected launches.

**SOURCE:** Space Launch Schedule, <https://www.spacelaunchschedule.com/> (accessed September 11, 2023).

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exercises and provide low-latency data connectivity and on-orbit fusion.<sup>86</sup> While it is a demonstration testbed for future tranches, the Tranche 0 constellation will no doubt be able to service ongoing operational needs well after the utility of their test function has been served.<sup>87</sup> The PWSA's programmed life span is unknown.

**Defense Support Program (DSP) (Five Satellites).** DSP is a classified constellation that was designed to detect launches of ICBMs or SLBMs against the U.S. and its allies. Its secondary missions include detection of space launch missions or nuclear weapons testing and detonations, as well as launches of shorter-range ballistic missiles. The DSP constellation uses infrared sensors to pick up the heat from missile booster plumes against the Earth's background from GEO orbits. Phase 1 placed four satellites in orbit from 1970 through 1973<sup>88</sup> and

was followed by Phase 2, which placed six satellites in orbit from 1979–1987.<sup>89</sup> Phase 3 consisted of 10 DSP satellites that were launched from 1989–2007.<sup>90</sup>

Although Phase 3 DSP satellites have long exceeded their five-year design lives,<sup>91</sup> reliability has exceeded expectations. At least five<sup>92</sup> are still operational, providing reliable data, and are now integrated with and controlled by the SBIRS program ground station.<sup>93</sup>

**Space Tracking and Surveillance System (STSS) (Two Satellites).** Formerly known as SBIRS-Low, the two STSS satellites carry a very capable set of infrared and visible sensors for detecting and tracking ballistic missiles through all phases of their trajectory. These satellites were launched into LEO in 2009 with programmed life spans of two years.<sup>94</sup>

**Space Test Program Satellite-6 (STPSat-6) (One Satellite).** STPSat-6 hosts nine national security and science mission payloads that deliver operational Nuclear Detonation (NUDET) detection capabilities, high-bandwidth laser communications services, and new technology demonstrations in space domain awareness, weather, and NUDET detection.<sup>95</sup> STPSat-6 has an estimated life span of from eight–10 years.<sup>96</sup>

**Reconnaissance and Imaging Satellites (Number Unknown).** Although the history of the Air Force is steeped in these reconnaissance systems, the operational details of each constellation are classified. In the late 1990s and early 2000s, the Air Force moved to develop and field a constellation of space-based radar satellites. That program, known as Lacrosse/Onyx, launched five satellites, each carrying a synthetic aperture radar (SAR) as its prime imaging sensor. Because SAR systems can see through clouds with high resolution, they offer the potential to provide a capability from which it is hard to hide.<sup>97</sup>

### Ground Control Network

The majority of USSF satellites are controlled by a network of 19 parabolic antennas distributed across seven locations around the world.<sup>98</sup> The antennas are massive, permanent fixtures, which makes them easy targets for adversaries during hostilities. If all seven locations were taken offline, it would sever our ability to communicate with a host of critical spaceborne systems. The USSF should aggressively expand the ground control network with

TABLE 17

## U.S. Space Launches by Organization

| Company                | 2010      | 2011      | 2012      | 2013      | 2014      | 2015      | 2016      | 2017      | 2018      | 2019      | 2020      | 2021      | 2022      | 2023       |
|------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Space X                | 2         | 0         | 1         | 3         | 6         | 6         | 8         | 18        | 21        | 15        | 28        | 33        | 61        | 97         |
| Northrop Grumman       | 2         | 3         | 1         | 5         | 2         | 0         | 2         | 3         | 2         | 3         | 3         | 4         | 2         | 1          |
| United Launch Alliance | 9         | 12        | 10        | 11        | 14        | 12        | 12        | 8         | 8         | 5         | 6         | 5         | 8         | 12         |
| Astra                  | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 1         | 1         | 0          |
| Rocket Lab, LTD        | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 4          |
| Firefly Aerospace      | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 1         | 2          |
| NASA                   | 2*        | 2*        | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 1         | 0         | 0         | 1         | 0          |
| Blue Origin            | 0         | 0         | 0         | 0         | 0         | 2         | 4         | 1         | 2         | 3         | 1         | 6         | 3         | 1          |
| Virgin Orbit           | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 2         | 2         | 0          |
| Relatively             | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 1          |
| <b>Total</b>           | <b>15</b> | <b>17</b> | <b>12</b> | <b>19</b> | <b>22</b> | <b>20</b> | <b>26</b> | <b>30</b> | <b>33</b> | <b>27</b> | <b>38</b> | <b>51</b> | <b>79</b> | <b>118</b> |

\* United Space Alliance.

**NOTE:** Figures for 2023 include actual and projected launches.

**SOURCE:** Space Launch Schedule, "USA Launch Schedule," <https://www.spacelaunchschedule.com/category/usa/> (accessed September 18, 2023).

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additional fixed and mobile parabolic antenna systems to ensure that connectivity remains seamless.

All GPS satellites are controlled by the Master Control Station (MCS) at Schriever Space Force Base in Colorado and an Alternate MCS (AMCS) at Vandenberg Space Force Base in California, "both of which include the ground antenna and monitoring stations."<sup>99</sup>

### Space Launch Capacity

The Space Force manages the National Security Space Launch (NSSL) program, a Major Defense Acquisition Program that acquires launch services from private companies to deliver national security satellites into orbit. Currently, the NSSL uses the Atlas V and Delta IV Heavy launch vehicles from United Launch Alliance (ULA) and the Falcon 9 and Falcon Heavy from SpaceX to launch national security payloads.

In 2018, the Air Force awarded three launch services agreements to space launch companies to develop their launch vehicles for a second phase of

the NSSL. In 2020, the Space Force awarded two launch services procurement contracts to ULA and SpaceX, and those two vendors will provide space launch services for the Space Force through 2027.<sup>100</sup>

In 2010, four organizations, including NASA, were involved in launching manned and unmanned systems into space. Today, nine private American corporations are engaged in placing satellites into orbit.<sup>101</sup>

In 2023, U.S. companies are scheduled to launch 118 missions into space, and China and Russia are scheduled to conduct 24 and 18 launches, respectively.<sup>102</sup> The numbers for China and Russia are based on launch schedules published for each of those countries and are often misleading. China planned 22 launches in 2022, but it actually launched 62 missions into space, which was just behind the U.S.'s 79 space shots for that same year.<sup>103</sup> America is still outpacing its peers with this vital capability, but the competition appears to be gaining.

TABLE 18

## U.S. Satellites in Orbit

| System  | Function                               | Satellites |
|---|--|------------|
| GPS   | Positioning, Navigation, and Timing    | 37         |
| DMSP  | Weather                                | 4          |
| Electro-Optical Infrared Weather System - G1                          | Weather                                | 2          |
| Milstar   | Communications                         | 5          |
| AEHF  | Communications                         | 6          |
| DSCS  | Communications                         | 6          |
| WGS   | Communications                         | 10         |
| Continuous Broadcast Augmenting SATCOM (CBAS)                         | Communications                         | 2          |
| Fleet Satellite Communications System (FLTSAT)                        | Communications                         | 6          |
| Ultra-Hi Freq Follow-On (UFO)   | Communications                         | 10         |
| Mobile User Objective System (MUOS)                                   | Communications                         | 5          |
| Tranche 0 Transport Proliferated Warfighter Space Architecture (PWSA) | Communications                         | 19         |
| SBIRS   | Missile Warning                        | 10         |
| DSP   | Missile Warning                        | 5          |
| Tranche 0 Tracking Proliferated Warfighter Space Architecture (PWSA)  | Missile Warning                        | 4          |
| LPDE  | Payload Support and Satellite Delivery | 3          |
| Tetra 1 - GEO   | Classified                             | 1          |
| Ascent  | Cubesat Payload Delivery               | 1          |
| Space Test Program Satellite 6 (STPSat-6)                             | Nuclear Detonation Detection           | 1          |
| GSSAP   | Space Surveillance                     | 6          |
| Silent Barker (Space Object Tracking)                                 | Space Surveillance                     | 2          |
| SBSS  | Space Surveillance                     | 1          |
| STSS-ATR  | Missile Defense and Space Tracking     | 1          |
| <b>Total</b>  |  | <b>147</b> |

**SOURCES:** Heritage Foundation research using data from Gunter's Space Page, <https://space.skyrocket.de> (accessed September 21, 2023), and U.S. Air Force, *Air & Space Forces Magazine*, Airforce Technology, Los Angeles Air Force Base, GlobalSecurity.org, Space Development Agency, U.S. Department of Defense, *SpaceNews*, *Popular Mechanics*, Air Force Research Laboratory, and Northrop Grumman.

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### Capacity

The USSF has increased the number of satellites in its portfolio from an estimated 114 satellites in 2022 to an estimated 144 in 2023, a 24 percent growth

in a single year. That space-based portfolio can meet much of the communications, collection, and imagery demand placed on it by the National Command Authorities and the strategic-level intelligence

requirements of the Defense Department. However, getting real-time satellite intelligence to warfighters at the operational and tactical levels is still problematic. The growth in the number of satellites in the Space Force constellation not only delivers more capability and capacity, but also provides additional resilience against a potential adversary.

The position, navigation, and timing services offered by GPS are unrivaled in both capacity and capability. With 31 operational GPS satellites in orbit and seven spaceborne (dormant) spares, the system has enough redundancy and resilience to handle losses associated with normal (not combat-related) space operations.

The current and growing DOD demands for imagery and collection are another thing entirely. The shortfall is projected to be so great that the Departments of the Air Force and Army, the National Reconnaissance Office, and other agencies have invested in and are employing the services of commercial organizations to provide collection and imagery on demand.<sup>104</sup>

Over the past several years, the U.S. Army has conducted a series of exercises called Project Convergence (PC), which are designed to test the capability of DOD and commercial spaceborne systems to provide the intelligence, imagery, and communications linkages for warfighters in the service's "close fight." In PC20, Army Brigade Combat Teams (BCTs), Combat Aviation Brigades (CABs), and Expeditionary Signal Battalion-Enhanced (ESB-E) units had access to 600 commercial SpaceX Starlink satellites in LEO<sup>105</sup> that readily enabled tactical employment.<sup>106</sup> As of August 27, 2023, 4,661 Starlink satellites were in orbit.<sup>107</sup> Systems like Starlink will help to enable the service's concept for a Multi-Domain Operations (MDO)-capable force by 2028 and an MDO-ready force by 2035.<sup>108</sup>

The capabilities and resilience offered by commercial systems like Starlink have been clearly demonstrated in Ukraine, where thousands of deployed Starlink Internet terminals have ensured Ukraine's internal and external connectivity with Western governments, nullifying a significant part of Russia's information campaign.<sup>109</sup> Starlink reportedly also has the ability to provide a very accurate PNT backup for GPS, which will become increasingly important for all of the services as the competition in space intensifies.<sup>110</sup>

Integrating LEO, MEO, and GEO satellite capabilities will continue to increase network resilience

for the warfighter.<sup>111</sup> The capabilities demonstrated in the PC exercise series are similar to those sought in the Air Force's Advanced Battle Management System (ABMS) and the Navy's Overmatch C2 development programs.<sup>112</sup>

The USSF's ISR portfolio of satellites has grown from 15 to 19 known satellites that are dedicated to missile launch warning—a 27 percent increase over 2022. The Space Force's 10 SBIRS satellites, five DSP satellites, and four PWSA Tranche 0 satellites provide global coverage and generally excellent response times.

As noted, the current portfolio of reconnaissance satellites, while highly classified, likely meets many of the essential strategic requirements of the National Command Authority (NCA) and the Defense Department. However, Space Force capabilities fall well short of the needs of the services. The Department of the Air Force is therefore investing in and employing the services of commercial organizations to meet the on-demand collection and imagery needs of USSF customers.<sup>113</sup>

The Space Force's acknowledged and unacknowledged SSA satellites, coupled with six dedicated and 17 collateral and contributing ground-based sensors, help to maintain situational awareness of satellites and other objects in space. However, the limited number and inherent limitations of the sensors within the SBSS leave significant gaps in coverage. Those gaps are addressed by prediction, and every time a satellite maneuvers, "the process of initial discovery by a sensor, creation of an initial element set, and refinement of that element set needs to be repeated."<sup>114</sup>

## Capability

Defensive systems and operations are designed to protect friendly space capabilities against kinetic anti-satellite (ASAT) weapons, high-powered lasers, laser dazzling or blinding, and high-powered microwave systems.<sup>115</sup>

The first challenge in defense is detecting an attack. The USSF has 14 SSA satellites that are dedicated to detecting the launch of terrestrial-based ASAT weapons. The gaps in the SSA network highlighted earlier make the timely assessment of and response to such an attack on a specific U.S. satellite difficult.

Several years ago, the Space Force fielded a terrestrial-based system called Bounty Hunter that can detect an adversary's attempts to deceive,

disrupt, deny, or degrade satellite communications by monitoring electromagnetic interference across multiple frequency bands. Bounty Hunter operators can locate sources of intentional and unintentional interference and minimize them.<sup>116</sup> This system achieved initial operational capability (IOC) in the summer of 2020 and is a significant addition to the Space Force portfolio, but it has no known capability to detect or counter lasers. Having threat detection payloads like ECP-Lite and Catcher onboard our satellites will help to close that gap and give our systems and their operators the chance to maneuver out of the threat's path.

Cyberattacks present a different challenge to space-based systems. Like other kinetic and non-kinetic attacks, cyber intrusions can cause service disruptions, sensor interference, or the permanent loss of satellite capabilities. Additionally, an effective cyberattack could corrupt the satellite's data stream to reliant elements or systems—or even allow an adversary to seize control of a satellite. According to the Royal Institute of International Affairs, the U.S. is well behind its peer competitors in this area and should assume that its satellite constellations have already been penetrated and compromised.<sup>117</sup>

Defensive measures that the service can take to safeguard its spaceborne portfolio can be separated into two categories of actions: passive and active.

- Passive defense measures increase survivability through asset proliferation, placing spaceborne capabilities in different orbits to complicate an enemy's targeting problem and threat warning sensors on our assets to allow real-time threat detection and enable satellite maneuvering by an operator or artificial intelligence system.<sup>118</sup> The Space Force has made great strides in each of these areas.
- An active defense is actually offensive in nature and includes engagements to destroy, nullify,

or reduce enemy systems that put U.S. and allied systems and capabilities at risk.

The FY 2017 Air Force budget included \$158 million to develop offensive space capabilities over a period of five years, and this appears to be paying dividends.<sup>119</sup> The only offensive Space Force system of record in open-source literature is a mobile, terrestrial-based, counter-communications system that delivers reversible effects on hostile SATCOM systems in a given area of responsibility (AOR).<sup>120</sup> However, with the fielding of Ascent and Tetra-1, the Space Force appears to be building classic offensive counterspace capabilities. Both satellites can move to engage with and deliver CubeSats with RPO capabilities that attach to enemy systems and lie in wait until their payloads are activated to take those satellites offline. While unconfirmed in literature, the potential for those activities has been confirmed by senior USSF officials.

### Readiness

The Space Force was born of a congressionally mandated study that included a plan for the incremental transition of operational Air Force space assets and personnel to the new service. Throughout the plan's execution, the USSF has been deliberate in its hiring and is on a path to developing a solid cadre of personnel and a strong organizational culture.

The operations assumed by the USSF to support strategic and high-end operational-level support have proceeded uninterrupted, and readiness has remained high, but those operations were primarily supportive in nature and did not include robust, nearly real-time support to tactical units. While the service is undoubtedly moving forward on credible defensive and offensive readiness, there is little evidence that it is ready for the threat envisioned by Congress when it authorized creation of the Space Force.

## Scoring the U.S. Space Force

### Capacity Score: Marginal

The numbers and types of Backbone and ISR assets are sufficient to support global PNT requirements and the majority of strategic-level communications, imagery, and collection requirements of

the National Command Authorities and the Department of Defense. While that capacity is growing, the Space Force is not capable of meeting current—much less future—on-demand, operational, and tactical-level warfighter requirements.



As noted in the capability section, the gaps in the SBSS are covered by prediction, and operators of adversarial satellites can time their maneuvers to take advantage of those gaps.

With the fielding of WASSAT sensor payload, the capacity for the Space Force to track hostile space-based threats has improved and will continue to improve significantly. The U.S. had announced plans to build a second, strategically located Space Fence like the one on Kwajalein Atoll in Western Australia in 2021, but that site has yet to be funded.<sup>121</sup> Even if a second Space Fence does eventually materialize, the Space Force will still need more satellites that are dedicated to this mission.<sup>122</sup>

The service doubled its counterspace weapons systems' capabilities with the Ascent and Tetra-1 satellites, adding the first two known offensive systems to the Space Force portfolio. Other counterspace systems are probably being developed or, like cyber, are already in play without public announcement. Nevertheless, the USSF's current visible capacity is not sufficient to support, fight, or weather a war with a peer competitor.

### Capability Score: Marginal

SDA's asset modernization plan significantly accelerated the delivery of systems to the Space Force over the past year, significantly elevating USSF capabilities. However, a majority of Backbone and ISR assets have exceeded their designed life spans, and the DAF's willingness to delay and/or defer the acquisition of replacement systems remains a legacy of that department.

The capability of Backbone and ISR satellites is marginal, but the service has narrowed gaps in SSA,

defensive, and offensive capabilities. The capability score is therefore "marginal," the result of being scored "strong" in "Size of Modernization Program," "marginal" for "Age of Equipment" and "Health of Modernization Programs," and "marginal" for "Capability of Equipment."

### Readiness Score: Marginal

The mission sets, space assets, and personnel that transitioned to the Space Force and those that have been assigned to support the USSF from the other services have not missed an operational beat since the Space Force stood up in 2019. Throughout that period, readiness levels have seamlessly sustained Backbone and ISR support to the NCA, DOD, Combatant Commanders, and warfighters around the world.

However, there is little evidence that the USSF has improved its readiness to provide nearly real-time support to operational and tactical levels of force operations ("marginal") or its readiness to execute defensive and offensive counterspace operations to the degree envisioned by Congress when it authorized creation of the Space Force ("weak").

### Overall U.S. Space Force Score: Marginal

This is an unweighted average of the USSF's capacity score of "marginal," capability score of "marginal," and readiness score of "marginal," which is one grade higher than the service was rated in the *2023 Index of Military Strength*. The trend lines for capability and capacity are improving rapidly, and this could bode well for the service in 2024 and beyond.

## U.S. Military Power: Space

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

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023 ■ Pending

## Navigation

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>Global Positioning System (GPS)</b></p> <p>Inventory: <b>37</b><br/>Fleet age: <b>13.5</b> Date: <b>1997</b></p> <p>GPS satellites provide precise positioning, navigation, and timing (PNT) for millions of simultaneous users around the world. The current constellation of 37 satellites is comprised of Block IIR (launched from 1997–2004); IIR-M (2005–2009); IIF (2010–2016); and III/IIIF (first launch 2018) satellites with steadily increasing capabilities.</p> | 5         | 5                | <p><b>GPS III</b></p> <p>Timeline: <b>2019–TBD</b></p> <p>GPS III is the latest upgrade to the GPS platform and incorporates more robust anti-jamming capabilities. It is interoperable with other countries' Global Navigation Satellite Systems, which adds resilience to the GPS system.</p> <p><b>PROCUREMENT</b> <b>SPENDING (\$ millions)</b></p> <p>7 12 \$2,026 \$5,060</p> | 5          | 5            |

## Missile Warning

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|--|-----------|------------------|---|------------|--------------|
| <p><b>Space Based Infrared System (SBIRS)</b></p> <p>Inventory: <b>10</b><br/>Fleet age: <b>9</b> Date: <b>2006</b></p> <p>An integrated constellation of 10 satellites, SBIRS is designed to deliver early missile warning and provide intercept cues for missile defenses. The satellites are retaskable, which means they can be moved to more optimum orbits and viewpoints as mission requirements dictate. The program was ended early because of cost, schedule, and performance issues.</p>  | 5         | 5                | <p><b>Next Generation Persistent Infrared (Next-Gen OPIR)</b></p> <p>Timeline: <b>TBD</b></p> <p>When the SBIRS program was ended early, its remaining funding was shifted to its follow-on program, the Next-Gen OPIR. This program's objective is to deliver resilient detection and tracking capability in a contested environment given the advances in adversary rocket propulsion technology.</p> |            |              |
| <p><b>Defense Support Program (DSP)</b></p> <p>Inventory: <b>5</b><br/>Fleet age: <b>34.5</b> Date: <b>1970</b></p> <p>These satellites were designed to detect intercontinental ballistic missile and sea-launched ballistic missile launches against the U.S. and its allies. They can also detect space launch missions and nuclear weapons testing/detonations. Phase 3 satellites were launched from 1989 to 2007 and have long exceeded their designed lifetimes, but at least five are still providing reliable data and are integrated with the SBIRS program.</p> | 1         | 4                |   |            |              |

**NOTE:** See page 561 for details on fleet ages, dates, timelines, and procurement spending.

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Space Surveillance

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>Space Based Surveillance System (SBSS)</b></p> <p>Inventory: 1<br/>Fleet age: 13 Date: 2010</p> <p>This single satellite uses multiple types of sensors to track man-made objects and debris fields in orbit.</p>  | 2         | 3                | None                |            |              |
| <p><b>Space Test Program Satellite-6 (STPSat-6)</b></p> <p>Inventory: 1<br/>Fleet age: 2 Date: 2021</p> <p>STPSat-6 hosts nine national security and science mission payloads that deliver operational nuclear detonation detection capabilities, high-bandwidth laser communications services, and new technology demonstrations in space domain awareness.</p>   |           | 3                |                     |            |              |
| <p><b>Long Duration Propulsive Evolved Expendable Launch Vehicle (LPDE)</b></p> <p>Inventory: 3<br/>Fleet age: 1 Date: 2021</p> <p>These satellites provide power, pointing, telemetry, and command and control for up to six sensors payloads that remain with and are supported by the vehicle, or an equal number of deployable SmallSats to low Earth orbit (LEO); medium Earth orbit (MEO); geosynchronous orbit (GEO); or Super GEO.</p> | 5         |                  |                     |            | 5            |

## Missile Defense

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|---|-----------|------------------|---------------------|------------|--------------|
| <p><b>Space Tracking and Surveillance System Advanced Technology Risk Reduction (STSS-ATR)</b></p> <p>Inventory: 1<br/>Fleet age: 14 Date: 2009</p> <p>This research, development, test, and evaluation (RDT&amp;E) satellite was originally launched by the Missile Defense Agency to explore different missile launch detection and early warning capabilities and technology but was transferred to the Air Force in 2011.</p> | 2         | 3                | None                |            |              |

**NOTE:** See page 561 for details on fleet ages, dates, timelines, and procurement spending.

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Space Object Tracking

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>Geosynchronous Space Situational Awareness Program (GSSAP)</b></p> <p>Inventory: <b>6</b><br/>Fleet age: <b>5</b> Date: <b>2014</b></p> <p>This highly classified, six-satellite constellation can accurately track and characterize objects in orbit using electro-optical and emissions sensors. Their maneuverability allows them to conduct rendezvous and proximity operations (RPO) on space objects, giving them the potential to conduct offensive operations against other nations' assets.</p> | <b>5</b>  | <b>5</b>         | None                |            |              |

## Weather

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM   | Size Score | Health Score |
|---|-----------|------------------|---|------------|--------------|
| <p><b>Defense Meteorological Satellite Program (DMSP)</b></p> <p>Inventory: <b>4</b><br/>Fleet age: <b>19</b> Date: <b>1999</b></p> <p>This three-satellite constellation was launched between 1999 and 2009 with only a five-year life expectancy, but they have continued to provide accurate meteorological data well beyond that time frame and are still in use today. However, Space Force officials have warned that the DMSP constellation will become inoperable at some point between 2023 and 2026 and that the proposed replacement system will not begin operation until 2024 at the earliest.</p> | <b>1</b>  | <b>4</b>         | <p><b>Weather System Follow-on Microwave Satellite (WSF-M)</b></p> <p>Timeline: <b>TBD</b></p> <p>This next-generation weather satellite will be capable of mapping both terrestrial and space weather and is scheduled to be fielded in 2023. It covers three gaps in DOD's current weather monitoring capability: ocean surface vector winds, tropical cyclone intensity, and "energetic charged particles" in low Earth orbit.</p> |            |              |

## Communications

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|---|-----------|------------------|---------------------|------------|--------------|
| <p><b>Milstar</b></p> <p>Inventory: <b>5</b><br/>Fleet age: <b>24.5</b> Date: <b>1994</b></p> <p>Milstar is a satellite communications system designed in the 1980s to provide the National Command Authorities with global communications that were assured and survivable and that carried low probability of interception or detection. Designed to overcome nuclear effects and enemy jamming, this five-satellite constellation was considered the most robust and reliable DOD SATCOM system at the time of fielding.</p> | <b>1</b>  | <b>3</b>         | None                |            |              |

**NOTE:** See page 561 for details on fleet ages, dates, timelines, and procurement spending.

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Communications (Cont.)

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>Advanced Extremely High Frequency System (AEHF)</b></p> <p>Inventory: <b>6</b><br/>Fleet age: <b>8</b> Date: <b>2010</b></p> <p>The AEHF constellation is the follow-on to Milstar. Each of the six satellites provides DOD with more capacity than the entire Milstar constellation provides and with five times the Milstar data rates. The system offers secure, jam-resistant communications and command and control for military ground, sea, and air assets located anywhere in the world.</p> | 5         | 5                | None                |            |              |
| <p><b>Defense Satellite Communications System (DSCS)</b></p> <p>Inventory: <b>6</b><br/>Fleet age: <b>30.5</b> Date: <b>1982</b></p> <p>This system of seven satellites provides nuclear-hardened, global communications with anti-jamming capabilities to the Defense Department, State Department, and National Command Authorities.</p>   | 1         | 2                |                     |            |              |
| <p><b>Wideband Global SATCOM (WGS)</b></p> <p>Inventory: <b>10</b><br/>Fleet age: <b>10</b> Date: <b>2007</b></p> <p>WGS, formerly known as the Wideband Gapfiller Satellite, is a joint-service program funded by the U.S. Air Force and U.S. Army along with international partners Australia and Canada. The 10-satellite constellation uses direct broadcast satellite technology to provide command and control for U.S. and allied forces.</p>   | 4         | 5                |                     |            |              |
| <p><b>Fleet Satellite Communications System (FLTSATCOM)</b></p> <p>Inventory: <b>6</b><br/>Fleet age: <b>39.5</b> Date: <b>1978</b></p> <p>This constellation of six operational satellites is used by the Navy, the Air Force, and the presidential command network. It was transferred from the Navy to the Space Force in June 2022. WGS-11 is scheduled to launch and join the constellation sometime in 2024.</p>   | 1         | 3                |                     |            |              |
| <p><b>Ultra-High Frequency Follow-On (UFO)</b></p> <p>Inventory: <b>10</b><br/>Fleet age: <b>24</b> Date: <b>1993</b></p> <p>The 10-satellite UFO constellation was designed to replace FLTSATCOM and provides communications for tactical users including aircraft, ships, submarines, and ground forces. The Navy transferred this system to the Space Force in June 2022.</p>   | 1         | 3                |                     |            |              |

**NOTE:** See page 561 for details on fleet ages, dates, timelines, and procurement spending.

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Communications (Cont.)

| PLATFORM   | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|--|-----------|------------------|---------------------|------------|--------------|
| <p><b>Mobile User Objective System (MUOS)</b></p> <p>Inventory: <b>5</b><br/>Fleet age: <b>9</b> Date: <b>2012</b></p> <p>This next-generation narrowband tactical satellite communications system is designed for tactical users, significantly improving ground communications even for troops in highly remote locations or buildings with no other satellite access. The Navy transferred this five-satellite constellation to the Space Force in June 2022.</p> | 4         | 5                | None                |            |              |
| <p><b>Continuous Broadcast Augmenting SATCOM (CBAS)</b></p> <p>Inventory: <b>2</b><br/>Fleet age: <b>2.5</b> Date: <b>2018</b></p> <p>CBAS is a satellite communications system in GEO that provides communications relay capabilities to support senior leaders and combatant commanders, augmenting existing military satcom.</p>  | 5         | 3                |                     |            |              |

## Multi-Use

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|---|-----------|------------------|---------------------|------------|--------------|
| <p><b>Proliferated Warfighter Space Architecture (PWSA) Tranche 0 - Transport Sep 23 Launch</b></p> <p>Inventory: <b>19</b><br/>Fleet age: <b>0</b> Date: <b>2023</b></p> <p>PWSA Tranche 0 satellites serve as a warfighter testbed/immersion constellation that will support military exercises and provide low latency data connectivity and on-orbit fusion. While this is a demonstration testbed for future tranches, the Tranche 0 constellation of 19 planned transport satellites and four planned tracking platforms will no doubt be able to serve ongoing operational needs well after their test function has been served.</p> | 5         | 3                | None                |            |              |
| <p><b>Proliferated Warfighter Space Architecture (PWSA) Tranche 0 - Tracking Sep 23 Launch</b></p> <p>Inventory: <b>4</b><br/>Fleet age: <b>0</b> Date: <b>2023</b></p> <p>For description, see entry for Proliferated Warfighter Space Architecture (PWSA) Tranche 0 - Transport Sep 23 Launch.</p>  |           |                  |                     |            |              |

**NOTE:** See page 561 for details on fleet ages, dates, timelines, and procurement spending.

# SPACE FORCE SCORES



Procurement and Spending ■ Through FY 2023  
■ Pending

## Offensive and Defensive Satellites

| PLATFORM  | Age Score | Capability Score | REPLACEMENT PROGRAM | Size Score | Health Score |
|---|-----------|------------------|---------------------|------------|--------------|
| <p><b>Ascent</b><br/>Inventory: <b>1</b><br/>Fleet age: <b>2</b> Date: <b>2021</b></p> <p>Ascent is a 12-unit (12U) CubeSat that was deployed to evaluate CubeSat operations in GEO. It has the potential to provide a lasting, on-orbit offensive capability.</p>  |           |                  | None                |            |              |
| <p><b>Tetra-1</b><br/>Inventory: <b>1</b><br/>Fleet age: <b>1</b> Date: <b>2022</b></p> <p>Tetra-1 is the first of a series of GEO-based SmallSats that was launched on November 1, 2022. The Tetra series is designed to host a variety of payloads and will have interesting maneuverability options that will help develop on-orbit tactics, techniques, and procedures.</p> | <b>5</b>  | <b>3</b>         |                     |            |              |

**NOTES:** See Methodology for descriptions of scores. Fleet age is the average between the last year of procurement and the first year of initial operational capability. The date is when the platform achieved initial operational capability. The timeline is from the start of the platform's program to its budgetary conclusion. Spending does not include advanced procurement or research, development, test, and evaluation (RDT&E).

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# U.S. Nuclear Weapons

Michaela Dodge, PhD

To assess U.S. nuclear weapons properly, one must understand three things: their essential national security function, the growing nuclear threat posed by adversaries, and the current state of U.S. nuclear forces and their supporting infrastructure. Such an understanding helps to provide a clearer view of the state of America’s nuclear capabilities than might otherwise be possible.

## The Important Roles of U.S. Nuclear Weapons

U.S. nuclear weapons have played a critical role in preventing conflict among major powers in the post-World War II era. Given their ability both to deter large-scale attacks that threaten the U.S. homeland, allies, and forward-deployed troops and to assure allies and partners, nuclear deterrence has remained the number one U.S. national security mission.<sup>1</sup> Operationally, “[s]trategic deterrence is the foundation of our national defense policy and enables every U.S. military operation around the world.”<sup>2</sup> It is therefore critical that the United States maintain a modern and flexible nuclear arsenal that can deter a diverse range of threats from a diverse set of potential adversaries.

The more specific roles of U.S. nuclear weapons as outlined in U.S. policy have been adjusted over time. The most up-to-date applicable policy document, the 2022 Nuclear Posture Review (NPR), specifies three roles for nuclear weapons:

- Deter strategic attacks;
- Assure Allies and partners; and
- Achieve U.S. objectives if deterrence fails.<sup>3</sup>

These roles have been consistent across U.S. post-Cold War Administrations until the Biden

Administration chose to drop “Capacity to hedge against an uncertain future”<sup>4</sup> as one of the formal roles for U.S. nuclear weapons. This omission is puzzling, particularly given the global security environment’s degradation following the 2018 NPR. The Biden Administration has not clarified whether this omission will have practical implications for U.S. nuclear operations and posture, but it is critical that the United States retain the capability to respond flexibly to negative developments in the international environment in a timely manner—a capability the nation has been struggling to sustain since the end of the Cold War.

Given the rapid evolution of a range of capabilities fielded by China, Russia, and North Korea—and increasingly by Iran—the Administration’s decision to cancel the sea-launched cruise missile (SLCM-N) program is similarly puzzling. The Administration’s retention of the W76-2 low-yield submarine-launched nuclear warhead would seem to indicate that it recognizes the gap in regional nuclear capabilities that has left the United States at a major disadvantage against its adversaries. Adversaries have developed an array of smaller-yield weapons that provide a range of employment options, whereas the U.S. must rely almost exclusively on large-yield warheads. The SLCM-N would provide a more relevant option to U.S. leaders and thus likely serve as a more effective deterrent in these settings.

The Biden Administration emphasizes “[m]utual, verifiable nuclear arms control” as “the most effective, durable and responsible path to reduce the role of nuclear weapons in our strategy and prevent their use,”<sup>5</sup> but as former Deputy Assistant Secretary of Defense for Forces Policy Keith Payne points out, “[t]o claim that arms control rather than deterrence is the ‘most effective,

durable and responsible path’ to preventing the employment of nuclear weapons is manifestly problematic and suggests a distorted prioritization.”<sup>6</sup> The Biden Administration also canceled the B83 nuclear bomb, the most powerful nuclear weapon in the U.S. arsenal with a specific mission of targeting hard and deeply buried targets and an especially important capability in light of adversaries’ efforts to protect what they value.<sup>7</sup>

On the positive side, the Biden Administration refrained from implementing the “no first use” or “sole purpose” nuclear declaratory policy despite then-candidate Biden’s interest in doing so,<sup>8</sup> reportedly because of significant objections from U.S. allies. Another positive development is the Administration’s commitment to “tailored” deterrence, or the effort to use a specific understanding of what different antagonists value and threatening those valued targets during deterrence messaging.<sup>9</sup> As deterrence expert Greg Weaver has cogently observed, “[i]n a deterrence relationship, the adversary doesn’t just have ‘a’ vote, they have *the only vote*.”<sup>10</sup> That places a premium on understanding what adversaries value and threatening it in ways that are most likely to cause them to choose restraint. The Administration also endorsed the modernization of all three legs of the nuclear triad (bombers, intercontinental-range ballistic missiles, and submarines) that was started under the Obama Administration and continued by the Trump Administration.

To achieve the objectives spelled out in the NPR, the U.S. nuclear portfolio must balance the appropriate levels of capacity, capability, variety, flexibility, and readiness. What matters most in deterrence is not what the United States thinks will be effective, but the psychological perceptions—among both adversaries *and* allies—of America’s willingness to use nuclear forces to defend its interests and intervene on behalf of allies. If an adversary believes it can fight and win a limited nuclear war, for instance, U.S. leaders must devise a posture that will convince that adversary that this is not possible. In addition, as the 2022 NPR appropriately recognizes, military roles and requirements for nuclear weapons will differ from adversary to adversary based on each country’s values, strategy, force posture, and goals.

The United States also extends its nuclear umbrella to 33 allies that rely on America to defend them from large-scale attacks and existential threats from adversaries. This additional

responsibility imposes requirements for the U.S. nuclear force posture that go beyond defense of the U.S. homeland.

U.S. nuclear forces underpin the broad non-proliferation regime by assuring allies—including NATO, Japan, South Korea, and Australia—that they can forgo development of their own nuclear weapons. Erosion of America’s nuclear credibility could lead a country like Japan or South Korea to pursue an independent nuclear option, in which case the result could be a negative impact on stability across the region. Regrettably, there are signs that the credibility of U.S. assurances is in fact eroding. For example, South Korean President Yoon Suk Yeol recently stated that if the nuclear threat from North Korea continues to grow, his country “would consider building nuclear weapons of its own” and could do so “pretty quickly, given our scientific and technological capabilities.”<sup>11</sup>

In addition to deterrence and assurance, the United States historically has committed to achieving its political and military objectives if nuclear deterrence fails by having the will to use its nuclear weapons in war. This also contributes to deterrence both by convincing an adversary that it could not start and win a nuclear war and by minimizing U.S. subjection to nuclear coercion by peer nuclear adversaries. U.S. forces must therefore be survivable and postured to engage their targets successfully if deterrence fails and it becomes necessary to use nuclear weapons.

### Understanding Today’s Multipolar Global Threat Environment

Any assessment of nuclear capabilities requires an understanding of the threat environment, as any U.S. strategy or force posture must account for the threat it is meant to deter or defeat. For the first time in its history, the United States faces two nuclear peer competitors at once—Russia and China.<sup>12</sup> This differs drastically from the paradigm based on the bilateral U.S.–Soviet deterrence relationship during the Cold War. Although China also possessed nuclear weapons, its security interests were largely domestic rather than global. It maintained a limited nuclear capability, but the nature of U.S.–China relations was much different from the global contest between the U.S. and the Soviet Union.

This situation has changed with China’s rise as an economic power with global influence and

interests and its corresponding investments in power projection capabilities that include a modern nuclear weapons portfolio of increasing size. Unfortunately, China was not party to the gradual evolution of nuclear deterrence theory shaped by the U.S.–Soviet dynamic, nor has it ever been party to the various agreements governing nuclear matters between the Cold War competitors. Consequently, China operates with a different paradigm and introduces a third, unknown element into nuclear deterrence calculations.

A multipolar nuclear threat environment presents new and complex challenges. As a result, the assessment in this *Index* must be weighed against this emerging nuclear threat.

Russia is engaged in an aggressive nuclear expansion, having added several new nuclear systems to its arsenal since 2010. The United States is only beginning to modernize its existing nuclear systems, but Russia’s modernization effort is about 89 percent complete.<sup>13</sup> Russia also is developing such “novel technologies” as a nuclear-powered and nuclear-armed cruise missile, as well as a nuclear-armed unmanned underwater vehicle, and is arming delivery platforms with nuclear-tipped hypersonic glide vehicles.<sup>14</sup> Russia suspended the New Strategic Arms Reduction Treaty (New START) in February 2023, and the State Department reports that it is unable to verify that Russia is in compliance with the Treaty.<sup>15</sup>

In addition, Russia maintains a stockpile of at least 2,000 non-strategic nuclear weapons, unconstrained by any arms control agreement.<sup>16</sup> Defense Intelligence Agency Director Lieutenant General Robert Ashley has said that Russia is expected to increase this category of nuclear weapons—a category in which it “potentially outnumber[s]” the United States by 10 to 1.<sup>17</sup> This disparity is of special concern because Russia’s recent nuclear doctrine indicates a lower threshold for use of these tactical nuclear weapons. Russia has also been engaging in nuclear saber-rattling over its war on Ukraine, issuing both subtle and blatant nuclear threats in an attempt to coerce the West into not providing Ukraine with certain weapons systems and not engaging directly in the conflict.<sup>18</sup>

China is engaged in what Admiral Charles A. Richard, former Commander of U.S. Strategic Command (STRATCOM), has described as a “breathhtaking expansion” of its nuclear capabilities as part of a

strategic breakout that will require immediate and significant shifts in Department of Defense (DOD) capabilities and force posture.<sup>19</sup> According to Assistant Secretary of Defense for Space Policy John Plumb, China has established “a nascent nuclear triad” and, if its nuclear weapons modernization continues at its current pace, “could field an arsenal of about 1,500 warheads by 2035,”<sup>20</sup> which would be more than three times as large as its current estimated inventory of more than 400 warheads. In February 2023, current STRATCOM Commander General Anthony J. Cotton notified Congress that China now has more intercontinental ballistic missile (ICBM) launchers than the United States has.<sup>21</sup>

China is deploying hundreds of theater-range ballistic missiles that can strike U.S. bases and allied territory with precision, and many of these missiles can be fitted with either conventional or nuclear warheads. Beijing is also testing nuclear-capable hypersonic weapons including one that orbited the globe on a fractional orbital bombardment system (FOBS) before being released to glide to its target.<sup>22</sup> The DOD reports that “[t]he PLA is implementing a launch-on-warning posture, called ‘early warning counterstrike’...where warning of a missile strike leads to a counterstrike before an enemy first strike can detonate.”<sup>23</sup>

Combined with China’s refusal to discuss its forces or intent with the United States, this shift in posture increases the potential for mistakes and miscalculations.<sup>24</sup> Unlike the United States and Russia, which share a long history of communicating through arms control discussions and military-to-military contacts to reduce these types of risks, China has not participated in these measures. In fact, China refused to answer U.S. Secretary of Defense Lloyd Austin’s telephone call following the U.S. shutdown of China’s spy balloon in February 2023.<sup>25</sup> The magnitude of China’s nuclear expansion and qualitative upgrades has led senior U.S. leaders to conclude that China has become a nuclear peer to the United States and Russia and eventually could surpass U.S. nuclear capabilities.<sup>26</sup> China no longer has a minimum deterrence capability; instead, it “possesses the capability to employ any coercive nuclear strategy today.”<sup>27</sup>

In addition to having to contend with two nuclear peers, the United States must account for the nuclear threats posed by smaller state adversaries. North Korea is advancing its nuclear weapons and missile

capabilities. It continues to produce fissile material to build new nuclear weapons and has developed a new “monster” ICBM that allegedly is able to carry multiple warheads.<sup>28</sup> North Korea conducted an ICBM test in February 2023 in addition to testing what it claimed was a hypersonic missile during the past year.<sup>29</sup> It also revealed what appear to be tactical nuclear weapons that could be mounted on short-range missiles and used to threaten South Korea.<sup>30</sup>

In addition to being the world’s principal state sponsor of terrorism, Iran has managed to produce “high enriched uranium (HEU) particles containing up to 83.7% U-235”<sup>31</sup> and reportedly has acquired enough fissile material to produce a nuclear bomb.<sup>32</sup> A nuclear-armed Iran would have significant implications both for stability in the Middle East and for U.S. nonproliferation goals.

Finally, given the role of U.S. nuclear weapons in deterring strategic attacks (for example, attacks featuring the massive use of conventional, chemical, or biological weapons), it is important to consider non-nuclear threats posed by adversaries.

- Both Russia and China are deploying advanced conventional capabilities like conventionally armed hypersonic missiles and even conventionally armed cruise missiles that are capable of striking the U.S. homeland.<sup>33</sup>
- The United States “cannot certify” that China is in compliance with the Chemical Weapons Convention (CWC) and has certified that both Iran and Russia are in noncompliance with the CWC.<sup>34</sup>
- The United States has similar compliance concerns regarding the PRC’s and Iran’s adherence to the Biological Weapons Convention (BWC) and has found Russia to be in noncompliance with its BWC obligations.<sup>35</sup>
- North Korea also is in noncompliance with the BWC and “probably is capable of weaponizing BW agents with unconventional systems such as sprayers and poison pen injection devices, which have been deployed by North Korea for delivery of chemical weapons.”<sup>36</sup> It also is one of four states that “have neither ratified nor acceded to the CWC and, therefore, are not States Parties to the Convention.”<sup>37</sup>

Since the effects of these types of attacks can be strategic in nature and the United States does not possess chemical or biological weapons of its own, U.S. nuclear weapons will continue to play a role in deterring these threats.

### **Current U.S. Nuclear Capabilities and Maintenance Challenges**

To assess U.S. nuclear weapons capabilities, one needs to understand the current state of those capabilities and the challenges associated with maintaining them. The United States maintains a force posture based on the guidelines set forth by the New Strategic Arms Reduction Treaty signed with Russia in 2010.

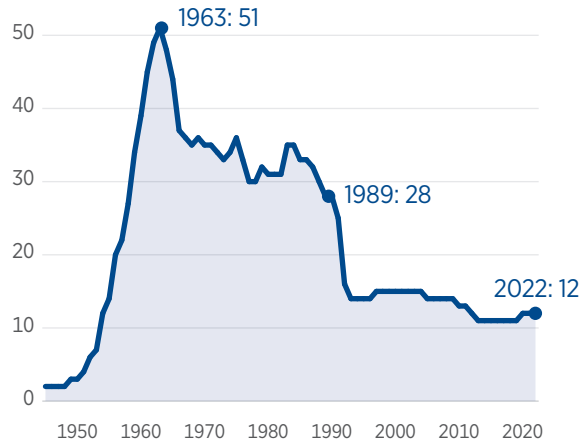
To abide by New START limits, the United States maintains 14 nuclear-armed *Ohio*-class ballistic missile submarines (SSBNs), each of which can be armed with as many as 20 Trident II D5 submarine-launched ballistic missiles (SLBMs); 400 single-warhead Minuteman III ICBMs deployed among 450 silos; and about 60 nuclear-capable B-52 and B-2 bombers that can be armed with gravity bombs or air-launched cruise missiles (ALCMs).<sup>38</sup> As of May 12, 2023, the United States was deploying 1,419 warheads under New START counting rules, which count each nuclear-capable bomber as one warhead.<sup>39</sup> Additionally, the United States maintains about 200 B61 tactical gravity bombs. About 100 of these bombs are deployed in Europe, and the remaining 100 are in central storage in the United States as backup, including for contingency missions not in Europe.<sup>40</sup>

The United States is working to modernize these nuclear forces, which are aged far beyond their original design lifetimes. U.S. nuclear delivery systems, warheads, and supporting infrastructure were all developed during the Cold War and have very little if any margin for further life extension or modernization delays. As summed up by Admiral Richards:

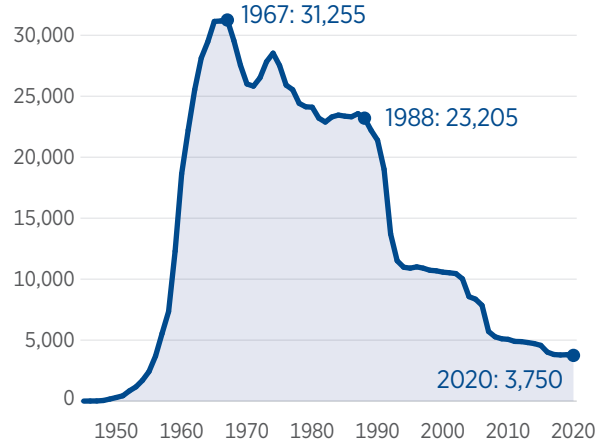
We are at a point where end-of-life limitations and the cumulative effects of underinvestment in our nuclear deterrent and supporting infrastructure leave us with no operational margin. The Nation simply cannot attempt to indefinitely life-extend leftover Cold War weapon systems and successfully support our National strategy. Pacing the threat requires dedicated and sustained funding for the entire nuclear enterprise and NC3 Next Generation modernization must be a priority.<sup>41</sup>

## A Smaller and Less Diverse Nuclear Arsenal

TYPES OF WARHEADS IN THE U.S. NUCLEAR STOCKPILE



TOTAL WARHEADS IN THE U.S. NUCLEAR STOCKPILE



**NOTE:** Quantities include deployed warheads and warheads in reserve, but the U.S. is limited by New START to only 1,550 deployed warheads.

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Faced with this set of circumstances, the United States must contend with three overarching challenges:

- The need to modernize its delivery systems and sustain the viability of its nuclear warheads,

- The need to refurbish an aging nuclear weapons infrastructure, and
- The need to recruit and train talented personnel to replace an aging workforce.

The current nuclear modernization program dates from 2010. The assumptions then were that

Russia was no longer an adversary and that the potential for great-power conflict was low.<sup>42</sup> Events over the past decade have proved these assumptions wrong. The extraordinary technical and geopolitical developments being realized today—China’s nuclear breakout and Russia’s demonstrated aggression, nuclear expansion, and nuclear coercion—were generally not anticipated as the Obama Administration went about finalizing the planned U.S. nuclear force structure for the coming decades.<sup>43</sup>

The United States is planning to replace its nuclear forces largely on a one-to-one basis instead of expanding or diversifying the current arsenal. In some cases, the current modernization program reduces potential capacity. The *Columbia*-class nuclear submarine, for example, will have eight fewer missile tubes than its predecessor, the *Ohio*-class—not to mention two fewer submarines.<sup>44</sup> The only significant change proposed in the 2010 nuclear modernization plans were the Trump Administration’s decisions to deploy W76-2 low-yield warheads for the SLBMs in 2020 (endorsed by the Biden Administration) and the proposed nuclear-armed sea-launched cruise missile (SLCM-N), the latter of which the Biden Administration has attempted to defund despite congressional support for the project.

To provide a hedge against adverse changes in a geopolitical situation like today’s, as well as against failures in the U.S. stockpile, the United States preserves an upload capability that allows it to increase the number of nuclear warheads on each type of its delivery vehicles. The U.S. Minuteman III ICBM, for example, is currently deployed with only one Mk12A/W78 warhead, but it can carry as many as three; the Trident II SLBM can carry several warheads at once; and the B-52 bomber can carry additional cruise missiles.<sup>45</sup>

The reduced number of missile tubes on the future *Columbia*-class SSBN will in turn reduce the strategic submarine force’s upload capacity unless more submarines are procured. Overall, U.S. hedge capacity is limited as uploading warheads onto the Minuteman III missiles would prove to be both time-consuming and costly. Exploiting the bomber upload capacity during peacetime would present a difficult challenge because bombers currently do not remain on alert. Uncertainty as to whether the United States will have enough deployable warheads or air-launched cruise missiles will remain another potential impediment to upload capacity.

The United States also maintains an inactive stockpile that includes near-term hedge warheads that “can serve as active ready warheads within prescribed activation timelines” and reserve warheads that can provide “a long-term response to risk mitigation for technical failures in the stockpile.”<sup>46</sup>

The United States has not designed or built a nuclear warhead since the end of the Cold War. Instead, the Department of Energy’s National Nuclear Security Administration (NNSA) uses life-extension programs (LEPs) to extend the service lives of existing nuclear warheads in the stockpile, some of which date back to the 1960s. While LEPs replace or upgrade most components in a nuclear warhead, all warheads will eventually need to be replaced because their nuclear components—specifically, plutonium pits that comprise the cores of warheads—are also subject to aging.<sup>47</sup> The United States is the only nuclear state that lacks the capability to produce plutonium pits in quantity. The NNSA’s fiscal year (FY) 2024 budget request notes a 10 percent increase for “Weapons Activities” to “continue restoring production capability, including the capability to produce 80 plutonium pits per year (ppy) as close to 2030 as possible.”<sup>48</sup>

Demographic challenges within the nuclear weapons labs also affect the ability of the U.S. to modernize its warhead stockpile. Because most scientists and engineers with practical hands-on experience in nuclear weapons design and testing are retired, the certification of weapons that were designed and tested as far back as the 1960s depends on the scientific judgment of designers and engineers who have never been involved in either the testing or the design and development of nuclear weapons. In recent years, the NNSA has invested in enabling its workforce to exercise critical nuclear weapons design and development skills—skills that have not been fully exercised since the end of the Cold War—through the Stockpile Readiness Program. These skills must be available when needed to support modern warhead development programs for SLBMs and ICBMs.

The shift in emphasis away from the nuclear weapons mission after the end of the Cold War led to a diminished ability to conduct key activities at the nuclear laboratories. According to NNSA Administrator Jill Hruby, “workforce recruiting and retention programs have helped us turn the tide of attrition post-Covid,” and the budget request

reflects the Administration's commitment to a "safe, secure, and reliable stockpile."<sup>49</sup> The NNSA continues to struggle with infrastructure recapitalization, as "[m]ore than 60 percent [of its facilities] are beyond their life expectancy, with some of the most important dating back to the Manhattan Project."<sup>50</sup> Because of this neglect, NNSA must now recapitalize the nuclear weapons complex at the same time the nation faces the need to modernize its aging nuclear warheads.

In recent years, bipartisan congressional support for the nuclear mission has been strong, and nuclear modernization has received additional funding. Preservation of that bipartisan consensus will be critical as these programs mature and begin to introduce modern nuclear systems to the force.

In FY 2023, the Biden Administration, supported by Congress, advanced the comprehensive modernization program for nuclear forces that was initiated by President Barack Obama and continued by the Trump Administration. Despite some opposition, Congress funded the two previous Presidents' budget requests for these programs as well. Because such modernization activities require consistent, stable, long-term funding commitments, this continued bipartisan support has been critical.

The NNSA received \$22.2 billion in FY 2023, which was about \$1.5 billion more than it received in FY 2022 and included full funding for major efforts like modernization of plutonium pit production and five warhead modernization programs. The FY 2024 budget would continue these efforts with an NNSA topline of \$23.8 billion.<sup>51</sup> The FY 2024 budget also supports modernization programs to replace the triad, including the Sentinel ICBM weapon system; Long Range Stand Off Weapon cruise missile (LRSO); *Columbia*-class nuclear submarine; and B-21 Raider bomber.

In FY 2023, Congress also provided funding to begin research and development on a nuclear-armed, sea-launched cruise missile (SLCM-N), which, driven by the worsened security environment with Russia and China, had been proposed in the 2018 NPR.<sup>52</sup> However, the Biden Administration removed funding for this capability in its FY 2023 and FY 2024 budget requests. Despite the Administration's opposition, the Congress authorized \$25 million for the program on a bipartisan basis in the FY 2023 defense budget.<sup>53</sup>

## Assessing U.S. Nuclear Force Capacity

To assess the military services, other sections in this *Index* use a combination of government strategies or assessments and historical data based on capacity and capabilities that the United States has needed to fight wars in the past. For example, using data from four previous wars and strategies over time, this *Index* assesses Army Brigade Combat Team (BCT) capacity based on a total of 50 BCTs required to deal with two major regional conflicts.<sup>54</sup>

Assessing the capacity of U.S. nuclear weapons, however, presents several serious difficulties. Because a nuclear war has never been fought, there are no historical data that can be used to determine a baseline for how much nuclear capability the United States needs. The only time nuclear weapons have been used was in 1945 when the U.S. bombed Hiroshima and Nagasaki, but that does not provide any information on how much nuclear capability is needed because the United States was the only nuclear-weapon state and did not yet maintain a functioning nuclear arsenal.

Moreover, since deterrence depends on an adversary's perception of a threat as credible, it is very difficult to quantify how many warheads, and on how many and what types of platforms, the United States needs to *deter* an adversary. Deterrence requires (1) an understanding of what an adversary values and (2) the ability to threaten that adversary so credibly that he refrains from acting against U.S. interests, thereby jeopardizing what he values. The size of the nuclear force that the U.S. needed to deter the Soviet Union during the Cold War is not a good approximate metric because today's environment is much different and there are more nuclear-armed powers than there were then.<sup>55</sup>

Nevertheless, it is possible to draw some conclusions about the adequacy of the current U.S. nuclear force's size and structure. A force that is sized to deter only one nuclear peer is not likely to be sufficient to deter two nuclear peers—in this case, both Russia and China, particularly given their emerging cooperative relationship. Consensus during the early years of the Obama Administration centered around the assessment that Russia was the primary nuclear threat, that China would likely not alter its minimum deterrence posture, and that nuclear proliferation in Iran or an India–Pakistan nuclear conflict would dominate future nuclear threats.<sup>56</sup> Then-STRATCOM Commander General Kevin

Chilton testified in 2010 that “the arsenal that we have is exactly what is needed today to provide the deterrent.”<sup>57</sup> Given the changes of the past 10 years, however, a nuclear force that was capable of countering the threats we faced in 2010 is not likely to be capable of countering the threats we will face in the near future.

There is a direct relationship between adversary capabilities and what the U.S. needs for deterrence. Fundamental to the concept of deterrence is the ability to hold at risk the assets that our adversaries value most, including their nuclear forces and accompanying infrastructure. For deterrence to be credible, the United States must maintain the numbers and types of survivable nuclear weapons it needs to convince adversaries that it can strike valued targets if necessary. Given the increase in targets resulting from China’s, Russia’s, and North Korea’s nuclear expansion and their potentially cooperative relationship against U.S. and allied interests, the United States will likely have to increase the number of its operationally deployed nuclear weapons.

This deficiency in capacity is particularly acute in the category of non-strategic nuclear weapons: short-range, typically lower-yield nuclear weapons that can be deployed to a region of conflict as opposed to ICBMs launched from the homeland or SSBNs that remain at sea. Russia maintains an arsenal of about 2,000 non-strategic nuclear weapons. China maintains an arsenal of hundreds of nuclear-capable medium-range to intermediate-range missiles deployed in the Indo-Pacific. Reportedly, the United States deploys about 100 tactical weapons in NATO states and no nuclear weapons in the Indo-Pacific.

The 2018 NPR studied these disparities and assessed that the United States needed two supplemental capabilities—the W76-2 and SLCM-N—to rectify this imbalance. The United States fielded the W76-2, but the future of the SLCM-N remains uncertain. Meanwhile, this disparity has worsened since the 2018 NPR. In April 2022, Admiral Richard wrote in a letter to Congress that “the current situation in Ukraine and China’s nuclear trajectory convinces me a deterrence and assurance gap exists.”<sup>58</sup>

Despite this assessment, however, current STRATCOM Commander General Anthony Cotton has stated only that an SLCM-N “is one of several possible nuclear or conventional capabilities

the U.S. could develop to enhance strategic deterrence.”<sup>59</sup> Other Biden Administration officials, including Secretary of Defense Lloyd Austin and Secretary of the Navy Admiral Carlos Del Toro, have testified in favor of cancelling the program.<sup>60</sup> On the other hand, the SLCM-N has won support from:

- Admiral Charles A. Richard, former Commander, U.S. Strategic Command;
- General Mark A. Milley, Chairman, Joint Chiefs of Staff;
- Admiral Christopher W. Grady, Vice Chairman, Joint Chiefs of Staff;
- General Tod D. Wolters, former Commander, U.S. European Command; and
- Admiral Michael M. Gilday, Chief of Naval Operations.<sup>61</sup>

The combination of what Admiral Richard calls a “deterrence and assurance gap” and the sheer numerical difference between the United States and its adversaries in non-strategic and intermediate-range forces would certainly seem to justify a poor score for the capacity of America’s nuclear force, but there is a question that remains unanswered: How much more does the United States need to account for the drastic change in the Chinese nuclear threat, Russia’s continuing expansion, and a growing nuclear arsenal in North Korea? In addition to the inherent constraints on determining a baseline for nuclear weapons capacity, it would be hard to determine what an ideal force posture would look like in a three-party nuclear dynamic.

For now, according to Admiral Richard, the United States is “furiously” rewriting deterrence theory to account for this dynamic—a difficult exercise because “[e]ven our operational deterrence expertise is just not what it was at the end of the Cold War. So we have to reinvigorate this intellectual effort.”<sup>62</sup> The process is ongoing, but at a minimum, the United States should retain one of its primary sizing metrics for its force posture: being able to withstand an adversary’s first strike and still respond in a way the adversary would deem unacceptable. In an environment that includes two peer competitors rather than just one, the United States will need to decide



whether the planned nuclear force can still meet that requirement, especially given the possibility of Russian and Chinese cooperation or coordination.

This *Index* therefore concludes that U.S. nuclear weapons capacity is insufficient to face two nuclear peers at once but does not assign a score in this category. This may change in future editions.

### U.S. Nuclear Weapons Assessment

In rating America's military services, this *Index* focuses on capacity, capability, and readiness. In assessing our nuclear forces, however, this *Index* focuses on several components of the existing nuclear weapons enterprise. This enterprise includes warheads, delivery systems, and the physical infrastructure that maintains U.S. nuclear weapons. It also includes the talent of people—the nuclear designers, engineers, manufacturing personnel, planners, maintainers, and operators who help to ensure the U.S. nuclear deterrent—and additional elements like nuclear command and control; intelligence, surveillance, and reconnaissance (ISR); and aerial refueling, all of which also play a major role in conventional operations.

Many factors make such an assessment difficult, but two stand out.

- There is a lack of detailed publicly available data about the readiness of nuclear forces, their capabilities, and the reliability of the warheads that delivery systems carry.
- Many components that comprise the nuclear enterprise are also involved in supporting conventional missions. For example, U.S. strategic bombers perform a significant conventional mission and do not fly airborne alert with nuclear weapons today as they did routinely during the 1960s. Thus, it is hard to assess whether any one piece of the nuclear enterprise is sufficiently funded, focused, and/or effective with regard to the nuclear mission.

An additional challenge is the nature of media coverage. When information surfaces in the media, it is usually news of problems and mishaps; excellence is par for the course and therefore apparently not worth the effort it would take to report on it.

With these difficulties in mind, this assessment considers seven factors that are deemed the

most important elements of the nuclear weapons enterprise:

- Reliability of the current U.S. nuclear stockpile,
- Reliability of current U.S. delivery systems,
- Nuclear warhead modernization,
- Nuclear delivery systems modernization,
- Nuclear weapons complex,
- Personnel challenges within the national nuclear laboratories, and
- Allied assurance.

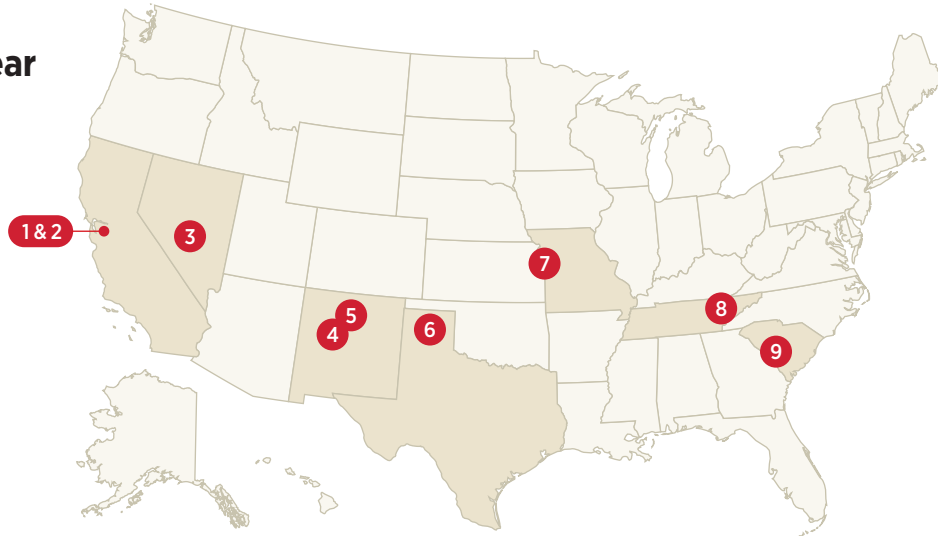
These factors are judged on a five-grade scale that ranges from “very strong” (defined as meeting U.S. national security requirements or having a sustainable, viable, and funded plan in place to do so) to “very weak” (defined as not meeting current security requirements and with no program in place to redress the shortfall). The other three possible scores are “strong,” “marginal,” and “weak.”

### Reliability of Current U.S. Nuclear Stockpile Score: Strong

U.S. warheads must be safe, secure, effective, and reliable. The Department of Defense defines reliability as “the probability that a weapon will perform in accordance with its design intent or military requirements.”<sup>63</sup> Since the cessation of nuclear testing in 1992 and the follow-on debate about the Comprehensive Test Ban Treaty (rejected by the Senate in 1999), reliability has been assessed and maintained through the NNSA's Stockpile Stewardship Program (SSP), which consists of an intensive warhead surveillance program; non-nuclear experiments (experiments that do not produce a nuclear yield); sophisticated calculations using high-performance computing; and related annual assessments and evaluations. America and its allies must have high confidence that U.S. nuclear warheads will perform as expected.

Over time, the number and diversity of nuclear weapons in the stockpile have decreased. The result is a smaller margin of error if all of one type are affected by a technical problem that might cause a

## U.S. Nuclear Weapons Complex



**1 Lawrence Livermore National Laboratory**

*Livermore, CA*  
Nuclear weapons R&D

**2 Sandia National Laboratories**

*Livermore, CA*  
Nuclear weapons R&D and systems engineering

**3 Nevada National Security Site**

*Nye County, NV*  
Subcritical experiments and test readiness

**4 Sandia National Laboratories**

*Albuquerque, NM*  
Nuclear weapons R&D and systems engineering

**5 Los Alamos National Laboratory**

*Los Alamos, NM*  
Nuclear weapons R&D and plutonium pit production

**6 Pantex Plant**

*Panhandle, TX*  
Assembly of nuclear warheads

**7 Kansas City Plant**

*Kansas City, MO*  
Production of non-nuclear components for nuclear warheads

**8 Y-12 National Security Complex**

*Oak Ridge, TN*  
Manufacture of highly enriched uranium parts for nuclear warheads

**9 Savannah River Site**

*Aiken, SC*  
Pit production and tritium production

SOURCE: Heritage Foundation research.

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weapon type or its delivery system to be sidelined for repair or decommissioned. Despite generating impressive amounts of knowledge about nuclear weapons physics and materials chemistry, the United States could find itself surprised by unanticipated long-term effects on a nuclear weapon's aging components. "The scientific foundation of assessments of the nuclear performance of US weapons is eroding as a result of the moratorium on nuclear testing," argue John Hopkins, nuclear physicist and a former leader of the Los Alamos National Laboratory's nuclear weapons program, and David Sharp, former Laboratory Fellow and a guest scientist at the Los Alamos National Laboratory.<sup>64</sup>

The United States currently has a safe and secure stockpile, but concerns about overseas storage sites, potential problems introduced by improper

handling, or unanticipated effects of aging could compromise the integrity or reliability of U.S. warheads. The nuclear warheads themselves contain security systems that are designed to make it difficult if not impossible to detonate a weapon without proper authorization. Some U.S. warheads have modern safety features that provide additional protection against accidental detonation; others do not because those safety features could not be incorporated absent yield-producing experiments.

**Grade:** Absent an ability to conduct yield-producing experiments, the national laboratories' assessment of weapons reliability, based on the full range of surveillance, scientific, and technical activities carried out in the NNSA Stockpile Stewardship Program, depends on the expert judgment of the laboratories' directors and the weapons scientists

and engineers on their staffs. This judgment is based on experience, non-nuclear experimentation, and extensive modeling and simulation. It does not benefit from data that could be obtained through yield-producing experiments or nuclear weapons testing, which was used in the past to validate that warheads performed as designed and to certify potential fixes to any problem identified by such testing.

The United States maintains the world's most advanced Stockpile Stewardship Program and continues to make scientific and technical advances that help to certify the stockpile. The FY 2024 budget request for the Stockpile Research, Technology, and Engineering program is \$3.2 billion, approximately \$100 million of which "is for the Z-pinch Experimental Underground System (Zeus) Test Bed Facilities Improvement Project and the Advanced Sources and Detectors Scorpius radiography capability, which provide the main capabilities within Enhanced Capabilities for Subcritical Experiments at the Nevada National Security Site (NNSS)."<sup>65</sup>

Such advanced capabilities can help the NNSA to certify the stockpile more accurately and without testing, but according to Admiral Richard, confidence in the stockpile requires two other components in addition to the Stockpile Stewardship Program:

[Y]ou have to have a flexible and modern stockpile, which means we need to move past life extensions, which we have been doing for 30 years, and move into refurbishments, which is where NNSA is about to go. And...[y]ou have to have a modern, responsive, and resilient infrastructure, and we have delayed too long, in my opinion, giving NNSA the resources necessary to do that piece.<sup>66</sup>

To assess the reliability of the nuclear stockpile annually, each of the three nuclear weapons labs (the Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratory) reports its findings with respect to the safety, security, and reliability of the nation's nuclear warheads to the Secretary of Energy and the Secretary of Defense, who then brief the President. Detailed classified reports are provided to Congress as well. The Commander of U.S. Strategic Command also assesses overall nuclear weapons

system reliability, including the reliability of both warhead and delivery platforms.

In spite of concerns about aging warheads, according to the NNSA's Stockpile Stewardship and Management Plan (SSMP) for FY 2023:

In 2021, DOE/NNSA...conducted surveillance activities for all weapon systems using data collection from flight tests, laboratory tests, and component evaluations to assess stockpile reliability without explosive nuclear testing, which culminated in completion of all annual assessment reports and generation of laboratory director letters to the President.<sup>67</sup>

Additionally, when asked in a congressional hearing whether she "agree[s] that there is not a current or foreseeable need for the United States to resume explosive nuclear testing that produces nuclear yields," Administrator Hruby responded, "Yes...I do. And I would just go further to say our entire Stockpile Stewardship Program is designed around the principal [sic] that we will make sure we understand weapons enough so that we do not have to test."<sup>68</sup>

Based on the results of the existing method used to certify the stockpile's effectiveness, we grade the U.S. stockpile conditionally as "strong." This grade, however, will depend on whether support for an adequate stockpile, both in Congress and in the Administration, remains strong.

### **Reliability of Current U.S. Delivery Systems Score: Marginal**

Reliability encompasses strategic delivery vehicles in addition to the warhead. For ICBMs, SLBMs, and ALCMs, this requires a successful missile launch, including the separation of missile boost stages, performance of the missile guidance system, separation of the reentry vehicles from the missile post-boost vehicle, and accuracy of the final reentry vehicle in reaching its target.<sup>69</sup> It also entails the ability of weapons systems (cruise missiles, aircraft carrying bombs, and reentry vehicles) to penetrate adversary defensive systems and reach their targets.

The United States conducts flight tests of ICBMs and SLBMs every year to ensure the reliability of its delivery systems with high-fidelity "mock" warheads. Anything from faulty electrical wiring to booster separations could degrade the reliability

and safety of the U.S. strategic deterrent. U.S. strategic long-range bombers also regularly conduct exercises and receive upgrades to sustain a demonstrated high level of combat readiness. The Air Force tested the AGM-86B ALCM, launched from the B-52H bomber, most recently in 2017.<sup>70</sup> The DOD must upgrade existing platforms and develop their replacement programs simultaneously, sometimes in concurrence with the NNSA's work on nuclear warheads.

**Grade:** In July 2018, the Air Force conducted its first unsuccessful ICBM test since 2011,<sup>71</sup> but it has conducted several successful tests since then, including a test in August 2020 that launched a missile armed with three reentry vehicles<sup>72</sup> and its most recent test, which was conducted in April 2023.<sup>73</sup> The May 2021 test was marred by a ground abort before launch, and this has provoked speculation about the reliability of the Minuteman III missile as it approaches its retirement, which is scheduled to begin in 2029.<sup>74</sup> Additionally, the DOD canceled a Minuteman III test scheduled for March 2022 “in a bid to lower nuclear tensions with Russia.” An SLBM test in 2022 was successful.<sup>75</sup>

To the extent that data from these tests are publicly available, they provide objective evidence of the delivery systems' reliability and send a message to U.S. allies and adversaries alike that U.S. systems work and that the U.S. nuclear deterrent is ready if needed. The aged systems, however, occasionally have problems, as evidenced by the failed July 2018 and May 2020 Minuteman III launches.

The evidence indicates that some U.S. delivery systems may have difficulty penetrating an adversary's advanced defensive systems. Because of its obsolescence against Russian air defense systems, for example, the B-52H bomber already no longer carries gravity bombs.<sup>76</sup> Despite the fact that the ALCM passed its most recent public test in 2017, then-STRATCOM Commander General John Hyten has stated that because of its age, “it's a miracle that [the missile] can even fly” and that the current ALCMs “do meet the mission, but it is a challenge each and every day.”<sup>77</sup> Other U.S. systems suffer from similar challenges. Admiral Richard has stated that “I need a weapon that can fly and make it to the target. Minuteman-III is increasingly challenged in its ability to do that.”<sup>78</sup>

As Russian and Chinese air and missile defenses and other anti-platform capabilities advance, the

challenge for U.S. offensive systems will become greater unless the United States deploys modernized delivery systems. In addition to advanced air defense systems like the S-400, which contributed to the decision that the B-52H bomber should no longer carry gravity bombs, both Russia and China are placing a greater emphasis on long-range ballistic missile defense. Russia is modernizing its long-range interceptors—and reportedly has dozens more than the United States has—and China's missile defense capabilities, while mostly focused on regional threats, “appear to be developing towards countering long-range missiles.”<sup>79</sup> As U.S. delivery systems approach obsolescence, adversary air and missile defense increasingly calls into question the ability of U.S. weapons to strike their targets. The Biden Administration's decision to retire the B83 nuclear warhead potentially leaves the United States with a gap in its ability to reach adversaries' hard and deeply buried targets.

Both adversary defenses and system aging will continue to affect delivery platform reliability until platforms are replaced. Adversary improvements in defensive systems and decisions by the current Administration to cancel, curtail, or delay delivery platform modernization programs combine to lower the score for delivery systems reliability in this year's edition of the *Index* from “strong” to “marginal.”

## Nuclear Warhead Modernization

### Score: Marginal

During the Cold War, the United States focused on designing and developing modern nuclear warheads to counter Soviet advances and modernization efforts and to leverage advances in our understanding of the physics, chemistry, and design of nuclear weapons. Today, the United States focuses on extending the life of its aging stockpile rather than on fielding modern warheads while trying to retain the skills and capabilities needed to design, develop, and produce such warheads. Relying only on sustaining the aging stockpile could increase the risk of failure caused both by aging components and by not exercising critical skills. It also could signal to adversaries that the United States is less committed to nuclear deterrence.

Adversaries and current and future proliferators are not limited to updating Cold War designs and can seek designs outside of U.S. experiences, taking

advantage of more advanced computing technologies and scientific developments that have evolved since the end of the Cold War. Other nations can maintain their levels of proficiency by developing new nuclear warheads.<sup>80</sup> In 2020, the Department of State reported that “Russia has conducted nuclear weapons experiments that have created nuclear yield and are not consistent with the U.S. ‘zero-yield’ standard” and that there is evidence of China’s potential lack of adherence to this standard as well.<sup>81</sup> In 2023, the department noted that “concerns remain about the nature of both China and Russia’s adherence to their respective moratoria.”<sup>82</sup>

Fortunately, the NNSA has made noticeable improvements in this category in recent years. Since 2016, Congress has funded the Stockpile Responsiveness Program (SRP) to “exercise all capabilities required to conceptualize, study, design, develop, engineer, certify, produce, and deploy nuclear weapons.”<sup>83</sup> Congress funded the SRP at \$70 million in FY 2020, FY 2021, and FY 2022.<sup>84</sup> The FY 2023 enacted level was \$63.7 million, and the Administration is requesting \$69.8 million (an increase of \$6.1 million) for FY 2024.<sup>85</sup> The SRP has demonstrated some important accomplishments in ensuring critical skills retention, and scientists at the national labs have responded to it with enthusiasm.

Ongoing work at the national labs to design nuclear warheads could build on the SRP’s success. Starting in FY 2021, Congress has appropriated funding for the W93/Mark 7 warhead program, which will replace the W76-1 and W88 warheads carried by the Trident II D5 SLBMs.<sup>86</sup> The final amount enacted for FY 2021 was \$53,000,000.<sup>87</sup> The program was funded at a level of \$241 million in FY 2023 and entered its second phase (Feasibility Study and Design Options) in February 2022. The FY 2024 request for \$390 million reflects the activities associated with Phase 2 and “improved cost estimates.”<sup>88</sup> The NNSA is also developing the W87-1 warhead for the Sentinel missile, which is a modification of the existing W87-0 design.

These programs may allow American engineers and scientists to improve previous designs, including meeting evolving military requirements (for example, adaptability to emerging threats and the ability to hold hard and deeply buried targets at risk). Future warheads could improve reliability while also enhancing the safety and security of American weapons, but the question remains: How

much of this work can be done without yield-producing experiments? The nuclear enterprise displayed improved flexibility when it produced the W76-2 warhead, a low-yield version of the W76 warhead. The W76 warhead was modified within a year to counter Russia’s perception of an exploitable gap in the U.S. nuclear force posture.

The ability to produce plutonium pits, which compose the core of all nuclear weapons, will be critical to warhead modernization efforts. The NNSA currently cannot produce plutonium pits at scale and is undergoing an effort to restore this capability with a statutory requirement to produce 80 pits per year by 2030—a requirement that the NNSA will not be able to meet. The new goal has shifted to somewhere from the first quarter of FY 2032 to the fourth quarter of FY 2035.<sup>89</sup> It is planned that “the W87-1 program and subsequent modernization programs” will use these new pits.<sup>90</sup>

**Grade:** Before the score for this category can move up to “strong,” the NNSA, with support from Congress, will need to achieve enough progress with the W93/Mk 7 and W87-1 and minimize delays in pit production. Delays in pit production could require modern warheads to use older pits, further jeopardizing both the functioning of those systems and the credibility of the U.S. deterrent. The NNSA eventually will also need to begin programs for future land-based, sea-based, and air-delivered warheads, all of which currently remain notional, to succeed the current programs beyond 2030.<sup>91</sup>

Moreover, future assessments will need to examine whether the NNSA’s current warhead modernization effort is sufficient to address the increasing threat. For instance, despite Russian progress in hardening and deeply burying facilities to withstand strikes by current U.S. weapons, an earth-penetrating warhead is not part of the NNSA’s warhead modernization plan.<sup>92</sup> The Biden Administration’s proposal to cancel the plan, which would keep the B83 gravity bomb (currently the only warhead capable of striking hard and deeply buried targets) beyond its planned retirement, could create a capability gap.<sup>93</sup>

For now, the score for this category remains at “marginal.”

### **Nuclear Delivery Systems Modernization Score: Strong but Trending Toward Marginal**

All U.S. delivery systems were built during the Cold War and are overdue for replacement. The

Obama Administration, in consultation with Congress, initiated a plan to replace current triad delivery systems. President Donald Trump advanced this modernization program with bipartisan support from Congress. Under this program:

- The Navy is fully funding the *Columbia*-class submarine to replace the *Ohio*-class submarine;
- The Air Force is funding the B-21 Raider Long-Range bomber, which will replace conventionally armed bombers before the new aircraft is certified to replace nuclear-capable bombers;
- The Long-Range Standoff weapon will replace the aging ALCM;
- Existing Minuteman III ICBMs are expected to remain in service beyond the end of the decade—50 years after their intended lifetime—and to be replaced by the Sentinel weapon system beginning in 2029;
- Existing Trident II D5 SLBMs have been life-extended to remain in service until 2042 through the end of the last *Ohio*-class submarine's lifetime; and
- The F-35 will replace the existing F-15E Dual Capable Aircraft that will carry the B61-12 gravity bomb.<sup>94</sup>

These programs face high risks of delay. The U.S. Government Accountability Office (GAO) has reported that the “Sentinel is behind schedule due to staffing shortfalls, delays with clearance processing, and classified information technology infrastructure challenges” and “is experiencing supply chain disruptions, leading to further schedule delays.”<sup>95</sup> Moreover, these programs are entering a new phase of risk as they move from initial research and development to testing<sup>96</sup> and then procurement.

These scheduling risks are especially dangerous because years of deferred recapitalization have left modernization programs with no margin for delay. For instance, although the *Columbia*-class SSBN currently remains on schedule, the transition from the *Ohio* to the *Columbia* is so fragile that, according to Admiral Johnny Wolfe, “[d]elays to the Navy’s

SSBN modernization plan are not an option.”<sup>97</sup> In an effort to keep the program on track, the shipbuilder reassigned workers from the *Virginia*-class attack submarine to the *Columbia*-class program, causing delays in the former.<sup>98</sup>

The effects of failing to replace current systems before their planned retirement dates are significant. As systems like the Minuteman III, ALCM, and *Ohio*-class submarines continue to age, efforts to sustain their required levels of performance become increasingly difficult and expensive. Age degrades reliability by increasing the potential for systems to break down or fail to perform correctly. Defects can have serious implications for U.S. deterrence and assurance. Should Sentinel fail to reach initial operating capability by 2029, the United States will be left with a less capable ICBM fleet, which will also begin to dip below 400 missiles as the Air Force continues to use missiles for annual testing. With respect to the Navy, the GAO has reported that if the first *Columbia*-class submarine is not delivered on time, “the Navy will have insufficient submarines available to meet the additional USSTRATCOM force-generation operational requirement of a total of 10 submarines,”<sup>99</sup> which means less presence at sea.

**Grade:** U.S. nuclear platforms are in dire need of recapitalization. Plans for modernization of the nuclear triad are in place, and Congress and the services have largely sustained funding for these programs. The Sentinel ICBM remains on track for a flight test in 2023.<sup>100</sup> In July 2021, the Air Force awarded Raytheon an engineering and manufacturing development contract for the LRSO, which also appears to remain on schedule.<sup>101</sup> However, the fragility of these programs keeps them at risk of technical or funding delays, including appropriations through continuing resolutions.

The rapid modernization and expansion of nuclear forces underway in Russia and China clearly signal that U.S. efforts should receive similar attention and be undertaken with a commensurate sense of urgency. Growth in adversary forces has a direct impact on the required size of U.S. forces, including nuclear forces. The United States should consider procuring more of these modern systems than originally planned.

The United States will also need to consider acquiring additional capabilities to ensure that deterrence is tailored to the evolving Russian threat and

the new Chinese threat. The SLCM-N, if it continues to receive funding from Congress, would begin to meet this challenge by providing the President with an option to respond more proportionally to—and therefore help deter—an adversary’s limited employment of nuclear weapons in a theater of conflict.

For now, replacing current systems remains the top priority, and while the commitment to nuclear weapons modernization demonstrated by Congress and the Administration is commendable, this category is trending toward “marginal” because of threat developments and delays (or the strong potential for delays) in U.S. modernization programs.

### **Nuclear Weapons Complex Score: Marginal**

Maintaining a reliable and effective nuclear stockpile depends in large part on the facilities where U.S. devices and components are developed, tested, and produced. These facilities constitute the foundation of our strategic arsenal and include:

- The Los Alamos National Laboratories (nuclear weapons research and development, or R&D, and plutonium pit production);
- The Lawrence Livermore National Laboratories (nuclear weapons R&D);
- The Sandia National Laboratory (nuclear weapons R&D and systems engineering);
- The Nevada National Security Site (subcritical experiments, test readiness);
- The Pantex Plant (assembly of nuclear warheads);
- The Kansas City Plant (production of non-nuclear components for nuclear warheads);
- The Savannah River Site (second site for pit production and tritium production); and
- The Y-12 National Security Complex (manufacture of highly enriched uranium parts for nuclear warheads).

These complexes design, develop, test, and produce the weapons in the U.S. nuclear arsenal, and

their maintenance is therefore of critical importance. In the words of NNSA Administrator Jill Hruby, “A well-organized, well-maintained, and modern infrastructure system is the bedrock of a flexible and resilient nuclear security enterprise.”<sup>102</sup> It contributes to deterrence by enabling the United States to adapt its nuclear arsenal to shifting requirements, signaling to adversaries that the United States can adjust its warhead capacity or capabilities when needed. Maintaining a safe, secure, effective, and reliable nuclear stockpile requires modern facilities, technical expertise, and tools both to repair any malfunctions quickly, safely, and securely and to produce new nuclear weapons when they are needed.

The existing nuclear weapons complex, however, is not capable of producing some of the nuclear components needed to maintain and modernize the stockpile on timelines that would be required for flexibility and resilience.<sup>103</sup> Significantly, the United States has not had a substantial plutonium pit production capability since 1993. The U.S. currently retains more than 5,000 old plutonium pits in strategic reserve in addition to pits for use in future LEPs, but uncertainties regarding the effect of aging on plutonium pits and how long the United States will be able to depend on them before replacement remain unresolved. In 2006, a JASON Group study of NNSA assessments of plutonium aging estimated that, depending on pit type, the minimum pit life was in the range of 100 years.<sup>104</sup> A work program was recommended to address additional uncertainties in pit aging but did not reach fruition. In addition to the pits needed for warheads like the W87-1 and W93, numerous pits have been in the stockpile for decades—some for more than 50 years—and will need to be replaced.

Today, the production rate is too low to meet the need to replace aging pits. The United States manufactured 10 W87-1 development pits in 2022.<sup>105</sup> Statutory law requires the United States to produce no fewer than 80 pits per year (ppy) by 2030. In April 2021, the NNSA reached the first critical milestone for pit production at the Los Alamos National Laboratory.<sup>106</sup> A second plutonium pit production facility is being planned to exploit the now-cancelled Mixed Oxide Fuel (MOX) facility that was being constructed at the Savannah River Site in South Carolina. Savannah River has a required production of no fewer than 50 ppy by 2030. It is already clear

that the NNSA will not be able to meet the required deadline; rather, the organization states that it “remains firmly committed to achieving 80 ppy as close to 2030 as possible.”<sup>107</sup>

The GAO recently found that the “NNSA has not developed either a comprehensive schedule or a cost estimate” for the nation’s plan to reestablish plutonium pit production.<sup>108</sup> These tools would improve the management of an already delayed program.<sup>109</sup>

Aside from plutonium, the NNSA must maintain production of several other key materials and components that are used to build and maintain nuclear weapons. For instance, it plans to increase the supply of tritium as demand increases. Because tritium is always decaying at a half-life of 12 years, delays in tritium production only increase the need to produce a timely replacement.<sup>110</sup> The site preparations for the Tritium Finishing Facility began in FY 2023.<sup>111</sup> Other projects currently underway include a new lithium processing facility and the new Uranium Processing Facility at Y-12.

Added to these considerations is the fact that 58 percent of the NNSA’s 5,000 facilities are more than 40 years old, and more than half are in poor condition.<sup>112</sup> As a consequence, the NNSA had accumulated about \$6.1 billion in deferred maintenance as of FY 2021.<sup>113</sup>

The NNSA has described high deferred maintenance as “a sign that infrastructure is in poor condition and in need of modernization” because of a lack of “significant, sustained, and timely funding.”<sup>114</sup> Aging facilities also have become a safety hazard: In some buildings, for example, chunks of concrete have fallen from the ceiling.<sup>115</sup> Moreover, without modern and functioning NNSA facilities, the U.S. will gradually lose the ability to conduct the high-quality experiments that are needed to ensure the reliability of the stockpile without nuclear testing.

Finally, despite the self-imposed nuclear testing moratorium that the United States has had in place since 1992, a functioning nuclear weapons complex requires a low level of nuclear test readiness. “Test readiness” refers to a single test or a very short series of tests, not a sustained nuclear testing program, reestablishment of which would require significant additional resources.

Since 1993, the NNSA has been mandated to maintain a capability to conduct a nuclear test within

24 to 36 months of a presidential decision to do so.<sup>116</sup> Whether this approach can assure that the United States has the timely ability to conduct instrumented yield-producing experiments to correct a flaw in one or more types of its nuclear warheads is open to question. The United States might need to test to assure certain warhead characteristics that only nuclear testing can validate, or it might desire to conduct a nuclear weapon test for policy reasons.

However, the NNSA has been unable to achieve even this goal. According to the FY 2018 SSMP, it would take 60 months to conduct “a test to develop a new capability.”<sup>117</sup> And according to the FY 2022 SSMP, “Assuring full compliance with domestic regulations, agreements, and laws related to worker and public safety and the environment, as well as international treaties would significantly extend the time required for execution of a nuclear test.”<sup>118</sup> Because the United States is rapidly losing its remaining real-life nuclear testing experience, including instrumentation of very sensitive equipment, the process would likely have to be reinvented.<sup>119</sup>

Test readiness has not been funded as a separate program since FY 2010 and is instead supported by the Stockpile Stewardship Program that exercises testing elements at the Nevada National Security Site and conducts zero-yield nuclear laboratory experiments.<sup>120</sup>

**Grade:** Modernizing U.S. nuclear facilities is of critical importance because the NNSA’s warhead modernization plans depend on the ability to produce certain components like plutonium pits. The importance of a functioning nuclear weapons complex also has increased as the threat posed by adversaries has worsened. Given the change to a three-party nuclear peer dynamic and both Russia’s and China’s active nuclear production capabilities, the United States must maintain the ability to adapt its nuclear posture and hedge against an uncertain future.

The United States maintains some of the world’s most advanced nuclear facilities. Significant progress has been made over the past decade in getting funded plans in place to recapitalize plutonium pit production capacity and uranium component manufacturing in particular as well as construction projects for new facilities. Nevertheless, these programs face challenges and delays.

Some parts of the complex have not been modernized since the 1950s, and plans for long-term



infrastructure recapitalization remain essential, especially as the NNSA embarks on an aggressive warhead life-extension effort. The weak state of U.S. test readiness is also of great concern. In a dynamic threat environment combined with an aging nuclear arsenal, the lack of this capability becomes more worrisome even as the NNSA improves its stockpile stewardship capabilities. Efforts to restore critical functions of the complex like pit production face great technical challenges and need stable funding. The recent shift in deadline for plutonium pit production at the Savannah River Site from 2030 to “as close to 2030 as possible” is one example. After years of deferred modernization, any unexpected failure or disruption at a critical facility could significantly affect schedules for nuclear warhead modernization.<sup>121</sup>

Until demonstrable progress has been made toward completion of infrastructure modernization, the grade for this category will therefore remain at “marginal.”

### **Personnel Challenges Within the National Nuclear Laboratories Score: Marginal**

U.S. nuclear weapons scientists and engineers are critical to the health of the complex and the stockpile. According to the FY 2023 SSMP, the National Nuclear Security Administration’s “greatest asset” is its “highly qualified and skilled world-class scientific and engineering workforce, without which DOE/NNSA could not meet its vital national security missions.”<sup>122</sup>

The ability to maintain and attract a high-quality workforce is critical to ensuring the future of the American nuclear deterrent, especially when a strong employment atmosphere adds to the challenge of hiring the best and brightest. Today’s weapons designers and engineers are first-rate, but they also are aging and retiring, and their knowledge must be passed on to the next generation of experts. This is a challenge because “[r]oughly a quarter of the current enterprise workforce is eligible to retire, and there will likely remain a significant retirement-eligible population for the near future.”<sup>123</sup>

The NNSA also needs to retain talent among “early-career employees (age 35 and under)” and those with five or fewer years of experience.<sup>124</sup> Young designers need meaningful and challenging warhead design and development tasks to hone their skills and remain engaged. The NNSA and its

weapons labs understand this problem and, with the support of Congress, are beginning to take the necessary steps to invest in the next generation.

The judgment of experienced nuclear scientists and engineers is critical to assessing the safety, security, effectiveness, and reliability of the U.S. nuclear deterrent. Without their experience, the nuclear weapons complex could not function. Few of today’s remaining scientists or engineers at the NNSA weapons labs have had the experience of taking a warhead from initial concept to “clean sheet” design, engineering development, production, and fielding. The SRP is remedying some of these shortfalls by having its workforce exercise many of the nuclear weapon design and engineering skills that are needed. To continue this progress, SRP funding should be maintained if not increased.

According to the SSMP, “[n]early half of the total [NNSA] workforce have 5 years of service or fewer.”<sup>125</sup> Given the length of time required to train new hires, the long timelines of warhead production cycles, and the time it takes to transfer technical knowledge and skills, both recruiting and retaining needed talent remain challenging for the NNSA.<sup>126</sup>

**Grade:** In addition to employing world-class experts, the NNSA labs have had good success in attracting and retaining talent (for example, through improved college graduate recruitment efforts and NNSA Academic Programs).<sup>127</sup> As many scientists and engineers with practical nuclear weapon design and testing experience retire, continued annual assessments and certifications of nuclear warheads will rely increasingly on the judgments of people who have never participated in yield-producing experiments on their weapon designs. Moreover:

As NNSA mission scope increases, so does the demand for increased personnel to support new facilities and capabilities being brought on-line, and to support moving to 24/7 operations at many sites across the complex. These individuals are essential to minimizing unplanned outages and to supporting safe and secure operations, particularly in high hazard operations.<sup>128</sup>

Hazardous NNSA infrastructure and facilities can also be a hindrance to recruitment and retention, so modernizing the nuclear weapons complex

will be essential.<sup>129</sup> Admiral Richard has emphasized the importance of investing in the workforce now: “If we lose those talent bases, you can’t buy it back. It will take 5 to 10 years to either retrain and redevelop the people or rebuild the infrastructure.”<sup>130</sup>

In light of these issues, the NNSA workforce earns a score of “marginal.”

### **Allied Assurance Score: Strong but Trending Toward Marginal**

The credibility of U.S. nuclear deterrence is one of the most important components of allied assurance. The United States extends nuclear assurances to more than 30 allies that have forgone nuclear weapon programs of their own. If allies were to resort to building their own nuclear weapons because their confidence in U.S. extended deterrence had been degraded, the consequences for nonproliferation and stability could become dire.

Unfortunately, there are indications that such weakening is already taking place.<sup>131</sup> According to a recent poll, for example, “more than 70% of South Koreans would support developing their own nuclear weapons or the return of nuclear weapons to their country.”<sup>132</sup> Japan is openly discussing the possibility of eventually developing its own nuclear weapons, a topic considered taboo in the relatively recent past.<sup>133</sup>

In Europe, France and the United Kingdom deploy their own nuclear weapons independently of the United States. The United States also deploys B-61 nuclear gravity bombs in Europe as a visible manifestation of its commitment to its NATO allies and retains dual-capable aircraft that can deliver those gravity bombs. The United States provides nuclear assurances to Japan, South Korea, and Australia, all of which face increasingly aggressive nuclear-armed regional adversaries.

Continued U.S. nuclear deterrence assurances must be perceived as credible by adversaries and allies alike. Both Japan and South Korea have the capability and basic know-how to build their own nuclear weapons quickly, and Australia has had nuclear ambitions in the past. A decision by allies to build their own nuclear weapons would be a major setback for U.S. nonproliferation policies and could increase regional instability.

**Grade:** Not unlike deterrence, assurance and extended deterrence are about allies’ and adversaries’ perceptions of the U.S. nuclear umbrella’s

credibility rather than what the United States thinks is a credible extended deterrent.

A worsening security environment appears to be causing U.S. allies to be more cautious when it comes to relying solely on U.S. extended deterrence commitments, and public debates about developing their own nuclear weapons appear to be more common than in the past. China continues to advance its capability to hold the U.S. homeland at risk with its strategic forces and to execute nuclear operations in the region. China has hundreds of nuclear-capable missiles in the region, and the United States deploys none. Both South Korean and Japanese leaders have recently discussed with President Biden the need to ensure that extended deterrence remains strong in light of these threats.<sup>134</sup>

European members of NATO continue to express their commitment to and appreciation of NATO as a U.S.-led nuclear alliance even as they worry about the impact of Russia’s growing non-strategic nuclear capabilities and nuclear saber-rattling over Western military support to Ukraine.<sup>135</sup> According to the 2022 NPR, allied assurance remains one of the primary goals of U.S. nuclear forces,<sup>136</sup> but while official statements remain positive, unofficial sentiment could indicate concern about U.S. extended deterrence commitments.

The 2018 NPR had proposed and allies had expressed support for two supplements to existing capabilities—a low-yield SLBM warhead and a new nuclear sea-launched cruise missile—as important initiatives to strengthen allied assurance.<sup>137</sup> The low-yield SLBM warhead, deployed in 2020, is an important component of America’s ability to deter regional aggression against its Asian and NATO allies and remains deployed under the current Administration. However, the Biden Administration has proposed canceling the SLCM-N, a capability that could be deployed directly to regional theaters of conflict to help assure our allies.<sup>138</sup>

The score for allied assurance remains “strong” but is trending toward “marginal” as the United States continues to implement a “business-as-usual” approach in the face of significant negative regional developments. The United States will need to make concerted efforts to strengthen its commitments to extended deterrence to reflect the change in threat, both through its capabilities and by communicating resolve, if this score is to remain unchanged in future editions of this *Index*.

## Overall U.S. Nuclear Weapons Capability Score: Marginal

The scoring for U.S. nuclear weapons must be considered in the context of a threat environment that is significantly more dangerous than it was in previous years. Until recently, U.S. nuclear forces needed to address one nuclear peer rather than two. Given a U.S. failure to adapt rapidly enough to these developments and the Biden Administration’s decision to cancel or delay various programs that affect the nuclear portfolio, this year’s *Index* changes the grade for overall U.S. nuclear weapons capability to “marginal.”

U.S. nuclear forces face many risks that without the continued bipartisan commitment to a strong deterrent could warrant an eventual decline to an overall score of “weak” or “very weak.” The reliability of current U.S. delivery systems and warheads is at risk as they continue to age and threats continue to advance. The fragility of “just in time” replacement programs only exacerbates this risk. In fact,

nearly all components of the nuclear enterprise are at a tipping point with respect to replacement or modernization and have no margin left for delays in schedule; delays that are appearing to occur despite the best efforts of the enterprise. Since every other military operation—and therefore overall national defense—relies on a strong nuclear deterrent, the United States cannot afford to fall short in fulfilling this imperative mission.

Future assessments will need to consider plans to adjust America’s nuclear forces to account for the doubling of peer nuclear threats. It is clear that the change in threat warrants a reexamination of U.S. force posture and the adequacy of our current modernization plans.

Therefore, the score for this portfolio was changed from “strong” to “marginal.” Failure to keep modernization programs on track while planning for a three-party nuclear peer dynamic could lead to a further decline in the strength of U.S. nuclear deterrence in future years.

## U.S. Military Power: Nuclear

|                                | VERY WEAK | WEAK | MARGINAL | STRONG | VERY STRONG |
|--------------------------------|-----------|------|----------|--------|-------------|
| Nuclear Stockpile              |           |      |          | ✓      |             |
| Delivery Platform Reliability  |           |      | ✓        |        |             |
| Warhead Modernization          |           |      | ✓        |        |             |
| Delivery Systems Modernization |           |      |          | ✓      |             |
| Nuclear Weapons Complex        |           |      | ✓        |        |             |
| National Labs Talent           |           |      | ✓        |        |             |
| Allied Assurance               |           |      |          | ✓      |             |
| <b>OVERALL</b>                 |           |      | ✓        |        |             |

## Endnotes

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55. During the early stages of the Cold War, the use of atomic and then nuclear weapons was considered to be a practical aspect of war. Military planners assumed that nuclear war was a real possibility and therefore developed military formations and employment concepts to conduct such a war and spent much effort to determine which targets would require nuclear weapons for their destruction. Beyond the initial strike envisioned in a nuclear conflict, planners also believed that a "second strike" capability was necessary to convince the Soviet leadership that even if the USSR had the ability to employ its own nuclear arsenal, the U.S. would have the ability to launch a second strike against whatever targets remained. This targeting analysis led to a discrete number of weapons and related delivery vehicles thought necessary to "win" a nuclear war in the hope that having enough power to win would have the favorable effect of deterring such a war in the first place. Over time, the primary focus within the nuclear war theorist community shifted from the use of such weapons in war to their value in deterring war, which is still the primary focus today.
56. For example, then-STRATCOM Commander General C. Robert Kehler testified in 2011 that "[a]t this time, China doesn't appear to seek to expand their nuclear arsenal beyond what they perceive as a credible deterrent and is unlikely to attempt to match numbers of nuclear weapons or warheads with either the U.S. or Russia." See General C. Robert Kehler, USAF, Commander, United States Strategic Command, response to question submitted post-hearing by Chairman Michael Turner in hearing, *The Status of United States Strategic Forces*, Subcommittee on Strategic Forces, Committee on Armed Services, U.S. House of Representatives, 112th Cong., 1st Sess., March 2, 2011, p. 121, <https://www.govinfo.gov>.

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# Missile Defense

Michaela Dodge, PhD

Missile defense is a critical part of the national security architecture that enables U.S. military efforts, deters attacks, and protects such critical infrastructure as population, industrial centers, and politically and historically important sites. It can strengthen U.S. diplomatic and deterrence efforts and give senior decision-makers the time and options they need to respond effectively during crises involving missiles that fly on ballistic and non-ballistic trajectories.

## The Growing Missile Threat

Missiles remain a weapon of choice for adversaries who view them as cost-effective coercive tools and symbols of power.<sup>1</sup> Both the number of states that possess missiles and the sophistication of those missiles will continue to increase as modern technologies become cheaper and more widely available. North Korea, Iran, China, and Russia all possess missile arsenals that threaten U.S. interests, forces deployed abroad, and allies and partners.

As one example of the growing threat, General Glen VanHerck, Commander, U.S. Northern Command and North American Aerospace Defense Command, testified in March 2023 that North Korea had “tested at least 65 conventional theater and long-range nuclear capabilities over the last year.”<sup>2</sup> These tests enable Pyongyang to improve and adapt its missile program, adding to an already formidable threat. North Korea has stated that it tested its “most powerful” missile to date in April 2023,<sup>3</sup> and two short-range missiles that it test fired appear to have landed within Japan’s exclusive economic maritime zone.<sup>4</sup> Pyongyang will likely continue its aggressive development and testing as it seeks to make its missile forces more survivable before and after launch.<sup>5</sup>

In similar fashion, Iran continues to modernize and proliferate its regional missile systems. It says it recently successfully tested a missile with a range of 2,000 kilometers.<sup>6</sup> It also displayed its first hypersonic missile and has provided Russia with hundreds of loitering munitions for Russia’s war in Ukraine.<sup>7</sup> Tehran’s continued pursuit of “space launch vehicles (SLVs)—including its Simorgh—shortens the timeline to an ICBM if it decided to develop one because SLVs and ICBMs use similar technologies.”<sup>8</sup>

According to Assistant Secretary of Defense for Space Policy John Plumb, China “has accelerated its efforts to develop, test, and field advanced missile systems of all classes and ranges, including ballistic, cruise, and hypersonic glide vehicles.”<sup>9</sup> The U.S. Department of Defense (DOD) has noted that in 2021, China “launched approximately 135 ballistic missiles for testing and training, more than the rest of the world combined excluding ballistic missile employment in conflict zones.”<sup>10</sup> China also launched 11 missiles into waters near Taiwan in August 2022.<sup>11</sup> Beijing is rapidly building hundreds of new missiles, including modern ICBMs that can carry multiple warheads and theater-range missiles that can strike U.S. assets, and “[t]he number of warheads on the PRC’s land-based ICBMs capable of threatening the United States is expected to grow to roughly 200 in the next five years.”<sup>12</sup> In 2021, China tested a fractional orbital bombardment system (FOBS) that deployed a hypersonic glide.<sup>13</sup>

Russia has launched thousands of air and missile platforms against Ukraine to “terrorize the Ukrainian people while degrading Ukraine’s warfighting capability.”<sup>14</sup> According to General VanHerck, Russia’s invasion of Ukraine in 2022 “proved that [it] has the capability and capacity to inflict

significant damage to infrastructure and other critical targets with its all-domain long-range strike capabilities.” Capabilities that Russia “has showcased in Ukraine” include “air- and sea-launched cruise missiles capable of striking North America, cyber activities, and economic coercion.” Russia also has “continued to conduct major military exercises and test developmental capabilities that will compound the threat to North America once fielded” and “is testing its special mission Belgorod nuclear submarine, a modern platform capable of carrying the nuclear-capable Poseidon torpedo, designed to hold the homeland at risk by striking coastal targets from thousands of miles away.”<sup>15</sup>

### **The Strategic Role of Missile Defense**

Missile defense plays a critical role both in deterring an attack and in mitigating the damage to U.S. forces, infrastructure, and population centers in the event deterrence fails. The ability to deter an attack depends on the ability to convince an adversary that the attack will fail, that the cost of carrying out a successful attack is prohibitively high, or that the consequences will outweigh the perceived benefit.

A U.S. missile defense system strengthens deterrence by offering a degree of protection to U.S. populations, military forces, and allies that makes it harder for an adversary to threaten them with missiles.<sup>16</sup> By raising the threshold for missile attack, missile defense can complicate an adversary’s planning, remove the option for a “cheap shot” against the United States and its allies, and perhaps make an adversary think twice before launching an attack, especially a larger-scale attack that would certainly prompt a robust U.S. response. By protecting key U.S. assets, missile defense also mitigates an adversary’s ability to intimidate or coerce the United States into making concessions.

Missile defense systems help to enable U.S. and allied conventional operations. During a regional conflict, adversaries could deny the United States the ability to conduct offensive operations by targeting U.S. and allied forward-deployed personnel or military assets. In addition, they might try to decouple the United States from defense of its allies by threatening to strike U.S. forces or the U.S. homeland if the United States intervenes on behalf of others in a regional conflict. Missile defenses can therefore strengthen the credibility of U.S. extended

deterrence by making it easier for the U.S. military to introduce reinforcements that can move more freely through a region.

A missile defense system gives decision-makers more time to choose the best course of action. Without the ability to defend against an impending attack, U.S. authorities would be limited to an unappealing set of responses that could range from preemptive attacks to acceding to an enemy’s demands or actions. By providing some level of protection, robust missile defense systems could affect the dynamics of decision-making by removing the need to take immediate action—an especially critical consideration in the event of an unauthorized or accidental missile launch by an adversary. Missile defense can therefore be profoundly stabilizing.

Finally, in both nuclear and conventional missile attack scenarios, missile defense minimizes damage if deterrence fails. A strong missile defense system would not only help to protect countless American lives; it would also help to keep U.S. forces available during a fight. During a campaign against China in the Indo-Pacific, for example, missile defenses deployed in the region could lower the loss rate for U.S. forces compared to the rate of replacement, thereby extending the war effort and giving U.S. forces more time to prevail.<sup>17</sup>






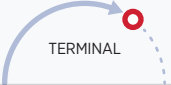





Since the end of the Cold War, Congress has supported the development of a regional missile defense system, but it has not supported the development of a comprehensive layered system to protect the homeland. The reason: a lingering Cold War-era view that U.S. missile defenses would be “destabilizing” vis-à-vis the Soviet Union. Skeptics argued that the Soviets would be incentivized to strike first before defenses could be deployed or more likely to strike first in a crisis for fear that a U.S. missile defense system would undermine their retaliatory capability after a U.S. first strike. The notion of long-range missile defenses as destabilizing was codified in the 1972 Anti-Ballistic Missile (ABM) Treaty, from which the United States withdrew in 2002 citing the need to develop such defenses against North Korea’s and Iran’s evolving missile capabilities.

### **The U.S. Missile Defense System**

The U.S. missile defense system has three critical physical components:

FIGURE 7

## U.S. Missile Defense: Interceptors

|  |  |   |   | MISSILE THREAT TYPE                   |
|--|--|---|---|---------------------------------------|
|   |  |   |   | <b>Intercontinental</b><br>5,500 km   |
|  |   |   |   | <b>Intermediate-Range</b><br>3,000 km |
|  |   |    |   | <b>Medium-Range</b><br>1,000 km       |
|  |   |    |   | <b>Short-Range</b>                    |
| <br><b>Ground-based Interceptor</b><br>44 interceptors | <br><b>Aegis Standard Missile-3</b><br>47 Aegis BMD-equipped ships | <br><b>Terminal High Altitude Area Defense</b><br>7 batteries | <br><b>Patriot Advanced Capability-3</b><br>15 battalions |                                       |

**SOURCES:** Center for Strategic and International Studies, Missile Defense Project, “Aegis Ballistic Missile Defense,” *Missile Threat*, last updated August 4, 2021, <https://missilethreat.csis.org/system/aegis/> (accessed September 14, 2023), and U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, *United States Department of Defense Fiscal Year 2023 Budget Request, Program Acquisition Cost by Weapon System*, April 2022, pp. 4–5, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023\\_Weapons.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023_Weapons.pdf) (accessed September 14, 2023).

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- Sensors,
- Interceptors, and
- Command and control infrastructure that provides data from sensors to interceptors.

Of these, interceptors receive much of the public’s attention because of their visible and kinetic nature. Components of missile defense systems can be

classified based on the phase of flight during which intercept occurs, although some—for example, the command and control infrastructure or radars—can support intercepts in various phases of flight. Interceptors can shoot down an adversary ballistic missile in the boost, ascent, midcourse, or terminal phase of its flight. As cruise missiles and hypersonic glide vehicles continue to proliferate, the Missile Defense Agency (MDA) and the military services must therefore consider intercepts in all four phases of flight.

Another way to classify missile defense systems is by the range of an incoming missile (short-range, medium-range, intermediate-range, or intercontinental-range). An interceptor's flight time determines both the time available to conduct an intercept and the optimal interceptor placement to improve intercept probability. With an intercontinental ballistic missile (ICBM), the United States has "30 minutes or less"<sup>18</sup> to detect the missile, track it, provide the information to the missile defense system, find the optimal firing solution, launch an interceptor, and shoot down the incoming missile, ideally with enough time to fire another interceptor if the first attempt fails—a tactic known as "shoot-look-shoot." The time needed to intercept short-range, medium-range, and intermediate-range ballistic missiles is shorter.

Finally, missile defense can be framed by the origin of interceptor launch. At present, U.S. interceptors are launched from the ground or from the sea. In the past, the United States explored possible ways to intercept ballistic missiles from the air or in space,<sup>19</sup> but such efforts have been limited since the U.S. withdrawal from the ABM Treaty in 2002.

The current U.S. missile defense system is a result of investments made by successive U.S. Administrations with the support of Congress. President Ronald Reagan envisioned a defensive shield—the Strategic Defense Initiative (SDI)—as a layered ballistic missile defense (BMD) system that ultimately would render nuclear missiles "impotent and obsolete."<sup>20</sup> These layers would have boost, ascent, midcourse, and terminal interceptors, including directed-energy interceptors, providing the United States with more than one opportunity to shoot down an incoming missile.

The United States stopped far short of this goal even though the SDI program generated tremendous technological advances and benefits.<sup>21</sup> Instead of a comprehensive layered system, the United States has no boost-phase BMD systems and extremely limited midcourse defense against the advanced ballistic missile threats from China and Russia. The volatility and inconsistency of priority and funding for missile defense by successive Administrations and Congresses—controlled by *both* major political parties—have yielded a system that is limited both numerically and technologically and is extremely limited in defending against

more sophisticated or more numerous long-range missile attacks.

The National Missile Defense Act of 1999 made it U.S. policy to protect the homeland only from a "limited ballistic missile attack."<sup>22</sup> The National Defense Authorization Act (NDAA) for Fiscal Year 2017 dropped the word "limited" even as it continued to focus on ballistic missiles.<sup>23</sup> Then the 2020 NDAA made it a matter of policy to rely on nuclear deterrence to defend against "near-peer intercontinental missile threats" and focus on improving missile defense against "rogue states."<sup>24</sup> In the future, as technological trends progress and modern technologies become cheaper and more widely available, North Korean or Iranian ballistic missiles and countermeasures may rival—in sophistication if not in numbers—those of Russia or China. Consequently, the United States must remain aware of how such threats are evolving and be prepared to alter its missile defense posture accordingly.

In January 2019, the Trump Administration published its congressionally mandated Missile Defense Review (MDR), a statement of policy intended to guide the Administration's missile defense programs. The 2019 MDR addressed the dangerous threat environment that had evolved since the previous MDR in 2010 and recognized that future missile defense systems will have to defend against cruise and hypersonic missiles in addition to ballistic missiles.<sup>25</sup>

The Biden Administration's 2022 Missile Defense Review recognizes that the "evolution of offensive air and missile threats has accelerated greatly since the United States began developing its first ballistic missile defense systems over fifty years ago" and that "[t]his trend represents a growing national security challenge expected to multiply in scope and complexity over the coming decade."<sup>26</sup> However, it does not include any major new initiatives or any reference to the Trump Administration's nascent proposal for building a "layered" missile defense for the U.S. homeland.

For fiscal year (FY) 2024, the Biden Administration has requested \$10.9 billion for the MDA,<sup>27</sup> \$1 billion more than the \$9.6 billion it requested in FY 2023.<sup>28</sup>

## Interceptors

Interceptors are one major component of the U.S. missile defense system. Different types of



interceptors that respond to different missile threats have been emphasized over the years, and the composition of today's U.S. missile defense reflects these choices.

While the United States is working to improve its ability to strike down cruise missiles and hypersonic glide vehicles, its fully operational missile defense systems are best suited to the interception of ballistic missiles. Missile defense interceptors can potentially intercept ballistic missiles in three different phases of flight.

- **The boost phase** extends from the time a missile is launched from its platform until its engines stop thrusting.
- **The midcourse phase** is the longest and thus offers an optimal opportunity to intercept an incoming threat and, depending on other circumstances like the trajectory of the incoming threat and quality of U.S. tracking data, enables more shots if the first intercept attempt fails.
- **The terminal phase**, typically less than one minute long, occurs as the missile plummets through the atmosphere toward the target and offers a very limited opportunity to intercept a ballistic missile threat.

**Boost-Phase Interceptors.** The United States currently has no capability to shoot down missiles in their boost phase. Technologically, boost-phase intercept is the most challenging option because of the very short time during which a missile is boosting, the missile's extraordinary rate of acceleration during this brief window of time, and the need to have the interceptor close to the launch site.<sup>29</sup> This is also, however, the most beneficial time to strike. A boosting ballistic missile is at its slowest speed compared to other phases; it is therefore not yet able to maneuver evasively and has not yet deployed countermeasures or multiple warheads that complicate the targeting and intercept problem.

In the past, the United States pursued several boost-phase programs, including the Airborne Laser, the Network Centric Air Defense Element, the Kinetic Energy Interceptor, and the Air Launched Hit-to-Kill missile. Eventually, each of these programs was cancelled because of technical,

operational, or cost challenges, and other boost-phase programs have not progressed significantly.

**Midcourse-Phase Interceptors.** Intercepting missiles in their midcourse phase offers more time for intercept attempts and presents relatively fewer technological challenges than intercepts in the boost phase present, but it also allows the missile time to deploy decoys and countermeasures that can complicate interception by overwhelming sensors and radars. The United States deploys two systems that can shoot down incoming missiles in the midcourse phase of flight:

- The Ground-Based Midcourse Defense (GMD) system and
- The Aegis defense system.

The GMD system is the only operational system that is designed to shoot down a long-range ballistic missile headed for the U.S. homeland. It consists of 40 Ground-Based Interceptors (GBIs) at Fort Greeley, Alaska, and four at Vandenberg Air Force Base, California. A GBI consists of a multi-staged rocket booster and an Exoatmospheric Kill Vehicle (EKV) that intercepts the incoming missile with hit-to-kill technology. In FY 2023, the MDA "increased US Northern Command Ground Based Interceptor capacity in the most advanced configuration with Capability Enhanced-II Block 1 Exo-atmospheric Kill Vehicles integrated on new Configuration 2 boost vehicles."<sup>30</sup>

To increase the probability of an intercept, the United States can launch multiple interceptors at each incoming ballistic missile. At present, because the inventory of interceptors is limited, the United States can intercept only a handful of ballistic missiles that have relatively unsophisticated countermeasures.

In 2017, Congress approved a White House request to increase the number of GBIs from 44 to 64 to keep up with the advancing ballistic missile threat, particularly from North Korea.<sup>31</sup> The MDA intended to produce a Redesigned Kill Vehicle (RKV) to top 20 additional GBIs that would fill the new silos, but this program was canceled in 2019 because of technological difficulties.<sup>32</sup> The MDA instead initiated the Next Generation Interceptor (NGI) program to build an entirely new interceptor that would add both capacity and capability to the

GMD system. The MDA plans to field NGIs “no later than the end of 2028,”<sup>33</sup> and they could eventually replace some or all of the existing 44 GBIs. Unlike the GBIs, the NGIs will feature multiple kill vehicles, giving a single NGI multiple opportunities to intercept an incoming threat.<sup>34</sup>

Contracts to develop the NGI were awarded to Lockheed Martin and a Northrop Grumman–Raytheon team in March 2021.<sup>35</sup> The FY 2024 presidential budget request includes \$2.1 billion for NGI to support these two competing contracts.<sup>36</sup>

The Aegis defense system is a sea-based component of the U.S. missile defense system. It is designed to address the threat of short-range, medium-range (1,000–3,000 kilometers), and intermediate-range (3,000–5,500 kilometers) ballistic missiles. It utilizes different versions of the Standard Missile-3 (SM-3) and SM-6 depending on the threat and other considerations like ship location and quality of tracking data. The Aegis system also has capability against aerial threats (aircraft and unmanned aerial systems) and cruise missiles.<sup>37</sup> According to the FY 2024 MDA budget submission, “[b]y the end of FY 2024, there will be 53 total BMD capable ships requiring maintenance support.”<sup>38</sup> Japan has several Aegis BMD-capable destroyers and cooperated with the United States to develop the latest SM-3 missile, the SM-3 Block IIA.<sup>39</sup>

The United States also deploys a land-based version of Aegis, the Aegis Ashore system, in Romania and another in Poland. The site in Poland experienced repeated delays in achieving initial operational capability but “is expected to be delivered” in FY 2023.<sup>40</sup> Aegis Ashore sites relieve some of the requirements on the naval fleet because BMD-capable cruisers and destroyers are multi-mission and are used for other purposes, such as wartime fleet operations and even anti-piracy operations. These Aegis Ashore sites help to protect U.S. allies and forces in Europe from the Iranian ballistic missile threat.

Aegis BMD will also play a significant role in the development of a missile defense system on the U.S. territory of Guam, one of the MDA’s priorities in the FY 2024 budget request. Former Commander of U.S. Indo-Pacific Command (INDOPACOM) Admiral Philip Davidson has testified that “the most important action we can take to increase the joint force’s lethality [in the region] is to introduce a **360-degree, persistent, air and missile defense**

**capability on Guam (Guam Defense System (GDS)).**”<sup>41</sup> Current INDOPACOM Commander Admiral John Aquilino testified in March 2022 that “Guam’s strategic importance is difficult to overstate” and emphasized “the importance of the island for sustaining the joint force as our main operating base and home to 130,000 Americans.”<sup>42</sup>

The FY 2024 budget request includes a total of \$1.5 billion to continue development of an architecture for Guam defense and to begin procurement of needed components, including SM-3, SM-6, and Aegis fire control components.<sup>43</sup>

In November 2020, the U.S. Navy and the MDA shot down an ICBM-type target using the SM-3 Block IIA.<sup>44</sup> The test, FTM-44, was the first step in a plan to use SM-3 Block IIAs as an “underlay” to the GMD system to defend the homeland with GBIs taking the first shots at an incoming target and SM-3 interceptors taking shots if the GBIs miss.<sup>45</sup> The MDA had planned to test the SM-3 IIA against a more sophisticated ICBM countermeasure set as the next step, but the budget request for FY 2023 eliminated funds to pursue the SM-3 IIA as a homeland underlay.<sup>46</sup> According to the Government Accountability Office, the MDA “did not complete its fiscal year 2022 flight, ground, and cyber baseline test program” and did not meet its annual goals for fielding the systems, leaving the warfighter with “less fielded capability than planned.”<sup>47</sup>

**Terminal-Phase Interceptors.** The United States currently deploys three terminal-phase missile defense systems:

- Terminal High Altitude Area Defense (THAAD);
- The Patriot missile defense system; and
- Aegis BMD.

A THAAD battery can “intercept and destroy ballistic missiles inside or outside the atmosphere during their final, or terminal, phase of flight”<sup>48</sup> and consists of a launcher, interceptors, the Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY-2) radar, and fire control.<sup>49</sup> The system is transportable and rapidly deployable. THAAD batteries have been deployed to such countries as Japan, South Korea, Israel, and the United Arab Emirates (UAE), and the U.S. signed a deal in

2020 to deliver THAAD to Saudi Arabia.<sup>50</sup> In February 2022, THAAD was “employed successfully by the UAE in the first two combat employments of that system.”<sup>51</sup>

Patriot is an air-defense and short-range ballistic missile defense system. A battery includes a launcher, interceptors, AN/MPQ-53/65 radar, an engagement control station, and diesel-powered generator units. The Patriot family of missile defense interceptors has been upgraded over time from the initial Patriot Advanced Capability-1 (PAC-1) deployed in Europe in 1988 to the PAC-3 configuration deployed around the world today. The most recent Patriot upgrade, the PAC-3 Missile Segment Enhancement, “expands the lethal battlespace with a two-pulse solid rocket motor.”<sup>52</sup> The system is transportable and “is currently deployed in multiple theaters around the world with daily operational activities.”<sup>53</sup> Particularly notable is the system’s combat performance in Ukraine, where it has intercepted Russian Kinzhal hypersonic missiles among others.<sup>54</sup>

To increase the defended battlespace, the MDA is pursuing the Patriot Launch-on-Remote (THAAD) capability, which integrates the PAC-3 and THAAD systems by enabling a PAC-3 interceptor to utilize targeting data from a THAAD AN/TPY-2 radar. Launch-on-Remote is a significant capability that can increase the defended area by spreading out missiles.<sup>55</sup> After two failed tests in 2020, the MDA, in conjunction with the Army, conducted two successful tests early in 2022.<sup>56</sup> The MDA, in coordination with the Army, “will begin global fielding this fiscal year.”<sup>57</sup>

Progress on building a Guam defense system has moved slowly despite the urgency of the Chinese threat.<sup>58</sup> Even though this missile defense system first appeared on the INDOPACOM Unfunded Priorities List in 2019, the President requested and Congress first provided funding for the system only in FY 2022.<sup>59</sup> The \$192 million that was appropriated fell far short of the \$350 million requested by INDOPACOM for that year,<sup>60</sup> but the FY 2024 budget request includes \$1.5 billion to strengthen the island’s missile defense.<sup>61</sup>

General VanHerck recently testified that he remains “confident in our current capability to defend the homeland against a limited DPRK [Democratic People’s Republic of Korea] ballistic missile threat” but is “concerned about future

capacity and capability to respond to advancing DPRK ballistic missile threats, making it crucial to field the Next Generation Interceptor (NGI) as funded in the FY23 Consolidated Appropriations Act (P.L. 117-328).”<sup>62</sup>

The first NGI flight tests are scheduled for “the 2027 timeframe.”<sup>63</sup> NGI will add needed capacity and capability to the GMD system, which some see as in danger of being overwhelmed by the increasing capacity of North Korea’s ballistic missiles to strike the U.S. homeland and by North Korea’s ability to deploy countermeasures.<sup>64</sup>

The MDA and Congress also continue to support a GMD service life extension program (SLEP) that is intended to maintain the existing fleet through this decade and beyond 2030. Given that NGI will not replace the existing GBI fleet—at least not initially—it is critical that the existing interceptors remain in service. The GMD system was largely built in the early 2000s, and many parts—including the GBI kill vehicles, boosters, and ground systems—are subject to degradation from aging. The MDA will need to consider additional NGI purchases after the initial 20 to begin replacing existing GBIs in the 2030s.

In 2019, to strengthen homeland missile defense after the RKV was canceled and before NGI comes online, the Trump Administration proposed the development of an underlayer using SM-3 Block IIA and THAAD interceptors. General VanHerck agreed that “an underlayer would give us additional capacity and capability” to address threats to the homeland.<sup>65</sup> The MDA had progressed toward this underlayer after its successful test of the SM-3 IIA against an ICBM-type target in 2020, but the DOD had not articulated a concept of operations for employing the SM-3 Block IIA and THAAD for homeland defense, including where in the United States those systems could be deployed or how many would be required, as requested by Congress. In addition, no funding for the layered homeland defense program was included in the budget request for FY 2023, and none is included in the budget request for FY 2024.

However, even though the MDA is investing in the GMD SLEP and the NGI program to ensure defense of the homeland, forgoing a homeland underlayer will deprive the homeland of added capacity against worsening missile threats. The utility of exploring the use of SM-3 and THAAD interceptors to shoot down ICBMs can also extend beyond an

underlay for the continental United States, as they can work for other missions or defend assets like Hawaii, Alaska, and Guam.

Currently, the only interceptor the United States has available to intercept hypersonic missiles is the SM-6.<sup>66</sup> To strengthen U.S. capability against maneuverable hypersonic missiles, the MDA is in the early stages of developing the Glide Phase Interceptor (GPI), which is designed to intercept regional hypersonic missiles in their glide phase of flight, and plans to conduct a simulated engagement against a hypersonic glide vehicle in FY 2024.<sup>67</sup> The FY 2024 budget request includes \$209 million for hypersonic defense.<sup>68</sup>

The Army's Indirect Fire Protection Capability Increment 2 (IFPC 2) program has been moving very slowly, and a key assessment of the system has recently been delayed by a year.<sup>69</sup> The IFPC 2 would defend against short-range rockets, artillery, and mortars as well as cruise missiles, against which the United States, as noted, lacks a sufficient defensive capability.<sup>70</sup> As a system, IFPC would fill the gap between short-range tactical air defense and ballistic missile defense like PAC-3 and THAAD.

In response to a congressional requirement that it field an interim cruise missile defense capability in response to the increasing cruise missile threat, the Army purchased two Iron Dome batteries manufactured by the Israeli company Rafael.<sup>71</sup> Despite prior concerns about integrating Iron Dome as part of an enduring IFPC solution, the Army is preparing the Iron Dome systems for operational deployment and integration into its future missile defense command and control system.<sup>72</sup> In 2021, the Army deployed Iron Dome to Guam and conducted a successful simulation to test the system,<sup>73</sup> but there is as yet no evidence to indicate that Iron Dome will be integrated into the Guam defense system that is under development.

In September 2021, the Army awarded a contract to Dynetics to develop its own enduring IFPC 2 system.<sup>74</sup> The Army set the initial date of March 2024 to receive 16 launcher prototypes and 60 "fieldable" interceptors.<sup>75</sup>

Overall, the United States has multiple capable interceptors, but there is much room for improvement, including strengthening missile defense capabilities against more robust missile threats from Russia and China, both qualitatively and quantitatively. The most important step for the near future

will be on-time or early delivery of the NGI to ensure protection of the homeland from North Korea. The United States also ought to invest in research and development of space-based missile defense if it is ever to have a truly comprehensive protection from larger-scale missile attacks.

## Sensors

The sensor component of the U.S. missile defense system is distributed across the land, sea, and space domains and provides the United States and its allies with an early warning of a launch of enemy ballistic missiles in addition to missile tracking and discrimination.<sup>76</sup> These sensors can detect a ballistic missile launch, track a missile in flight, and even classify the type of projectile, its speed, and the target against which the missile has been directed. They relay this information to the command and control stations that operate interceptor systems like Aegis (primarily a sea-based system) or THAAD (a land-based system).

**Land-Based.** On land, the major sensor installations are the Upgraded Early Warning Radars (UEWRs), which are concentrated along the North Atlantic and Pacific corridors that present the most direct flight path for a missile aimed at the United States. They include the phased array UEWRs based in Alaska, California, Massachusetts, the United Kingdom, and Greenland that scan objects up to 3,000 miles away.<sup>77</sup> They support homeland missile defense by providing early warning and improving the quality of midcourse tracking data.<sup>78</sup>

The United States also deploys mobile AN/TPY-2 land-based sensors. Of the 12 AN/TPY-2 systems that have been produced so far, five "are operating in forward-based mode worldwide in support of the U.S. and its allies" and seven "are operating in terminal mode as part of THAAD weapon systems in support of Army and regional defense Missions."<sup>79</sup> According to Admiral Hill, "Radar 13, planned for delivery in March 2025, will be part of THAAD Battery 8 and be a fully modernized configuration that includes significant obsolescence redesigns leveraged from our ongoing Foreign Military Sales (FMS) cases."<sup>80</sup> In cooperation with the Republic of Korea, the United States deploys a THAAD missile system accompanied by an AN/TPY-2 on the Korean Peninsula.

To fill a gap in missile discrimination capability for tracking North Korean missiles over the Pacific,

the MDA is developing the Long Range Discrimination Radar (LRDR) in northern Alaska to improve coverage in the northern Pacific. The LRDR utilizes the SPY-7 radar, which the MDA will also purchase for the Guam defense system.<sup>81</sup> The DOD has also identified the need to develop the Homeland Defense Radar–Hawaii (HDR–H) to fill a tracking and discrimination gap over Hawaii. The FY 2024 budget request includes \$103.5 million for the radar, which will support the completion of acceptance testing and enable an operational flight test in FY 2023.<sup>82</sup>

**Sea-Based.** There are two types of sea-based sensors. The first is the Sea-Based X-band (SBX) radar, which is “mounted on a mobile, ocean-going, semi-submersible platform that provides the missile defense system with an extremely powerful and capable radar that can be positioned to cover any region of the globe.”<sup>83</sup> SBX is employed primarily in the Pacific. The second is the SPY-1 radar system, which is mounted on U.S. Navy vessels equipped with the Aegis Combat System and is therefore able to provide data that can be utilized for ballistic missile missions. The Navy is installing the radar on 29 new ships and replacing all SPY-1 radars with the SPY-6 radar, which will have a greater detection range and other advanced capabilities.<sup>84</sup>

**Space-Based.** Finally, U.S. missile defense sensors operate in space. From the ultimate high ground, space-based sensors have the potential to detect and track missile launches from almost any location from boost phase to terminal phase, unlike ground-based radars that are limited in their tracking range.<sup>85</sup> The MDA, the U.S. Space Force, and the Space Development Agency (SDA) all control aspects of the space missile defense sensor system.

The oldest system that contributes to the missile defense mission is the Defense Support Program (DSP), a constellation of satellites that use infrared sensors to identify heat from booster and missile plumes to detect an initial launch. In 2020, the Department of Defense awarded a \$222.5 million contract to keep the program going through 2030.<sup>86</sup> The DSP satellite system has gradually been replaced by the Space-Based Infrared Radar System (SBIRS) to improve the delivery of missile defense and battle-field intelligence.<sup>87</sup> Because SBIRS can scan a wide swath of territory while simultaneously tracking a specific target, for example, it is useful in observing tactical, or short-range, ballistic missiles.<sup>88</sup>

The Space Force launched the sixth and final SBIRS satellite in August 2022.<sup>89</sup> The Air Force originally planned to launch eight SBIRS satellites, but because of congressional funding delays, it decided to end production of SBIRS early and move on to development of its replacement, the Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) satellite, in 2017.<sup>90</sup> The sixth SBIRS satellite was formally transferred from Space Systems Command to Space Operations Command on March 24, 2023.<sup>91</sup> The first of the Next-Gen OPIR satellites, which are designed to be more survivable against cyber and electronic attacks, is scheduled to launch in 2025.<sup>92</sup>

The MDA also has developed and deployed Spacebased Kill Assessment (SKA) sensors on commercial satellites.<sup>93</sup> SKA uses a network of infrared sensors to provide a hit and kill assessment of homeland defense intercepts. After several years of successful testing of SKA sensors in orbit, the FY 2024 budget supports “on-orbit operations by experimenting and participating in missile defense system ground and flight tests and providing situational awareness hit assessment to USNORTHCOM during declared periods of heightened activity.”<sup>94</sup>

The United States is developing a system of satellites capable of providing global detection, tracking, and discrimination of any missile launch. Dating from as far back as President Reagan’s Strategic Defense Initiative, successive Administrations have called for a proliferated layer of sensing satellites in space to track the flight of any type of missile—not just ballistic—from birth to death. A layer of space-based sensors can be particularly useful in tracking hypersonic vehicles, which fly at lower altitudes than ballistic missiles and can maneuver during flight. The DSP and SBIRS systems were designed for ballistic missiles and can lose track of missiles flying at lower altitudes. Since many new threats are not flying on ballistic trajectories (hypervelocity vehicles, for example), Congress has been paying close attention to development of a space sensor layer that is capable of tracking the evolving threat.

Beginning in 2009, the MDA operated two Space Tracking and Surveillance System–Demonstrators (STSS–D) satellites in an effort to demonstrate this capability to track ballistic missiles that exit and reenter the Earth’s atmosphere during the mid-course phase. Data obtained by those demonstration satellites were used to provide risk reduction

to support future space trackers. According to the MDA, “Space Vehicle[s] Vehicle 1 and 2 were retired on orbit on February 9, 2022 and March 8, 2022 respectively.”<sup>95</sup>

Today, the SDA, in conjunction with the MDA, is developing a space Tracking Layer of satellites proliferated in Low-Earth Orbit (LEO) as part of the SDA’s Proliferated Warfighter Space Architecture, formerly known as the National Defense Space Architecture. According to the SDA:

Once fully operational, the SDA Tracking Layer will consist of a proliferated heterogeneous constellation of Wide Field of View (WFOV) space vehicles (SVs) that provide persistent global coverage and custody capability combined with the Missile Defense Agency (MDA) Hypersonic and Ballistic Tracking Space Sensor (HBTSS) Medium Field of View (MFOV) SVs that provide precision global access capability.<sup>96</sup>

Once deployed, the Tracking Layer will be able to detect, track, and discriminate among different types of missile launches throughout the entirety of the missiles’ flights, including both hypersonic glide vehicles and dimmer ballistic missile targets. The SDA is also exploring the ability of space sensors to provide fire control information directly to weapon platforms like THAAD or Aegis (as opposed to the data going through a ground station). The first 10 satellites were launched in April 2023.<sup>97</sup>

The MDA has requested \$109.5 million for Missile Defense Space Programs in FY 2024 with a large portion of the funding dedicated to the HBTSS.<sup>98</sup> In 2021, the MDA awarded contracts to Northrop Grumman and L3Harris to develop HBTSS prototypes, which are scheduled to launch in the fourth quarter of FY 2023.<sup>99</sup>

Senior defense leaders have stated repeatedly that deploying sensor satellites to space to track missiles from the high ground throughout their entire flight is the best way to advance sensor capability. For example, MDA Director Vice Admiral Jon Hill has stated that “[s]pace-based sensors are critical to integrated sensor-to-shooter capabilities used to defeat ballistic and hypersonic missile threats.”<sup>100</sup> According to Admiral Charles Richard, then-Commander of U.S. Strategic Command (STRATCOM):

Future space-based sensors may be able to provide birth-to-death detection, tracking, and discrimination of hypersonic glide vehicle, cruise missile, and ballistic missile threats globally. These abilities cannot be fully achieved with the current or future terrestrial-based radar architecture due to the constraints of geography and characteristics of future missile threats.<sup>101</sup>

The space-based sensor program has been plagued by insufficient funding requests and bureaucratic infighting over whether the SDA or the MDA would develop the HBTSS,<sup>102</sup> and despite some progress in resolving the conflict, congressional concern has reemerged.<sup>103</sup> A strong assessment of missile defense sensing capabilities depends on progress made on the space-based sensor effort, especially in view of warfighting commanders’ urgent need for improved missile tracking as well as the technological challenges associated with developing a sensor that can perform in LEO.<sup>104</sup>

Development of land-based sensors to fill the missile discrimination capability gap over the Pacific has progressed slowly. Development of the LRDR completed initial fielding, but the program incurred delays that were “caused by the COVID-19 pandemic and other factors.”<sup>105</sup>

Additionally, improved sensor capabilities are critical to addressing the cruise missile threat to the homeland. As noted previously, the United States has no dedicated missile defense system to counter this threat. Because of their low altitude in flight and uncertain trajectories, cruise missiles are more difficult to detect and track than ballistic missiles are. Russia’s ability to strike key strategic nodes in the U.S. homeland from its own territory is of particular concern. To address this threat, General VanHerck has emphasized improving domain awareness, because early identification of a threat allows for options like left-of-launch operations (destroying a missile before it is launched or preventing its launch by neutralizing launch enablers) or alerting forces to take precautionary actions.<sup>106</sup>

The Department of Defense is requesting \$428.7 million in the FY 2024 defense budget “for the continued fielding of four new over-the-horizon radars.”<sup>107</sup> These radars will provide long-range sensor coverage of likely air and cruise missile threats to North America, as well as a capability against

hypersonic threats, and maritime surface vessels. NORTHCOM's unfunded priorities list for FY 2024 includes \$212 million for nine long-range radars "to fill surveillance gaps caused by existing radar failures."<sup>108</sup> (This refers to Chinese balloon intrusions early in 2023 that initially went undetected.<sup>109</sup>) Additionally, developing a capability to detect, track, and eventually intercept a conventional cruise missile attack will be critical to denying adversaries the ability to hold the homeland at risk below the nuclear threshold.

The Space Force removed one of three planned geosynchronous orbit satellites, a part of the Next-Gen OPIR program, from its FY 2024 budget request.<sup>110</sup> The Army is also progressing on development of the Lower-Tier Air and Missile Defense System (LTAMDS) radars that will provide 360-degree threat coverage for PAC-3 and other regional missile defense batteries; the current Patriot radar can scan only one-third of the sky at a time.<sup>111</sup> The LTAMDS program has experienced "cascading delays," and the current plan is to move it to the major capability acquisition phase in FY 2024.<sup>112</sup>

## Command and Control

Command and control of the U.S. ballistic missile defense system requires bringing together data from sensors and radars and relaying those data to interceptors so that they can destroy incoming missiles directed against the U.S. and its allies. The operational hub of missile defense command and control is the Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), a component of STRATCOM housed at Schriever Air Force Base, Colorado. JFCC IMD brings together Army, Navy, Marine Corps, Space, and Air Force personnel and is co-located with the MDA's Missile Defense Integration and Operation Center (MDIOC). This concentration of leadership from across the various agencies helps to streamline decision-making for those who command and operate the U.S. missile defense system.<sup>113</sup>

Command and control of the GMD system to defend the homeland utilizes the Ground-based Mid-course Defense Fire Control (GFC) system, which consists of "a suite of hardware, software, and specially trained personnel integrating GMD and supporting elements to manage all phases of engagement."<sup>114</sup> According to the MDA, "GMD employs integrated communications networks, fire control

systems, globally deployed sensors and Ground-Based Interceptors that are capable of detecting, tracking and destroying ballistic missile threats," and as of June 2023, 44 GBIs were "currently emplaced" at Fort Greeley in Alaska and Vandenberg Air Force Base in California.<sup>115</sup>

Once a missile is launched, data from the U.S. global network of sensors and radars travel through secure satellite communications and ground-based redundant communications lines to the Command Launch Equipment (CLE) software that can task GBIs to fire at the incoming missile. Then, once the NORTHCOM Commander—who becomes the supported commander during GMD execution—in consultation with the President has determined the most effective response to a missile threat, the CLE fire response option is relayed to the appropriate GBIs in the field.<sup>116</sup> When the selected missiles have been fired, they maintain contact with In-Flight Interceptor Communications System (IFICS) Data Terminals (IDTs) to receive updated flight information that helps to guide them to their target.<sup>117</sup>

To prepare for and execute GMD operations, the NORTHCOM Commander can also utilize situational awareness data from the Command and Control, Battle Management, and Communications (C2BMC) system. Through its software and network systems, C2BMC helps to process and integrate sensor information to provide a more complete picture of the battlespace.<sup>118</sup> The GMD Fire Control system acts as the primary decision aid for GMD execution, and the C2BMC system provides integrated battlefield awareness information before and during GMD operations.<sup>119</sup> It also provides information to other missile defense systems like THAAD and Patriot. Dozens of C2BMC workstations are distributed throughout the world at U.S. military bases.

C2BMC has undergone multiple technical upgrades (called spirals) since 2004 to bring more missile defense elements into the network. In 2019, the MDA completed an upgrade that will help to expand Aegis missile defense coverage by enabling Aegis Weapons Systems to engage by remote sensing.

Regional missile defense systems like THAAD, PAC-3, and Aegis are equipped with their own individual fire control systems to control the launch of their interceptors. The C2BMC system can also provide tracking information to individual missile defense batteries from other regional sensors. Aegis

BMD systems have onboard control governed by the Aegis Combat System and can provide their sensor data to the GMD system through C2BMC.<sup>120</sup>

C2BMC connects sensors and shooters around the world to a global network, but there is no comparable system to link sensors and shooters in a single region. The Army is developing the Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) to provide this capability. Once fielded, IBCS would connect all sensors and shooters in a region to a single fire control network.<sup>121</sup> Like IFPC, IBCS would also link defenses against smaller threats with ballistic missile defense.

A strong global command and control system is critical to missile defense because linking information from sensors can increase domain awareness and the time available to engage a target, thereby improving the probability of intercept. According to General VanHerck, “domain awareness” remains one of the challenges that makes homeland defense “a potential limiting factor to ensuring rapid and effective implementation and execution of global contingency plans.”<sup>122</sup> Domain awareness is especially important in dealing with cruise missile threats to the homeland—threats against which the U.S. has no comprehensive interceptor capability.

Continuing to upgrade the C2BMC system will remain critical to increasing the integration of missile defense elements across the world and therefore improving chances of intercept. For instance, it was revealed in 2021 that the MDA provided U.S. Indo-Pacific Command with a hypersonic missile defense capability, largely as a result of C2BMC improvements that allow sensors to see the threat sooner.<sup>123</sup> The MDA is expecting the LRDR’s operational acceptance in the fourth quarter of FY 2024 after a delay.<sup>124</sup> It also has linked C2BMC to the Army’s IBCS, and it was expected that the round of upgrades announced in August 2021 would further integrate those systems and enhance the threat data provided to the GMD system.<sup>125</sup>

The United States will need a more advanced command and control capability as global missile threats shift to include cruise and hypersonic missiles in addition to ballistic missiles. The DOD is currently developing a Joint All Domain C2 (JADC2) concept to integrate non-compatible sensors across all domains into a single network so that it can respond to a complex threat more efficiently.<sup>126</sup> Missile defense command and control

will strengthen as the services begin to field JADC2 capabilities.

In addition, NORTHCOM and the North American Aerospace Defense Command (NORAD) have conducted a series of Global Information Dominance Experiments (GIDE) that GIDE V Mission Commander Colonel Matthew Strohmeier describes as “an opportunity to stress-test our current systems and processes, introduce new technologies and approaches, and learn in an experimentation environment that replicates real-world operations.”<sup>127</sup> Sensor information can tend to exist in stovepipes, and if it is not integrated, the result can be failure to detect a threat.<sup>128</sup> GIDE also uses artificial intelligence and machine learning cues to ensure that the commander receives a full data picture.<sup>129</sup>

IBCS will provide an important improvement in regional missile defenses. The system will link all missile defense sensors and interceptors to one fire control center as opposed to today’s more stovepiped approach in which each unit operates its co-located sensor and launcher independently. By permitting air and missile defenses to function as a joint kill *web* rather than as a linear kill *chain*, IBCS will be able to determine the best shooter to take down an incoming missile, in turn increasing the defended battlespace.

The IBCS program has been approved for Full Rate Production in April 2023.<sup>130</sup> Advancements underway in missile defense command and control will become increasingly necessary to enable defense against the growing missile threat.

## Conclusion

By choice of successive presidential Administrations and Congresses, the United States does not have in place a comprehensive set of missile defense systems that would be capable of defending the homeland and allies from robust ballistic missile threats from Russia and China. U.S. efforts have focused on a limited architecture that protects the homeland from quantitatively small and qualitatively relatively less advanced threats and on deploying and advancing regional missile defense systems. The United States has not invested in space-based missile defense in any serious manner.

The United States has in place multiple types of capable interceptors, a vast sensor network, and a command and control system, but many elements



of the missile defense system need to be improved to defend against today's threat more efficiently, and the system would have to be rethought from the ground up should a decision be made to provide a comprehensive layered and robust defense of the homeland against Russian and Chinese missile threats. At the same time, the development of missile threats, both qualitative and quantitative, is outpacing the speed of missile defense research, development, and deployment to address those threats.

Senior leaders continue to stress the importance of U.S. missile defense, but if the nation is to realize the strategic benefits that missile defense provides, Congress and the Administration must ensure that the funding of critical programs like NGI, space sensors, and JADC2 is commensurate with their importance and that the nation is investing in future research and development, including missile defense in space.

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# Cyber Warfare and U.S. Cyber Command

James Di Pane

**T**he world of cyber operations is notoriously secretive. Nevertheless, even a rudimentary understanding of the domain, the threats and opportunities associated with it, and the ability of the Department of Defense (DOD) to protect the U.S. from cyberattack and enable military operations against enemies is of the greatest importance. To supplement the concise overview of military cyber capabilities provided in this discussion, two essays, “National Defense and the Cyber Domain” and “The Reality of Cyber Conflict: Warfare in the Modern Age,” from previous editions of the *Index of U.S. Military Strength* provide a wealth of information about the cyber domain and how it fits into the world of national defense.<sup>1</sup>

The vulnerability of allies and the private sector to cyberattacks can lead to complications for the military services that negatively affect the ability of the United States to sustain a war effort, thereby compromising our national security. But the need for cybersecurity goes beyond the Department of Defense alone. In the words of former Assistant Secretary of Defense for Homeland Defense and Global Security Kenneth P. Rapuano:

The increasingly provocative activities of key competitors, such as the NotPetya cyber operation conducted by Russia in February 2018, demonstrate how vulnerable the Department is to attacks against the many non-DoD-owned assets that are nevertheless critical to our ability to execute our missions. These assets include civilian ports, airfields, energy systems, and other critical infrastructure. Vulnerabilities in these areas will likely be targeted by our adversaries to disrupt military command and control, financial

operations, the functioning of operationally critical contractors, logistics operations, and military power projection, all without ever targeting the comparatively well-protected DoD Information Network. Any large-scale disruption or degradation of national critical infrastructure represents a significant national security threat.

To address these challenges, the DoD Cyber Strategy directs DoD to strengthen alliances and attract new partners to ensure that we are taking a whole-of-society approach and to enable better security and resilience of key assets....<sup>2</sup>

The use of cyber as a military tool to target enemy forces and capabilities falls into categories that are similar to those of other military operations.

- Cyber tools can be used in the form of conventional operations like the operations against the Islamic State that were used to disrupt command and control nodes and the group’s ability to distribute propaganda.<sup>3</sup> In this type of campaign, cyber supplements other military capabilities as a way to target enemy forces.
- Cyber also can take the form of special operations-type activity like the Stuxnet cyber operation against Iran, which could be compared to the U.S. Navy Seal raid to kill Osama Bin Laden.<sup>4</sup> In these operations, cyber is used to achieve targeted goals, sometimes in a covert way that, like special operations, falls below the threshold of traditional armed conflict.

In conventional operations, cyber is used to support forces and commanders by ensuring that they can operate uninhibited in cyberspace or by disrupting the enemy's ability to operate in order to achieve necessary objectives more effectively. In this way, cyber is used to gain an advantage over an adversary in much the same way advantage is sought in the other domains<sup>5</sup> (for example, when naval forces restrict the enemy's ability to use the seas to achieve strategic ends).

Like naval power, cyber is an important means with which to maximize one's own access and effectiveness while restricting the opponent's access and effectiveness. However, it differs from other domains in a very important respect: In cyber operations, time and space are incredibly compressed. A cyber force can launch an attack from anywhere in the world and strike very quickly; more traditional forces need time to move, are affected by terrain and weather, and must position themselves physically to launch attacks.

### U.S. Cyber Command

U.S. Cyber Command (USCYBERCOM) is a capability-based Unified Combatant Command similar to U.S. Special Operations Command and is the military's primary organization for both offensive and defensive cyber activity. It is currently commanded by U.S. Army General Paul Nakasone, who serves simultaneously as Director of the National Security Agency (NSA). The two organizations have a close cooperative relationship: The NSA and Cyber Command operate, respectively, under Title 50 and Title 10 of the U.S. Code, the sections that govern intelligence and military affairs.<sup>6</sup>

U.S. Cyber Command was founded in 2010 as a sub-unified command under U.S. Strategic Command. It was elevated to full Unified Combatant Command status by the Trump Administration in 2018 and reached full operational capability in the same year.<sup>7</sup> Over the past approximately 12 years, Cyber Command has grown from a very small organization that was largely dependent on the NSA for personnel and resources into the much more robust and independent organization that exists today.

In FY 2024, CYBERCOM will take on more "Service-like authorities" that "will allow it to deliver priority capabilities with agility and at speed." Specifically:

In Fiscal Year 2024, USCYBERCOM will assume control of the resources for the Cyber Mission Force cyberspace operations and capabilities. Enhanced budgetary control (EBC) gives USCYBERCOM the ability to directly allocate resources for greater efficiencies during the Department's programming phase and ensure they remain aligned with priorities through execution. EBC will lead to better alignment between USCYBERCOM responsibilities and authorities for cyberspace operations.<sup>8</sup>

### Missions

U.S. Cyber Command has a wide range of missions, from offensive and defensive operations to monitoring DOD networks and assisting with the defense of critical infrastructure. Its primary role is to ensure the DOD's ability to operate in a world that is increasingly dependent on cyber.

To this end, Cyber Command has three "enduring lines of operation." As described by General Nakasone, they are to:

- Provide mission assurance for the Department of Defense (DoD) by directing the operation and defense of the Department of Defense Information Networks (i.e. the DoDIN) and its key terrain and capabilities;
- Defeat strategic threats to the United States and its national interests; and
- Assist Combatant Commanders to achieve their missions in and through cyberspace.<sup>9</sup>

These "lines of operation" are critical to ensuring the success of the military enterprise and national defense, as any compromise in the ability to communicate or operate could jeopardize the full range of U.S. military activities.

A key part of these missions is the concept of "defending forward." As described in the 2018 DOD Cyber Strategy, "[t]his includes working with the private sector and our foreign allies and partners to contest cyber activity that could threaten Joint Force missions and to counter the exfiltration of sensitive DoD information."<sup>10</sup> According to a fact sheet on the 2023 DOD Cyber Strategy, "the Department recognizes that the United States' global network of Allies and partners represents a

foundational advantage in the cyber domain that must be protected and reinforced.”<sup>11</sup>

CYBERCOM defines “defending forward” as “actively disrupting malicious cyber activity before it can affect the U.S. Homeland.”<sup>12</sup> Passive defense, by contrast, involves monitoring within U.S. networks for intrusions. As noted, in the battlespace, cyber by its very nature compresses time and space, and attacks can emanate from anywhere in the world with similar speed. U.S. forces must therefore engage adversaries in their networks and work to disrupt attacks in their early stages, because it is often too late once the networks have been compromised.

U.S. Cyber Command physically deploys teams abroad to work alongside the cyber forces of partner nations to operate in selected networks.<sup>13</sup> Since 2018, U.S. Cyber Command has conducted “Hunt Forward” missions more than 40 times in more than 20 countries.<sup>14</sup> The U.S. completed one of these missions in Latvia in May 2023 and discovered malware at the end of a three-month defensive operation.<sup>15</sup> Cyber Command also completed its first “Hunt Forward” mission in support of U.S. Southern Command in Latin America in 2023, although it did not disclose which country it supported.<sup>16</sup>

### Cyber and the War in Ukraine

Russia’s invasion of Ukraine is significant for cyber because it shows how cyber can be used in conjunction with conventional military assets. While cyber was largely overshadowed by other aspects of Russia’s invasion like the movements of armor units and use of artillery, the Russians used it throughout as part of their overall war plan. This includes some notable operations that had effects beyond Ukraine. For example:

- The Russians targeted Viasat, an American satellite communications company that provided support to the Ukrainian military, with malware designed to erase its data before disabling it. Because the Russians did not limit the malware’s scope, it ended up affecting other ground satellite components, causing hundreds of thousands of people outside of Ukraine to lose electrical power and their connection to the Internet.<sup>17</sup>
- A cyberattack against the City Council of Odessa, a major Ukrainian port city situated

on the Black Sea, was timed to coincide with a cruise missile attack that was meant to disrupt Ukraine’s response to Russian forces attacking in the South.<sup>18</sup>

- Cyberattacks have also been launched against many parts of Ukraine’s infrastructure and government and civilian networks, including hospitals.<sup>19</sup>

These actions show that cyber operations are not limited to the military forces of combatants and, like World War II strategic bombing efforts, often extend to strike at infrastructure and areas of economic significance. The Russians continued to use cyber in Ukraine in 2023, reusing a malware program called Cadet Blizzard in February that was used originally in cyber-attacks in 2020.<sup>20</sup>

U.S. Cyber Command has provided analytic support and has sought additional ways to support Ukraine. It has deployed cyber teams to support both Ukraine and NATO allies, and those efforts have proved critical to protecting U.S. networks and critical infrastructure as well as those of NATO allies. Specifically, according to General Nakasone:

U.S. Cyber Command (with NSA) has been integral to the nation’s response to this crisis since Russian forces began deploying on Ukraine’s borders last fall. We have provided intelligence on the building threat, helped to warn U.S. government and industry to tighten security within critical infrastructure sectors, enhanced resilience on the DODIN [Department of Defense Information Networks] (especially in Europe), accelerated efforts against criminal cyber enterprises and, together with interagency members, Allies, and partners, planned for a range of contingencies.<sup>21</sup>

### Budget

Analyzing the budget for cybersecurity is difficult because of the degree of classification involved, but some data can be tracked with respect to USCYBERCOM and the broader Department of Defense. The Biden Administration’s FY 2024 DOD budget request includes \$13.5 billion for “cyberspace activities to defend and disrupt the efforts of advanced and persistent cyber adversaries, accelerate the transition to Zero Trust cybersecurity architecture,

and increase defense of U.S. critical infrastructure and defense industrial base partners against malicious cyberattacks.<sup>22</sup> The budget requests for FY 2023 and FY 2022, respectively, included \$11.2 billion<sup>23</sup> and \$10.4 billion<sup>24</sup> for cyberspace activities.

General Nakasone testified in March 2021 that “USCYBERCOM’s FY21 budget [was] roughly \$605 million, which covers the headquarters staff and the Cyber National Mission Force,” and that “27 different components shape the Department’s overall Cyber Activities Budget, which averages about \$10 billion a year.”<sup>25</sup> Given a 25 percent increase in budget authorities for cyber activities between FY 2021 and FY 2024, the DOD clearly believes that this area of competition is critical to success in defending the U.S. and its interests.

### Capacity

The operational arm of U.S. Cyber Command is its Cyber Mission Force (CMF), and CMF teams are distributed across various mission sets. In 2013, a force of 133 teams with 6,200 personnel was envisioned based on the mission requirements at that time. All 133 CMF teams reached full operational capability in 2018.<sup>26</sup>

CYBERCOM’s CMF teams are distributed across functional areas. The DOD’s FY 2023 budget overview lists a total of 133 active CFM teams:

- “13 National Mission Teams to defend the United States and its interests against cyber attacks”;
- “68 Cyber Protection Teams to defend DoD networks and systems against rapidly evolving threats and technologies in cyberspace”;
- “27 Combat Mission Teams to provide support to Combatant Commands by generating integrated cyberspace effects in support of operational plans and contingency operations”; and
- “25 Support Teams to provide analytic and planning support to National Mission and Combat Mission teams.”<sup>27</sup>

It further specifies “14 new CMF Teams [to be] created in FY 2022 and FY 2023 to support the Combatant Commanders in Space Operations and for countering cyber influence.”<sup>28</sup>

The teams are supported by four service components: Army Cyber Command (ARCYBER); Air Force Cyber Command (AFCYBER); Navy Fleet Cyber Command (FLTCYBER); and Marine Corps Forces Cyberspace Command (MARFORCYBER). These four commands, created when U.S. Cyber Command was created, provide the operational forces that make up the teams.

- ARCYBER supplies 41 teams to the CMF,<sup>29</sup>
- AFCYBER supplies 39 teams,<sup>30</sup>
- FLTCYBER supplies 40 teams,<sup>31</sup> and
- MARFORCYBER provides 13 teams.<sup>32</sup>

In April 2022, General Nakasone testified that Cyber Command had “approximately 6,000 Service members, including National Guard and Reserve personnel on active duty” in its 133 teams and was expecting to “grow by 14 teams over the next five years.”<sup>33</sup> In March 2023, the Congressional Research Service similarly reported that:

The CMF’s 133 teams comprise approximately 6,000 servicemembers and civilians, including reserve component personnel on active duty. Reportedly, DOD expected the CMF to add 14 more teams to the existing 133 between FY2022 and FY2024, with four teams to be added in FY2022 and five in FY2023. The growth is projected to add about 600 people, a 10% increase, to the CMF. The new CMF teams are to include both civilian and military personnel. Each military service is responsible for recruiting and training their own CMF units. CYBERCOM has reported that it is in the process of centralizing advanced cyber training, with the Army serving as the executive agent.<sup>34</sup>

In addition, there is the Cyber Excepted Service (CES), “a DOD enterprise-wide personnel system for managing defense civilians in the cyber workforce.”

Congress established the authorities for this system as part of the FY2016 NDAA, and these provisions provide DOD with flexible tools to attract and retain civilians with cyber skills.

Prior to this law's enactment a majority of cyber positions were in the competitive service; certain existing competitive service employees were offered the opportunity to convert to CES. The DOD Chief Information Officer (CIO) is responsible for developing CES policy and providing recommended policy issuances to the Undersecretary of Defense for Personnel and Readiness. According to the DOD CIO's office, as of September 2022 there were 15,000 department employees in the CES, and the Department planned to expand the number of CES positions in coming years.<sup>35</sup>

Recruiting and retaining cyber talent is one of the key challenges for U.S. Cyber Command, which has invested in retention and incentive programs in an effort to keep the talent it cultivates. The high demand for cyber personnel in the private sector makes this challenge a difficult one.

### **Capability**

As noted at the outset, the world of cyber operations is notoriously secretive, and much is classified. Thus, analyzing USCYBERCOM's capability as reflected in open-source (unclassified) literature is nearly impossible. However, the United States is viewed as one of the world's most capable cyber actors—an assessment that is based on its wide range of infrastructure and strategies and the advanced technologies that the U.S. is known to employ.<sup>36</sup>

### **Readiness**

Because of the lack of open-source reporting, it also is nearly impossible to assess the readiness of America's cyber forces. The U.S. Government Accountability Office has identified some issues of training consistency in the past.<sup>37</sup> Standardizing and improving training is one of the main priorities for U.S. Cyber Command, along with retaining its talent, and both are critical to maintaining readiness.

### **Conclusion**

Cyber is a key domain for the U.S. military. It also is increasingly important in the modern world generally. As seen in the various breaches and ransomware attacks that have come to light, cybersecurity for defense extends well beyond the Department of Defense. For the Joint Force, cyber supports military capabilities by ensuring that U.S. forces can operate in cyberspace without disruption, by making it difficult for enemies to conduct their own operations, and by conducting independent operations against targets as directed to achieve specified goals.

Within the DOD, U.S. Cyber Command bears the primary responsibility for the full spectrum of military cyber operations. Having reached its authorized manning levels, USCYBERCOM has shifted its focus to training the force to ensure that it will be as capable as possible in helping to advance and protect the nation's interests.

## Endnotes

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## Conclusion: U.S. Military Power

The Active Component of the U.S. military is two-thirds the size it should be, operates equipment that is older than it should be, and is burdened by readiness levels that are more problematic than they should be. To the extent that progress has been made, it has been at the expense of both capacity and modernization. Accordingly, this *Index* assesses:

- **The Army as “Marginal.”** Based on the historical use of its ground forces in combat, the Army has less than two-thirds of the forces in its Active Component that it would need to handle more than one major regional conflict (MRC). This shortfall in capacity might be offset if the modernity or technological capability of its forces were very high, but this is not the case. The Army has fully committed to modernizing its forces for great-power competition, but its programs are still in their development phase, and it will be a few years before they are ready for acquisition and fielding.

In other words, the Army is aging faster than it is modernizing, and an 8 percent decrease in fiscal year (FY) 2024 procurement and research and development (R&D) funding only adds to the problem. The Army remains “weak” in capacity with 62 percent of the force it should have but has significantly increased the force’s readiness, exceeding its own internal requirement that 66 percent of its Brigade Combat Teams (BCTs) must be at the highest readiness levels, thereby scoring the highest level of “very strong.” However, with operational training being pushed down to the company level below battalion and brigade, it is unclear how ready the Army’s brigades actually are or how effective they would be in combat.

The Army has a better sense of what it needs for war against a peer, but funding uncertainties could threaten the ability of the service to realize its goals.

- **The Navy as “Weak.”** The technology gap between the Navy and its peer competitors is narrowing in favor of competitors, and the Navy’s ships are aging faster than they are being replaced. The fleet is too small relative to workload, and supporting shipyards are overwhelmed by the repair work that is needed to make more ships available. This inadequate maintenance infrastructure prevents ships in repair from returning to the fleet in a timely manner, which in turn causes readiness problems as steaming days needed to train crews to levels of proficiency are lost. The Navy is projected to have a fleet of 280 ships by 2037, which is smaller than the current force of 298 and well below the 400 needed to meet operational demands. Current and projected funding shortfalls will make it harder to deal effectively with any of these serious deficiencies. This leaves the Navy unable to arrest and reverse the decline of its fleet as adversary forces grow in number and capability.
- **The Air Force as “Very Weak.”** The Air Force has deployed an average of 28 fighter squadrons to major theaters of war since the end of World War II. This equates to 500 Active Component fighter aircraft to execute one MRC. Adding a planning factor of 20 percent for spares and attrition brings the number to 600 aircraft. An Air Force able to manage more than a single major conflict would necessarily require 1,200 active-duty, combat-coded fighter aircraft. Currently, the service has 897,

## U.S. Military Power: Army

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

## U.S. Military Power: Navy

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

## U.S. Military Power: Air Force

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

## U.S. Military Power: Marine Corps

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

## U.S. Military Power: Space

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

## U.S. Military Power: Nuclear

|                                | VERY WEAK | WEAK | MARGINAL | STRONG | VERY STRONG |
|--------------------------------|-----------|------|----------|--------|-------------|
| Nuclear Stockpile              |           |      |          | ✓      |             |
| Delivery Platform Reliability  |           |      | ✓        |        |             |
| Warhead Modernization          |           |      | ✓        |        |             |
| Delivery Systems Modernization |           |      |          | ✓      |             |
| Nuclear Weapons Complex        |           |      | ✓        |        |             |
| National Labs Talent           |           |      | ✓        |        |             |
| Allied Assurance               |           |      |          | ✓      |             |
| <b>OVERALL</b>                 |           |      | ✓        |        |             |

three-quarters of what is needed as assessed by this *Index*. The service’s inventory of bombers is worse at 64 percent.

Accounting for better inventories in aerial refuelers and strategic lift aircraft, the USAF currently is at 83 percent of the capacity required to meet a two-MRC benchmark. However, the geographic disposition of these aircraft limits the service’s ability to deploy them rapidly to a crisis region, and its ability to replace combat losses is highly questionable because of low mission capability rates (a function of maintenance and trained crews). As a result, the USAF could likely handle only a single major conflict, and that only by resorting to global sourcing, leaving it unable to do much else.

New F-35 and KC-46 aircraft continue to roll off their respective production lines but in small numbers that are more than offset by aircraft retirements. Incredibly low sortie rates and flying hours across every pilot community will prevent any Air Force combat-coded fighter squadron from being able to execute all or even most of its wartime mission. At best, half of the cadre of pilots within the most capable units will be able to execute just “some” of the unit’s wartime missions. There is not a fighter squadron in the Air Force that holds the readiness levels, competence, and confidence levels required to square off against a peer competitor, and readiness continues to spiral downward.

As with a three-legged stool, success or failure is determined by the weakest leg. The shortage of pilots and flying time for those pilots degrades the ability of the Air Force to generate the quality of combat air power that would be needed to meet wartime requirements even if aircraft production was higher and a larger percentage of the Air Force was comprised of newer aircraft.

- **The Marine Corps as “Strong.”** The score for the Marine Corps was raised from “marginal” to “strong” in the *2022 Index* and has remained “strong” for two reasons: because the Corps’ capacity is measured against a one-war requirement rather than the two-war requirement to which the other services are held and because the Corps has made extraordinary, sustained efforts to modernize, which improves capability, and enhance its readiness during the assessed year.

Of the five services, the Marine Corps is the only one that has a compelling story for change, has a credible and practical plan for change, and is effectively implementing its plan to change. However, in the absence of additional funding in FY 2024, if the Corps retains its intention to reduce the number of its battalions from 22 to 21, this reduction will limit the extent to which it can conduct distributed operations as it envisions and to replace combat losses (thus limiting its ability to sustain operations). The Corps is already at 73 percent of the battalions and related air and logistical capabilities it should have. It needs to grow.

Though the service remains hampered by old equipment in some areas, it has nearly completed modernization of its entire aviation component, is making good progress in fielding a new amphibious combat vehicle, is fast-tracking the acquisition of new anti-ship and anti-air weapons, and is aggressively leveraging developments in unmanned systems and advanced computing and communication technologies. Full realization of its redesign plan will require the acquisition of a new class of amphibious ships, for which the Corps needs support from the Navy. The Corps is still too small and has no stated desire to grow, but it possesses fairly modern equipment, especially its air arm, and is wholly committed to adapting as rapidly as possible to meet the challenges of an evolving threat environment.

- **The Space Force as “Marginal.” The Space Force has risen from “weak” in the 2023 Index to “marginal.”** The service doubled its counterspace weapons systems with the Ascent and Tetra-1 satellites, adding the first two known offensive systems to its portfolio. Other counterspace systems are probably being developed or, like cyber, are already in play without public announcement. Nevertheless, the USSF’s current visible capacity is not sufficient to support, fight, or weather a war with a peer competitor.

The numbers and types of Backbone and intelligence, surveillance, and reconnaissance (ISR) assets are sufficient to support global positioning, navigation, and timing (PNT) requirements and the majority of strategic-level communications, imagery, and collection requirements of the National Command Authorities and the Department of Defense. But while that capacity is growing, the Space Force is not capable of meeting current—much less future—on-demand, operational, and tactical-level warfighter requirements. The service’s asset modernization plan has significantly accelerated the delivery of systems to the force over the past year, elevating USSF capabilities, but a majority of Backbone and ISR assets have exceeded their designed life spans, and the Department of the Air Force has been willing to

delay and/or defer the acquisition of replacement systems. The capability of these satellites is marginal, but the service has narrowed gaps in space situational awareness and defensive and offensive capabilities.

The mission sets, space assets, and personnel that transitioned to the Space Force and those that have been assigned to support the USSF from the other services have not missed an operational beat since the Space Force stood up in 2019. However, there is little evidence that the USSF has improved its readiness to provide nearly real-time support to operational and tactical levels of force operations or that it is ready to execute defensive and offensive counterspace operations to the degree that Congress envisioned when it authorized creation of the Space Force.

- **America’s Nuclear Capability as “Marginal.”** The status of U.S. nuclear weapons must be considered in the context of a threat environment that is significantly more dangerous than it was in previous years. Until recently, U.S. nuclear forces needed to address one nuclear peer rather than two or more. Given a U.S. failure to adapt rapidly enough to these developments and the Biden Administration’s decision to cancel or delay various programs that affect the nuclear portfolio, overall U.S. nuclear weapons capability is assessed as “marginal,” down from “strong” in the 2023 Index. U.S. nuclear forces face many risks that without the continued bipartisan commitment to a strong deterrent could warrant an eventual decline to an overall score of “weak” or “very weak.”

The reliability of current U.S. delivery systems and warheads is at risk as they continue to age and the threat continues to advance, and the fragility of “just in time” replacement programs only exacerbates this risk. In fact, nearly all components of the nuclear enterprise are at a tipping point with respect to replacement or modernization and have no margin left for delays in schedule—delays that appear to be occurring despite the best efforts of the enterprise. Since every other military operation—and therefore overall national defense—relies

on a strong nuclear deterrent, the United States cannot afford to fall short in fulfilling this imperative mission. Future assessments will need to consider plans to adjust America's nuclear forces to account for the doubling of peer nuclear threats. It is clear that the change in threat warrants a reexamination of U.S. force posture and the adequacy of our current modernization plans. Failure to keep modernization programs on track while planning for a three-party (or more) nuclear peer dynamic could lead to a further decline in the strength of U.S. nuclear deterrence.

**In the aggregate, America's overall military posture must be rated "weak."** The Air Force is rated "very weak," the Navy and Space Force as "weak," and the U.S. Army and the nuclear forces as "marginal." The Marine Corps is "strong," but the Corps is a one-war force, and its overall strength is therefore not sufficient to compensate for the shortfalls of its larger fellow services. Moreover, if the United States should need to employ nuclear weapons, the escalation into nuclear conflict would seem to imply that handling such a crisis would challenge even a fully ready Joint Force at its current size and equipped with modern weapons. Additionally, the war in Ukraine, which threatens the economic and political stability not just of Europe, but of other regions as well, shows that some actors (in this case Russia) will not necessarily be deterred from conventional action even though the U.S. maintains a strong nuclear capability. Thus, strong conventional forces of necessary size are essential to America's ability to respond to emergent crises in areas of special interest.

The *2024 Index* concludes that the current U.S. military force is at significant risk of being unable to meet the demands of a single major regional conflict while also attending to various presence and engagement activities. The force would probably not be able to do more and is certainly ill-equipped to handle two nearly simultaneous MRCs—a situation that is made more difficult by the generally weak condition of key military allies.

In general, the military services continue to prioritize readiness and have made some progress over the past few years, but modernization programs, especially in shipbuilding and production of fifth-generation combat aircraft, continue to suffer

as resources are committed to preparing for the future, recovering from 20 years of operations, and offsetting the effects of inflation. With respect to the Air Force, some of its limited acquisition funds are being spent on aircraft of questionable utility in high-threat scenarios while R&D receives a larger share of funding than efforts meant to replace quite aged aircraft are receiving. As observed in the 2021, 2022, and 2023 editions of the *Index*, the services have normalized reductions in the size and number of military units, the forces remain well below the level needed to meet the two-MRC benchmark, and the substantial difficulties involved in trying to recruit young Americans to join the military services are frustrating even modest proposals to maintain service end strength.

Congress and the Administration took positive steps to stabilize funding in the latter years of the Budget Control Act of 2011 (BCA), thereby mitigating the worst effects of BCA-restricted funding, but sustained investment in rebuilding the force to ensure that America's armed services are properly sized, equipped, trained, and ready to meet the missions they are called upon to fulfill will be critical. This is amplified by the extent to which the United States has drawn from its inventories of munitions and equipment to support Ukraine's defense and the extent to which the defense industry has been limited in its ability to replenish depleted stocks, much less support the expansion and deepening of U.S. capabilities in preparation for any other conflict. The Administration's proposed defense budget for FY 2024 falls far short of what the services need to regain readiness and replace aged equipment, and proposals advanced in the House and Senate<sup>1</sup> account for barely half of the current rate of inflation, which averaged 8 percent in calendar year 2022 and 4.6 percent during the first six months of 2023.<sup>2</sup>

As currently postured, the U.S. military is at significant risk of not being able to defend America's vital national interests with assurance. It is rated as "weak" relative to the force needed to defend national interests on a global stage against actual challenges in the world *as it is* rather than as we wish it were. This is the inevitable result of years of sustained use, underfunding, poorly defined priorities, wildly shifting security policies, exceedingly poor discipline in program execution, and a profound lack of seriousness across the national

security establishment even as threats to U.S. interests have surged.

In 2023, this has been compounded by the cost of U.S. support for Ukraine's defense against Russia's assault, which is further exacerbated by the limited ability of allies in Europe to shoulder a greater share of the support burden. The war has laid bare the limited inventories of equipment, munitions, and supplies of all supporting countries as well as the limitations of the industrial base that will be required to replenish them.

## Endnotes

1. At \$842 billion, the defense budget for FY 2024 proposed by the White House is 3.2 percent higher than the \$816 billion proposed for FY 2023. The \$832 billion proposed by the Senate represents an increase of 2 percent (or 3.5 percent depending on one's reference point for what constitutes defense spending). The proposal voted out of the House Appropriations Committee generally aligns with the Senate's, but as this book was being prepared, it had not been subject to a vote of the full House. All of these numbers fall well below the current rate of inflation. See Chart, "DoD Topline Growth FY22–FY23–FY24 Budgets," in U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller/Chief Financial Officer), *United States Department of Defense Fiscal Year 2024 Budget Request*, PowerPoint Presentation, March 2023, p. 3, [https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024\\_Budget\\_Request.pdf](https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2024/FY2024_Budget_Request.pdf) (accessed August 22, 2023); news release, "Bill Summary: Defense Fiscal Year 2024 Appropriations Bill," Committee on Appropriations, U.S. Senate, July 27, 2023, <https://www.appropriations.senate.gov/news/majority/bill-summary-defense-fiscal-year-2024-appropriations-bill> (accessed August 22, 2023); and press release, "Committee Approves FY24 Defense Bill," Committee on Appropriations, U.S. House of Representatives, June 22, 2023, <https://appropriations.house.gov/news/press-releases/committee-approves-fy24-defense-bill> (accessed August 22, 2023).
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# Glossary of Abbreviations

## A

|                  |  |
|------------------|--|
| <b>A2/AD</b>     | anti-access/area denial                              |
| <b>AAG</b>       | Advanced Arresting Gear                              |
| <b>AAMDS</b>     | Aegis Ashore Missile Defense System                  |
| <b>AAV</b>       | Amphibious Assault Vehicle                           |
| <b>ABCT</b>      | Armored Brigade Combat Team                          |
| <b>ABM</b>       | Ansar Bayt al-Maqdis                                 |
| <b>ABMS</b>      | Airborne Battle Management System                    |
| <b>ACF</b>       | Army contingency force                               |
| <b>ACV</b>       | Amphibious Combat Vehicle                            |
| <b>ADIZ</b>      | Air Defense Identification Zone                      |
| <b>ADMM-Plus</b> | ASEAN Defence Ministers Meeting-Plus                 |
| <b>AEHF</b>      | Advanced Extremely High Frequency (satellite system) |
| <b>AEW</b>       | airborne early warning                               |
| <b>AFAFRICA</b>  | U.S. Air Forces Africa                               |
| <b>AFCYBER</b>   | U.S. Air Force Cyber Command                         |
| <b>AFP</b>       | Armed Forces of the Philippines                      |
| <b>AFRICOM</b>   | U.S. Africa Command                                  |
| <b>AFSOC</b>     | U.S. Air Force Special Operations Command            |
| <b>AFTA</b>      | ASEAN Free Trade Area                                |
| <b>AIP</b>       | Air Independent Propulsion                           |
| <b>AIT</b>       | American Institute in Taiwan                         |
| <b>AMDR</b>      | Air and Missile Defense Radar                        |
| <b>AME</b>       | aeromedical evacuation                               |
| <b>AMPV</b>      | Armored Multipurpose Vehicle                         |
| <b>ANSF</b>      | Afghan National Security Forces                      |
| <b>AN/TPY-2</b>  | Army Navy/Transportable Radar Surveillance           |
| <b>ANZUS</b>     | Australia–New Zealand–U.S. Security Treaty           |
| <b>AOR</b>       | area of responsibility                               |
| <b>APC</b>       | armored personnel carrier                            |
| <b>APS</b>       | Army Prepositioned Stocks                            |
| <b>AQAP</b>      | Al-Qaeda in the Arabian Peninsula                    |
| <b>AQI</b>       | Al-Qaeda in Iraq                                     |
| <b>AQIM</b>      | Al-Qaeda in the Islamic Maghreb                      |
| <b>ARC</b>       | Active Reserve Component                             |
| <b>ARCYBER</b>   | U.S. Army Cyber Command                              |
| <b>ARF</b>       | ASEAN Regional Forum                                 |
| <b>ARG</b>       | amphibious ready group                               |
| <b>ARNG</b>      | Army National Guard                                  |

|               |  |
|---------------|--|
| <b>ASAT</b>   | anti-satellite                         |
| <b>ASBM</b>   | anti-ship ballistic missile            |
| <b>ASEAN</b>  | Association of Southeast Asian Nations |
| <b>ASG</b>    | Abu Sayyaf Group                       |
| <b>ASUW</b>   | anti-surface warfare                   |
| <b>ASW</b>    | anti-submarine warfare                 |
| <b>AUSMIN</b> | Australia–United States Ministerial    |
| <b>AW</b>     | air warfare                            |
| <b>AWACS</b>  | Airborne Warning and Control System    |

## B

|             |  |
|-------------|--|
| <b>BBA</b>  | Bipartisan Budget Act of 2015            |
| <b>BCA</b>  | Budget Control Act of 2011               |
| <b>BCT</b>  | Brigade Combat Team                      |
| <b>BCW</b>  | biological and chemical weapons          |
| <b>BDCA</b> | border defense cooperation agreement     |
| <b>BECA</b> | Basic Exchange and Cooperation Agreement |
| <b>BJP</b>  | Bharatiya Janata Party                   |
| <b>BMD</b>  | ballistic missile defense                |
| <b>BUR</b>  | Bottom-Up Review                         |
| <b>BVR</b>  | beyond visual recognition                |

## C

|                |   |
|----------------|---|
| <b>C2</b>      | command and control   |
| <b>C4ISR</b>   | command, control, communications, computers, intelligence, surveillance, and reconnaissance |
| <b>CA</b>      | civil affairs   |
| <b>CAB</b>     | Combat Aviation Brigade   |
| <b>CAPE</b>    | Cost Assessment and Program Evaluation  |
| <b>CATOBAR</b> | conventional takeoff/barrier landing  |
| <b>CBO</b>     | Congressional Budget Office   |
| <b>CCG</b>     | Chinese Coast Guard   |
| <b>CCP</b>     | Chinese Communist Party   |
| <b>CCT</b>     | Combat Controller Team  |
| <b>CELAC</b>   | Community of Latin American and Caribbean States  |
| <b>CENTCOM</b> | U.S. Central Command  |
| <b>CFC</b>     | Combined Forces Command (South Korea–U.S.)  |
| <b>CFSCC</b>   | Combined Force Space Component Command  |
| <b>CFT</b>     | Cross-Functional Team   |
| <b>CHAMSI</b>  | Cooperative Humanitarian and Medical Storage Initiative                                     |
| <b>CI</b>      | Counterinsurgency   |
| <b>CIA</b>     | Central Intelligence Agency   |



|                 |   |
|-----------------|---|
| <b>CISMOA</b>   | Communications and Information Security Memorandum of Agreement |
| <b>CJTF-HOA</b> | Combined Joint Task Force–Horn of Africa                        |
| <b>CLF</b>      | Combat Logistics Force  |
| <b>CLU</b>      | Command Launch Units  |
| <b>CMF</b>      | Cyber Mission Force   |
| <b>CMRR</b>     | Chemistry and Metallurgy Research Replacement                   |
| <b>CMT</b>      | combat mission team   |
| <b>COCOM</b>    | Combatant Command   |
| <b>CONUS</b>    | continental United States                                       |
| <b>COVID-19</b> | Coronavirus Disease 2019  |
| <b>CPMIEC</b>   | China Precision Machinery Import–Export Corporation             |
| <b>CPT</b>      | Cyber Protection Team   |
| <b>CRS</b>      | Congressional Research Service                                  |
| <b>CSF</b>      | coalition support funds   |
| <b>CSG</b>      | carrier strike group  |
| <b>CSO</b>      | Chief of Space Operations                                       |
| <b>CSO</b>      | Critical Skills Operator  |
| <b>CT</b>       | Counterterrorism  |
| <b>CTC</b>      | Combat Training Center  |
| <b>CTF</b>      | Combined Task Force   |
| <b>CTIC</b>     | Counter Terrorism Information Center                            |
| <b>CVN</b>      | aircraft carrier, nuclear powered                               |
| <b>CVW</b>      | carrier air wing  |
| <b>CW</b>       | chemical warfare  |
| <b>CYBERCOM</b> | U.S. Cyber Command  |
| <b>CYOC</b>     | Cyberspace Operations Centre                                    |

## D

|               |  |
|---------------|--|
| <b>D2D</b>    | deployment-to-dwell                                  |
| <b>DA-KKV</b> | direct-ascent kinetic-kill vehicle                   |
| <b>DAF</b>    | Department of the Air Force                          |
| <b>DCA</b>    | defense cooperation agreement                        |
| <b>DDOS</b>   | distributed denial of service                        |
| <b>DDPR</b>   | Deterrence and Defense Posture Review                |
| <b>DIANA</b>  | Defence Innovation Accelerator of the North Atlantic |
| <b>DIME</b>   | diplomatic, informational, military, and economic    |
| <b>DMSP</b>   | Defense Meteorological Satellite Program             |
| <b>DMZ</b>    | demilitarized zone                                   |
| <b>DNI</b>    | Director of National Intelligence                    |
| <b>DoAF</b>   | Department of the Air Force                          |
| <b>DOD</b>    | U.S. Department of Defense                           |
| <b>DOE</b>    | U.S. Department of Energy                            |

|             |   |
|-------------|---|
| <b>DON</b>  | U.S. Department of the Navy                         |
| <b>DOS</b>  | denial of service                                   |
| <b>DPRK</b> | Democratic People's Republic of Korea (North Korea) |
| <b>DSCA</b> | Defense Security Cooperation Agency                 |
| <b>DSCS</b> | Defense Satellite Communications System             |
| <b>DSG</b>  | Defense Strategic Guidance                          |
| <b>DSR</b>  | Defense Strategic Review                            |
| <b>DTTI</b> | Defense Trade and Technology Initiative             |

## E

|               |   |
|---------------|---|
| <b>EAC</b>    | enhanced air cooperation                            |
| <b>eAP</b>    | enhanced Air Policing                               |
| <b>EADRCC</b> | Euro-Atlantic Disaster Response Coordination Centre |
| <b>EAS</b>    | European Activity Set                               |
| <b>EBO</b>    | effects-based operations                            |
| <b>ECP</b>    | engineering change proposal                         |
| <b>EDA</b>    | excess defense articles                             |
| <b>EDCA</b>   | Enhanced Defense Cooperation Agreement              |
| <b>EDI</b>    | European Defense Initiative                         |
| <b>EEZ</b>    | exclusive economic zone                             |
| <b>EFP</b>    | Enhanced Forward Presence                           |
| <b>EFV</b>    | Expeditionary Fighting Vehicle                      |
| <b>EMALS</b>  | Electromagnetic Aircraft Launch System              |
| <b>EMD</b>    | engineering and manufacturing development           |
| <b>EMP</b>    | electromagnetic pulse                               |
| <b>EOD</b>    | explosive ordnance disposal                         |
| <b>ERIP</b>   | European Recapitalization Incentive Program         |
| <b>ESG</b>    | Expeditionary Strike Group                          |
| <b>EU</b>     | European Union                                      |
| <b>EUCOM</b>  | U.S. European Command                               |
| <b>EW</b>     | electronic warfare                                  |
| <b>EWS-G1</b> | Electro-Optical Infrared Weather System             |

## F

|                  |                                       |
|------------------|---------------------------------------|
| <b>FATA</b>      | Federally Administered Tribal Areas   |
| <b>FATF</b>      | Financial Action Task Force           |
| <b>FCS</b>       | Future Combat System                  |
| <b>FLTCYBER</b>  | U.S. Navy Fleet Cyber Command         |
| <b>FLTSATCOM</b> | Fleet Satellite Communications System |
| <b>FOC</b>       | full operational capability           |
| <b>FONOP</b>     | freedom of navigation operation       |

|              |                              |
|--------------|------------------------------|
| <b>FRAGO</b> | fragmentary order            |
| <b>FSTM</b>  | full spectrum training miles |
| <b>FTA</b>   | free trade agreement         |
| <b>FY</b>    | fiscal year                  |
| <b>FYDP</b>  | Future Years Defense Program |

## G

|               |   |
|---------------|---|
| <b>GAO</b>    | Government Accountability Office (formerly General Accounting Office) |
| <b>GATOR</b>  | Ground/Air Task Oriented Radar  |
| <b>GCC</b>    | geographic combatant commander  |
| <b>GCC</b>    | Gulf Cooperation Council  |
| <b>GCV</b>    | Ground Combat Vehicle   |
| <b>GDP</b>    | gross domestic product  |
| <b>GEO</b>    | geosynchronous orbit  |
| <b>GFMAP</b>  | Global Force Management Allocation Plan                               |
| <b>GMV</b>    | Ground Mobility Vehicle   |
| <b>GPF</b>    | general purpose forces  |
| <b>GPS</b>    | Global Positioning System   |
| <b>GSOMIA</b> | General Security of Military Information Agreement                    |

## H

|              |   |
|--------------|---|
| <b>HA/DR</b> | humanitarian assistance/disaster relief             |
| <b>HEO</b>   | highly elliptical orbit                             |
| <b>HMMWV</b> | High Mobility Multipurpose Wheeled Vehicle (HUMVEE) |
| <b>HVE</b>   | homegrown violent extremist                         |

## I

|                  |   |
|------------------|---|
| <b>IAMD</b>      | Integrated Air and Missile Defense        |
| <b>IBCT</b>      | Infantry Brigade Combat Team              |
| <b>ICBM</b>      | intercontinental ballistic missile        |
| <b>ICS</b>       | industrial control systems                |
| <b>ICT</b>       | Information and communications technology |
| <b>IDF</b>       | Israel Defense Forces                     |
| <b>IED</b>       | improvised explosive device               |
| <b>IFPC</b>      | indirect fire protection capability       |
| <b>IFV</b>       | infantry fighting vehicle                 |
| <b>IMF</b>       | International Monetary Fund               |
| <b>INDOPACOM</b> | U.S. Indo-Pacific Command                 |
| <b>INEW</b>      | Integrated Network Electronic Warfare     |

|              |  |
|--------------|--|
| <b>INF</b>   | Intermediate-Range Nuclear Forces (treaty)     |
| <b>INFSA</b> | Integrated Naval Force Structure Assessment    |
| <b>IOC</b>   | initial operating capability                   |
| <b>IRGC</b>  | Islamic Revolutionary Guard Corps              |
| <b>ISAF</b>  | International Security Assistance Force        |
| <b>ISIL</b>  | Islamic State of Iraq and the Levant           |
| <b>ISIS</b>  | Islamic State of Iraq and Syria                |
| <b>ISR</b>   | intelligence, surveillance, and reconnaissance |

## J

|                  |   |
|------------------|---|
| <b>JCPOA</b>     | Joint Comprehensive Plan of Action                |
| <b>JeM</b>       | Jaish-e-Mohammed                                  |
| <b>JLTV</b>      | Joint Light Tactical Vehicle                      |
| <b>JOAC</b>      | Joint Operational Access Concept                  |
| <b>JP</b>        | joint publication                                 |
| <b>JSF</b>       | Joint Strike Fighter (F-35 Lightning II)          |
| <b>JSOC</b>      | Joint Special Operations Command                  |
| <b>JSOTF-P</b>   | Joint Special Operations Task Force–Philippines   |
| <b>JSTARS</b>    | Joint Surveillance and Target Attack Radar System |
| <b>JTF North</b> | Joint Task Force North                            |
| <b>JTF–SD</b>    | Joint Task Force–Space Defense                    |
| <b>JuD</b>       | Jamaat-ud-Dawa                                    |

## K

|               |   |
|---------------|---|
| <b>KATUSA</b> | Korean Augmentees to the United States Army |
| <b>KFOR</b>   | Kosovo Force                                |

## L

|              |  |
|--------------|--|
| <b>LAC</b>   | Line of Actual Control                       |
| <b>LAF</b>   | Lebanese Armed Forces                        |
| <b>LAV</b>   | Light Armored Vehicle                        |
| <b>LCAC</b>  | Landing Craft Air Cushion Vehicle            |
| <b>LCS</b>   | Littoral Combat Ship                         |
| <b>LCT</b>   | Littoral Combat Team                         |
| <b>LEMOA</b> | Logistics Exchange Memorandum of Agreement   |
| <b>LeT</b>   | Lashkar-e-Taiba                              |
| <b>LFP</b>   | lead force package                           |
| <b>LHA</b>   | landing helicopter assault (amphibious ship) |
| <b>LHD</b>   | landing helicopter dock (amphibious ship)    |

|              |  |
|--------------|--|
| <b>LNG</b>   | liquefied natural gas  |
| <b>LoC</b>   | Line of Control  |
| <b>LPD</b>   | landing platform/dock or amphibious transport dock (amphibious ship) |
| <b>LPDE</b>  | Long Duration Propulsive Evolved Expendable Launch Vehicle           |
| <b>LRA</b>   | Lord's Resistance Army   |
| <b>LRASM</b> | long range anti-ship missiles  |
| <b>LRDR</b>  | long range discrimination radar                                      |
| <b>LRIP</b>  | low-rate initial production  |
| <b>LRS-B</b> | Long-Range Strike Bomber   |
| <b>LSD</b>   | landing ship, dock (amphibious ship)                                 |

## M

|                    |  |
|--------------------|--|
| <b>MAGTF</b>       | Marine Air-Ground Task Force   |
| <b>MANPADS</b>     | man-portable air-defense systems   |
| <b>MARCENT</b>     | U.S. Marine Corps Forces Central Command                                 |
| <b>MARFORAF</b>    | U.S. Marine Corps Forces Africa  |
| <b>MARFORCYBER</b> | U.S. Marine Corps Forces Cyberspace Command                              |
| <b>MARFOREUR</b>   | U.S. Marine Corps Forces Europe  |
| <b>MARFORPAC</b>   | U.S. Marine Corps Forces, Pacific  |
| <b>MARSOC</b>      | Marine Forces Special Operations Command                                 |
| <b>MAWI</b>        | Multinational Ammunition Warehousing Initiative                          |
| <b>MCM</b>         | mine countermeasure (ship)   |
| <b>MCMV</b>        | mine countermeasure vessel (ship)  |
| <b>MCO</b>         | major combat operation (see MRC, MTW)                                    |
| <b>MDAP</b>        | Major Defense Acquisition Program  |
| <b>MDO</b>         | multi-domain operations  |
| <b>MDT</b>         | mutual defense treaty  |
| <b>MDTF</b>        | Multi-Domain Task Forces   |
| <b>MEB</b>         | Marine Expeditionary Brigade   |
| <b>MEF</b>         | Marine Expeditionary Force   |
| <b>MEU</b>         | Marine Expeditionary Unit  |
| <b>Milstar</b>     | Military Strategic and Tactical Relay                                    |
| <b>MINUSMA</b>     | United Nations Multidimensional Integrated Stabilization Mission in Mali |
| <b>MIRV</b>        | multiple independently targetable reentry vehicles                       |
| <b>MISO</b>        | Military Information Support Operations                                  |
| <b>MLR</b>         | Marine Littoral Regiment   |
| <b>MNLA</b>        | National Movement for the Liberation of Azawad                           |
| <b>MNLF</b>        | Moro National Liberation Front   |
| <b>MNNA</b>        | major non-NATO ally  |
| <b>MOJWA</b>       | Movement for Oneness and Jihad in West Africa                            |
| <b>MPC</b>         | Marine Personnel Carrier   |
| <b>MPS</b>         | Maritime Prepositioning Ships  |

|             |   |
|-------------|---|
| <b>MRAP</b> | Mine-Resistant Ambush-Protected (vehicle) |
| <b>MRBM</b> | medium-range ballistic missile            |
| <b>MRC</b>  | major regional conflict (see MTW, MCO)    |
| <b>MRF</b>  | Marine Rotational Force                   |
| <b>MSI</b>  | Maritime Security Initiative              |
| <b>MTW</b>  | major theater war (see MCO, MRC)          |

## N

|                  |   |
|------------------|---|
| <b>NAP</b>       | National Action Plan                            |
| <b>NASIC</b>     | U.S. National Air and Space Intelligence Center |
| <b>NATO</b>      | North Atlantic Treaty Organization              |
| <b>NAVAF</b>     | U.S. Naval Forces Africa                        |
| <b>NAVEUR</b>    | U.S. Naval Forces Europe                        |
| <b>NDAA</b>      | National Defense Authorization Act              |
| <b>NDN</b>       | Northern Distribution Network                   |
| <b>NDP</b>       | National Defense Panel                          |
| <b>NDS</b>       | National Defense Strategy                       |
| <b>New START</b> | New Strategic Arms Reduction Treaty             |
| <b>NGI</b>       | next generation interceptor                     |
| <b>NMI</b>       | NATO Mission Iraq                               |
| <b>NNSA</b>      | National Nuclear Security Administration        |
| <b>NPR</b>       | Nuclear Posture Review                          |
| <b>NPRIS</b>     | Nuclear Posture Review Implementation Study     |
| <b>NSA</b>       | National Security Agency                        |
| <b>NSBDF</b>     | National Sea-Based Deterrence Fund              |
| <b>NSC</b>       | National Security Council                       |
| <b>NSR</b>       | Northern Sea Route                              |
| <b>NSWC</b>      | Naval Special Warfare Command                   |

## O

|              |   |
|--------------|---|
| <b>OAR</b>   | Operation Atlantic Resolve                      |
| <b>OAS</b>   | Organization of American States                 |
| <b>OCO</b>   | overseas contingency operations                 |
| <b>ODNI</b>  | Office of the Director of National Intelligence |
| <b>OEF</b>   | Operation Enduring Freedom                      |
| <b>O-FRP</b> | Optimized Fleet Response Plan                   |
| <b>OIF</b>   | Operation Iraqi Freedom                         |
| <b>OMFV</b>  | optionally manned fighting vehicle              |
| <b>ONA</b>   | Office of Net Assessment                        |
| <b>ONE</b>   | Operation Noble Eagle                           |
| <b>OPCON</b> | operational control                             |

|                 |  |
|-----------------|--|
| <b>OPE-P</b>    | Operation Pacific Eagle–Philippines                  |
| <b>OPIR</b>     | Overhead Persistent Infrared                         |
| <b>OPLAN</b>    | operational plan                                     |
| <b>OPTEMPO</b>  | operational tempo                                    |
| <b>OSCE</b>     | Organization for Security and Co-operation In Europe |
| <b>OT&amp;E</b> | Operational Test and Evaluation                      |
| <b>OTFSTM</b>   | Operating Tempo Full Spectrum Training Miles         |

## P

|                |   |
|----------------|---|
| <b>PACAF</b>   | U.S. Pacific Air Forces                                       |
| <b>PACFLT</b>  | U.S. Pacific Fleet  |
| <b>PACOM</b>   | U.S. Pacific Command  |
| <b>PAF</b>     | Philippine Air Force  |
| <b>PDD-15</b>  | Presidential Decision Directive-15                            |
| <b>PFLP</b>    | Popular Front for the Liberation of Palestine                 |
| <b>PFLP-GC</b> | Popular Front for the Liberation of Palestine–General Command |
| <b>PGM</b>     | precision-guided munitions                                    |
| <b>PIM</b>     | Paladin Integrated Management                                 |
| <b>PKK</b>     | Kurdistan Workers' Party                                      |
| <b>PKO</b>     | peacekeeping operation  |
| <b>PLA</b>     | People's Liberation Army                                      |
| <b>PLAAF</b>   | People's Liberation Army Air Force                            |
| <b>PLAN</b>    | People's Liberation Army Navy                                 |
| <b>PLARF</b>   | People's Liberation Army Rocket Force                         |
| <b>PLASSF</b>  | People's Liberation Army Strategic Support Force              |
| <b>PLO</b>     | Palestine Liberation Organization                             |
| <b>PNI</b>     | Presidential Nuclear Initiative                               |
| <b>PNT</b>     | positioning, navigation, and timing                           |
| <b>PRC</b>     | People's Republic of China                                    |
| <b>PRT</b>     | Provisional Reconstruction Team                               |
| <b>PSA</b>     | Port of Singapore Authority                                   |
| <b>PSF</b>     | Peninsula Shield Force  |
| <b>PWSA</b>    | Proliferated Warfighter Space Architecture                    |

## Q

|              |  |
|--------------|--|
| <b>QDR</b>   | Quadrennial Defense Review                       |
| <b>QME</b>   | qualitative military effectiveness               |
| <b>QNSTR</b> | Quadrennial National Security Threats and Trends |

# R

|                  |   |
|------------------|---|
| <b>RAF</b>       | Royal Air Force                                       |
| <b>RAP</b>       | readiness action plan                                 |
| <b>RBA</b>       | Ready Basic Aircraft                                  |
| <b>RCOH</b>      | refueling and complex overhaul (nuclear-powered ship) |
| <b>RDJTF</b>     | Rapid Deployment Joint Task Force                     |
| <b>RDT&amp;E</b> | Research, Development, Test, and Evaluation           |
| <b>RFP</b>       | Request for Proposals                                 |
| <b>RIMPAC</b>    | Rim of the Pacific                                    |
| <b>RKV</b>       | redesigned kill vehicle                               |
| <b>RMA</b>       | revolution in military affairs                        |
| <b>ROK</b>       | Republic of Korea (South Korea)                       |
| <b>RP</b>        | Republic of the Philippines                           |
| <b>RPG</b>       | rocket-propelled grenade                              |

# S

|                  |   |
|------------------|---|
| <b>SAARC</b>     | South Asia Association of Regional Cooperation      |
| <b>SAC</b>       | strategic airlift capability                        |
| <b>SACEUR</b>    | Supreme Allied Commander Europe                     |
| <b>SAM</b>       | surface-to-air missile                              |
| <b>SAR</b>       | search and rescue                                   |
| <b>SBCT</b>      | Stryker Brigade Combat Team                         |
| <b>SBIRS</b>     | Space-Based Infrared System (satellite system)      |
| <b>SBSS</b>      | Space-Based Surveillance System                     |
| <b>SCN</b>       | Shipbuilding and Conversion, Navy (budget category) |
| <b>SEAL</b>      | Sea Air Land operator (Navy)                        |
| <b>SEATO</b>     | Southeast Asia Treaty Organization                  |
| <b>SFA</b>       | Strategic Framework Agreement                       |
| <b>SFAB</b>      | Security Force Assistance Brigades                  |
| <b>SIGINT</b>    | signals intelligence                                |
| <b>SIPRI</b>     | Stockholm International Peace Research Institute    |
| <b>SLBM</b>      | submarine-launched ballistic missile                |
| <b>SMU</b>       | special mission unit                                |
| <b>SOCAFRICA</b> | U.S. Special Operations Command Africa              |
| <b>SOCENT</b>    | U.S. Special Operations Command Central             |
| <b>SOCEUR</b>    | U.S. Special Operations Command Europe              |
| <b>SOC PAC</b>   | U.S. Special Operations Command Pacific             |
| <b>SOF</b>       | U.S. Special Operations Forces                      |
| <b>SOP</b>       | standard operating procedure                        |
| <b>SORT</b>      | Strategic Offensive Reductions Treaty               |
| <b>SOTFE</b>     | Support Operations Task Force Europe                |



|                 |  |
|-----------------|--|
| <b>SPE</b>      | Sony Pictures Entertainment                  |
| <b>SPMAGTF</b>  | Special-Purpose Marine Air-Ground Task Force |
| <b>SpOC</b>     | Space Operations Command                     |
| <b>SRBM</b>     | short-range ballistic missile                |
| <b>SRM</b>      | Sustainable Readiness Model                  |
| <b>SSBN</b>     | ballistic missile submarine, nuclear-powered |
| <b>SSGN</b>     | guided missile submarine, nuclear-powered    |
| <b>SSN</b>      | attack submarine, nuclear-powered            |
| <b>SSP</b>      | Stockpile Stewardship Program                |
| <b>STA-1</b>    | Strategic Trade Authorization-1              |
| <b>STARCOM</b>  | U.S. Space Training and Readiness Command    |
| <b>STRATCOM</b> | U.S. Strategic Command                       |
| <b>SUW</b>      | surface warfare                              |

## T

|                 |                                      |
|-----------------|--------------------------------------|
| <b>TACAIR</b>   | tactical air                         |
| <b>TAFWN</b>    | The Air Force We Need                |
| <b>TAI</b>      | total active inventory               |
| <b>TANAP</b>    | Trans-Anatolian Natural Gas Pipeline |
| <b>TAP</b>      | Trans-Adriatic Pipeline              |
| <b>TCO</b>      | transnational criminal organization  |
| <b>TDY</b>      | stateside temporary duty             |
| <b>THAAD</b>    | Terminal High Altitude Area Defense  |
| <b>TLAM/N</b>   | Tomahawk Land Attack Missile/Nuclear |
| <b>TMP</b>      | technical modernization program      |
| <b>TNW</b>      | tactical nuclear weapon              |
| <b>TPP</b>      | Trans-Pacific Partnership            |
| <b>TRA</b>      | Taiwan Relations Act                 |
| <b>TRANSCOM</b> | U.S. Transportation Command          |
| <b>TSOC</b>     | Theater Special Operations Command   |
| <b>TTP</b>      | Tehrik-e-Taliban Pakistan            |

## U

|               |   |
|---------------|---|
| <b>UAE</b>    | United Arab Emirates  |
| <b>UAV</b>    | unmanned aerial vehicle   |
| <b>UCLASS</b> | Unmanned Carrier-Launched Airborne Surveillance and Strike        |
| <b>UCP</b>    | Unified Command Plan  |
| <b>U.K.</b>   | United Kingdom  |
| <b>ULA</b>    | United Launch Alliance  |
| <b>UNASUR</b> | Unión de Naciones Suramericanas (Union of South American Nations) |
| <b>UNC</b>    | United Nations Council  |

|                   |   |
|-------------------|---|
| <b>UNCLOS</b>     | U.N. Convention on the Law of the Sea   |
| <b>UNIFIL</b>     | United Nations Interim Force in Lebanon |
| <b>USAF</b>       | U.S. Air Force                          |
| <b>USAFCENT</b>   | U.S. Air Forces Central                 |
| <b>USAFE</b>      | U.S. Air Forces Europe                  |
| <b>USARAF</b>     | U.S. Army Africa                        |
| <b>USARCENT</b>   | U.S. Army Central                       |
| <b>USAREUR</b>    | U.S. Army Europe                        |
| <b>USARPAC</b>    | U.S. Army Pacific                       |
| <b>USASOC</b>     | U.S. Army Special Operations Command    |
| <b>USCYBERCOM</b> | U.S. Cyber Command                      |
| <b>USFJ</b>       | U.S. Forces Japan                       |
| <b>USFK</b>       | U.S. Forces Korea                       |
| <b>USMC</b>       | U.S. Marine Corps                       |
| <b>USNAVCENT</b>  | U.S. Naval Forces Central               |
| <b>USNORTHCOM</b> | U.S. Northern Command                   |
| <b>USSF</b>       | U.S. Space Force                        |
| <b>USSOCOM</b>    | U.S. Special Operations Command         |
| <b>USSOUTHCOM</b> | U.S. Southern Command                   |
| <b>USSPACECOM</b> | U.S. Space Command                      |
| <b>USV</b>        | unmanned surface vessel                 |
| <b>USW</b>        | undersea warfare                        |

## V

|            |  |
|------------|--|
| <b>VEO</b> | violent extremist organizations            |
| <b>VFA</b> | U.S.-Philippines Visiting Forces Agreement |
| <b>VLS</b> | vertical launching system                  |
| <b>VPM</b> | Virginia Payload Module                    |

## W

|             |   |
|-------------|---|
| <b>WGS</b>  | Wideband Global SATCOM (satellite system) |
| <b>WMD</b>  | weapons of mass destruction               |
| <b>WRM</b>  | wartime readiness materials               |
| <b>WWTA</b> | Worldwide Threat Assessment               |

## Methodology

The assessment portion of the *Index of U.S. Military Strength* is composed of three major sections that address America’s military power, the operating environments within or through which that power must be employed, and threats to America’s vital national interests.

The authors of this study used a five-category scoring system that ranged from “very poor” to “excellent” or “very weak” to “very strong” as appropriate to each topic. They chose this approach because it captures meaningful gradations while avoiding the appearance that a high level of precision is possible given the nature of the issues and the information that was publicly available.

Some factors are quantitative and lend themselves to discrete measurement; others are qualitative in nature and can be assessed only through an informed understanding of the material that leads to a judgment call. Further, because conditions in each of the areas assessed are changing throughout the year, any measurement must necessarily be based on the information at hand and viewed as a snapshot in time. We understand that this is not entirely satisfactory when it comes to reaching conclusions on the status of a given matter (especially the adequacy of military power) and will be unsatisfactory for some readers, but we also understand that senior officials in decision-making positions will never have a comprehensive set of inarguable hard data on which to base a decision.

Purely quantitative measures alone tell only part of the story when it comes to the relevance, utility, and effectiveness of hard power. In fact, using only quantitative metrics to assess military power or the nature of an operating environment can lead to misinformed conclusions. Raw numbers are a very important component, but they tell only a part of the story of war. Similarly, experience and demonstrated proficiency are often

decisive factors in war, but they are also nearly impossible to measure.

The assessment of the *global operating environment* in this *Index* focuses on three key regions—Europe, the Middle East, and Asia—because of their importance relative to U.S. vital economic, diplomatic, and security interests.

For *threats to U.S. vital interests*, the *Index* identifies the countries that pose the greatest current or potential threats to U.S. vital interests based on two overarching factors: behavior and capability. The classic definition of “threat” considers the combination of intent and capability, but intent cannot be clearly measured. Therefore, observed behavior (including historical behavior and explicit policies or formal statements vis-à-vis U.S. interests) is used as a reasonable surrogate because it is the clearest manifestation of intent. The countries selected according to these criteria are scored in two areas:

- The degree of provocative behavior that they exhibited during the year.
- Their ability to pose a credible threat to U.S. interests irrespective of intent.

Finally, the *status of U.S. military power* is addressed in three areas: capability (or modernity), capacity, and readiness. All three are fundamental to success even if they are not de facto determinants of success (something we explain further in the section). Also addressed is the condition of America’s nuclear weapons capability, which is assessed in areas that are unique to this military component and critical to understanding its real-world viability and effectiveness as a strategic deterrent. Though they are not scored according to the stated metrics, the chapter on military power includes explanatory overviews of U.S. missile defense and cyber.

## Assessing the Global Operating Environment

Not all of the factors that characterize an operating environment are equal, but each contributes to the degree to which a particular operating environment is favorable or unfavorable to future U.S. military operations. In assessing the operating environment, four regional characteristics that are of greatest relevance to the conduct of military operations were considered, and we used a five-point scale that ranges from “very poor” to “excellent” conditions to describe our assessment of the aggregate condition for each region.

The key regional characteristics consisted of:

- a. **Alliances.** Alliances are important for interoperability and collective defense because allies are more likely than non-allies to lend support to U.S. military operations. Indicators that provide insight into the strength or health of an alliance include whether the U.S. trains regularly with countries in the region, has good interoperability with an ally’s forces, and shares intelligence with nations in the region.
- b. **Political Stability.** Political stability brings predictability when military planners are considering such things as transit, basing, and overflight rights for U.S. military operations. The overall degree of political stability indicates whether U.S. military actions would be hindered or enabled and reflects, for example, whether transfers of power are generally peaceful and whether there have been any recent instances of political instability in the region.
- c. **U.S. Military Positioning.** Having military forces based or equipment and supplies staged in a region greatly facilitates the ability of the United States to respond to crises and presumably achieve success in critical “first battles” more quickly. Being routinely present in a region also helps the U.S. to maintain familiarity with its characteristics and the various actors that might try to assist or thwart U.S. actions. With this in mind, we assessed whether or not the U.S. military was well-positioned in the region. Again, indicators included bases, troop presence, prepositioned equipment, and recent examples of military operations (including training and humanitarian operations) launched from the region.

d. **Infrastructure.** Modern, reliable, and suitable infrastructure is essential to military operations. Airfields, ports, rail lines, canals, and paved roads enable the U.S. to stage, launch operations from, and logistically sustain combat operations. We combined expert knowledge of regions with publicly available information on critical infrastructure to arrive at our overall assessment of this metric.

The assessment scale included:

1. **Very Poor.** Significant hurdles exist for military operations. Physical infrastructure is insufficient or nonexistent, and the region is politically unstable. The U.S. military is poorly placed or absent, and alliances are nonexistent or diffuse.
2. **Unfavorable.** A challenging operating environment for military operations is marked by inadequate infrastructure, weak alliances, and recurring political instability. The U.S. military is inadequately placed in the region.
3. **Moderate.** A neutral to moderately favorable operating environment is characterized by adequate infrastructure, a moderate alliance structure, and acceptable levels of regional political stability. The U.S. military is adequately placed.
4. **Favorable.** A favorable operating environment includes good infrastructure, strong alliances, and a stable political environment. The U.S. military is well placed for future operations.
5. **Excellent.** An extremely favorable operating environment includes well-established and well-maintained infrastructure; strong, capable allies; and a stable political environment. The U.S. military is exceptionally well placed to defend U.S. interests.

## Assessing Threats to U.S. Vital Interests

To make the threats identified in this *Index* measurable and relatable to the challenges of operating environments and the adequacy of American military power, *Index* staff and outside reviewers, working independently, evaluated the threats according to their level of provocation (observed

behavior) and their actual capability to pose a credible threat to U.S. interests on a scale of 1 to 5 with 1 representing a very high threat capability or level of belligerency. This scale corresponds to the tone of the five-point scales used to score the operating environment and military capabilities in that 1 is bad for U.S. interests and 5 is very favorable.

Based on these evaluations, provocative behavior was characterized according to five descending categories: benign (5); assertive (4); testing (3); aggressive (2); and hostile (1). Staff also characterized a threat actor's capabilities according to five categories: marginal (5); aspirational (4); capable (3); gathering (2); and formidable (1). Those characterizations—behavior and capability—form the two halves of the overall threat level.

### Assessing U.S. Military Power

Also assessed is the adequacy of the U.S. defense posture as it pertains to a conventional understanding of hard power, defined as the ability of American military forces to engage and defeat an enemy's forces in battle at a scale commensurate with America's vital national interests. The assessment draws on both quantitative and qualitative aspects of military forces, informed by an experience-based understanding of military operations and the expertise of the authors and internal and external reviewers.

It is important to note that military effectiveness is as much an art as it is a science. Specific military capabilities represented in weapons, platforms, and military units can be used individually to some effect. Practitioners of war, however, have learned that combining the tools of war in various ways and orchestrating their tactical employment in series or simultaneously can dramatically amplify the effectiveness of the force committed to battle.

The point is that the ability of a military force to locate, close with, and destroy an enemy depends on many factors, but relatively few of them are easily measured. The scope of this specific project does not extend to analysis of everything that makes hard power possible; it focuses on the status of the hard power itself.

This *Index* assesses the state of military affairs for U.S. forces in three areas: capability, capacity, and readiness.

**Capability.** Scoring of capability is based on the current state of combat equipment. This involves four factors:

- The ages of key platforms relative to their expected life spans.
- Whether the required capability is being met by legacy or modern equipment.
- The scope of improvement or replacement programs relative to the operational requirement.
- The overall health and stability (financial and technological) of modernization programs.

This *Index* focused on primary combat units and such combat platforms as tanks, ships, and airplanes and elected not to include the array of system and component upgrades such as a new radar, missile, or communications suite that keep an older platform viable over time. New technologies grafted onto aging platforms ensure that U.S. military forces keep pace with technological innovations that are relevant to the modern battlefield, but at some point, the platforms themselves are no longer viable and must be replaced. Modernized sub-systems and components do not entirely substitute for aging platforms, and it is the platforms themselves that are usually the more challenging items to field. In this sense, primary combat platforms serve as representative measures of force modernity just as combat forces are a useful surrogate measure for the overall military that includes a range of support units, systems, and infrastructure.

In addition, it is assumed that modernization programs should replace current capacity at a one-to-one ratio. Less than a one-to-one replacement assumes risk, because even if the newer system is presumably better than the older, until it is proven in actual combat, having fewer systems lessens the force's capacity—an important factor if combat against a peer competitor carries with it the likelihood of attrition. For modernization programs, only Major Defense Acquisition Programs (MDAPs) are scored.

The capability score uses a five-grade scale. Each service receives one capability score that is a non-weighted aggregate of scores for four categories: (1) Age of Equipment, (2) Modernity of Capability, (3) Size of Modernization Program, and (4) Health of Modernization Program. General criteria for the capability categories are:

### Age of Equipment

- **Very Weak:** Equipment age is past 80 percent of expected life span.
- **Weak:** Equipment age is 61 percent–80 percent of expected life span.
- **Marginal:** Equipment age is 41 percent–60 percent of expected life span.
- **Strong:** Equipment age is 21 percent–40 percent of expected life span.
- **Very Strong:** Equipment age is 20 percent or less of expected life span.

### Capability of Equipment

- **Very Weak:** More than 80 percent of capability relies on legacy platforms.
- **Weak:** 60 percent–79 percent of capability relies on legacy platforms.
- **Marginal:** 40 percent–59 percent of capability is made up of legacy platforms.
- **Strong:** 20 percent–39 percent of capability is made up of legacy platforms.
- **Very Strong:** Less than 20 percent of capability is made up of legacy platforms.

### Size of Modernization Program

- **Very Weak:** Modernization program is significantly too small or inappropriate to sustain current capability or program in place.
- **Weak:** Modernization program is smaller than current capability size.
- **Marginal:** Modernization program is appropriate to sustain current capability size.
- **Strong:** Modernization program will increase current capability size.
- **Very Strong:** Modernization program will vastly expand capability size.

### Health of Modernization Program

- **Very Weak:** Modernization program faces significant problems; too far behind schedule (five-plus years); cannot replace current capability before retirement; lacks sufficient investment to advance; cost overruns include Nunn–McCurdy breach, which occurs when the cost of a new item exceeds the most recently approved amount by 25 percent or more or if it exceeds the originally approved amount by 50 percent or more.<sup>1</sup>
- **Weak:** Modernization program faces procurement problems; behind schedule (three–five years); difficulty replacing current equipment on time or insufficient funding; cost overruns enough to trigger an Acquisition Program Baseline (APB) breach.<sup>2</sup>
- **Marginal:** Modernization program faces few problems; one–two years behind schedule but can replace equipment with some delay or experience some funding cuts; some cost growth but not within objectives.
- **Strong:** Modernization program faces no procurement problems; can replace equipment with no delays; within cost estimates.
- **Very Strong:** Modernization program is performing better than DOD plans, including with lower actual costs.

**Capacity.** To score capacity, the Army, Navy, and Air Force (be it end strength or number of platforms) are compared to the force size required to meet a simultaneous or nearly simultaneous two-war or two–major regional contingency (MRC) benchmark. This benchmark consists of the force needed to fight and win two MRCs and a 20 percent margin that serves as a strategic reserve. The Marine Corps is handled a bit differently (see the explanatory note below and a more expanded discussion within its specific assessment).<sup>3</sup> A strategic reserve is necessary because deployment of 100 percent of the force at any one time is highly unlikely. Not only do ongoing requirements like training or sustainment and maintenance of equipment make it infeasible for the entirety of the force to be available for deployment, but committing 100 percent

of the force would leave no resources available to handle unexpected situations.

Thus, a “marginal” capacity score would exactly meet a two-MRC force size, a “strong” capacity score would equate to a plus-10 percent margin for strategic reserve, and a “very strong” score would equate to a 20 percent margin.

### Capacity Score Definitions

- **Very Weak:** 0 percent–37 percent of the two-MRC benchmark.
- **Weak:** 38 percent–74 percent of the two-MRC benchmark.
- **Marginal:** 75 percent–82 percent of the two-MRC benchmark.
- **Strong:** 83 percent–91 percent of the two-MRC benchmark.
- **Very Strong:** 92 percent–100 percent of the two-MRC benchmark.

**Readiness.** The readiness scores are derived from the military services’ own assessments of readiness based on their requirements. For many reasons—not least of which is concern about informing a potential enemy’s calculations on sensitive, detailed aspects of a force’s readiness for combat—the services typically classify their internal readiness reporting. However, they do make some public reports, usually when providing open testimony to Congress. Thus, instead of delving into comprehensive reviews of all readiness input factors, the *Index* relies on the public statements of the military services regarding the state of their readiness, caveated to an extent by the accumulated personal experience of the authors and noted as such in the text when appropriate.

It should be noted that even a “strong” or “very strong” score does not necessarily indicate that 100 percent of the force is ready; it indicates only that the service is meeting 100 percent of its own

readiness requirements. Often, these requirements assume that a percentage of the military at any one time will not be fit for deployment. Thus, even if readiness is graded as “strong” or “marginal,” there is still a gap in readiness that will have significant implications for immediate combat effectiveness and the ability to deploy quickly. Anything short of meeting 100 percent of readiness requirements therefore assumes risk and is problematic.

In addition, a service’s assessment of its readiness occurs within its size or capacity at that time and as dictated by the Defense Strategic Guidance, National Military Strategy, and related top-level documents generated by the Administration and senior Defense officials. It does not account for the size-related “readiness” of the force to meet national security requirements, which is assessed as needed by this *Index*. Consequently, for a service to be assessed as “very strong” would mean that 80 percent–100 percent of its existing force meets its requirements for being “ready” even if its size is less than the size required to meet the two-MRC benchmark. It is important that the reader keep this in mind when considering the actual readiness of the force to protect U.S. national security interests against the challenges presented by threats around the world.

### Readiness Score Definitions

- **Very Weak:** 0 percent–19 percent of service’s requirements.
- **Weak:** 20 percent–39 percent of service’s requirements.
- **Marginal:** 40 percent–59 percent of service’s requirements.
- **Strong:** 60 percent–79 percent of service’s requirements.
- **Very Strong:** 80 percent–100 percent of service’s requirements.

## Endnotes

1. 10 U.S. Code Ch. 325: Cost Growth–Unit Cost Reports (Nunn–McCurdy), § 4371(a)(3)(A)(1) and (B)(1), <https://uscode.house.gov/view.xhtml?req=granuleid%3AUSC-prelim-title10-chapter325&edition=prelim> (accessed August 9, 2023).
2. 14 U.S. Code § 1135: Acquisition Program Baseline Breach, <https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title14-section1135&num=0&edition=prelim> (accessed August 9, 2023).
3. As noted in the introduction to the chapter assessing military power, the three large services (Army, Navy, and Air Force) are sized for global action in more than one theater at a time. The Marines, by virtue of overall size and most recently by direction of the Commandant, focus on one major conflict while ensuring that all Fleet Marine Forces are globally deployable for short-notice, smaller-scale actions. Having assessed that the Indo-Pacific region will continue to be of central importance to the U.S. and noting that China is a more worrisome “pacing threat” than any other competitor and that the Joint Force lacks the ability to operate within the range of intensely weaponized, layered defenses featuring large numbers of precision-guided munitions, the Corps is reshaping itself to optimize its capabilities and organizational structures to meet this challenge. This *Index* concurs with this effort but assesses that the Corps will still need greater capacity to succeed in war in the very circumstances for which the Marines believe they must prepare. Consequently, we assess the Marine Corps’ capacity against a one-war metric.





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