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Spending Towards Strategy: Restructuring the U.S. Navy to Support Offshore Balancing

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EXECUTIVE SUMMARY

America is entering a period where greater economic constraints will force overdue reevaluations of its grand strategy and security priorities. As our nation contends with the impacts of the COVID-19 pandemic, the credibility of our current commitments abroad are increasingly under strain. America's grand strategy should reflect these limitations on U.S. capabilities by shifting to an offshore balancing approach, which calls upon regional allies to act as the first lines of defense in maintaining their local balances of power, while offering support as a last resort if needed.

Our current grand strategy of deep engagement has involved waging multiple open-ended wars at once and maintaining a widespread network of permanent forward bases. Offshore balancing offers a more fiscally sustainable posture that still protects vital interests. To ensure that America can continue to credibly deter, and if need be, defeat its adversaries through offshore balancing, the right defense investments are critical. The most important service branch to properly invest in to meet these strategic needs is the U.S. Navy.

Three Naval spending priorities stand out. By expanding its sealift capacity and modernizing its shipyard operations, the Navy can credibly demonstrate the United States' ability to rapidly deploy overwhelming force against aggressors without having to rely on a multitude of expensive, vulnerable, and politically contentious forward bases. Finally, by orienting its fleet structure to achieve dispersible mass, strike range, and survivability in a fiscally sustainable manner, the U.S. Navy can also reduce its vulnerability to anti-access/area denial (A2/AD) networks, which are likely to feature heavily in any future near-peer conflict. These fleet structure changes will also improve the Navy's ability to contribute to A2/AD capabilities of regional allies to deter would-be aggressors.

Learning to Live with Constraints

Focusing On Core U.S. Interests

A decade ago, Admiral Mike Mullen, then-Chairman of the Joint Chiefs of Staff, identified the national debt as “the most significant threat to our national security.” “The ability for our country to resource our military,” Mullen said, “is going to be directly proportional – over time ... to the health of our economy.”¹ At a time when America’s national debt is increasing to unprecedented levels as it responds to the COVID-19 pandemic and a contracting economy, Mullen’s words are more relevant than ever in thinking about our defense investments.²

At the end of the 2010 fiscal year, shortly after Mullen’s remarks, the national debt was \$13.5 trillion.³ Since then, the figure has doubled. Our debt now exceeds an estimated \$27.5 trillion as of December 2020.⁴ Compared to the size of the U.S. economy, America’s national debt is roughly 135%⁵ of GDP, a figure surpassing all but four OECD countries.⁶ This figure, a worrying indicator for any country, brings our ability to sustain current spending, let alone a strong national defense, into doubt.

U.S. debt projections suggests this fiscal state of affairs will only worsen. The Congressional Budget Office projects that debt held by the public will reach its highest ever as early as 2023, exceeding its 1945 peak.⁷ By 2041, the CBO estimates that interest payments on the national debt, along with “mandatory” spending on entitlements like health care and social security, will surpass national revenue before the defense budget is even added. And by 2050, the CBO estimates the percentage of debt held by the public to GDP could reach nearly 200% percent of GDP.⁸

These fiscal burdens are exacerbated by disastrous U.S. foreign policy choices and carry concrete costs for U.S. citizens. In 2011, the Cost of War Project at Brown University calculated that higher spending from the War on Terror between 2001 and 2010 increased U.S. public debt by \$4,000 per person, likely raising interest rates by 35 basis points (or 0.35%) higher than otherwise.⁹ These higher interest rates in

turn increased median annual American mortgage payments by over \$600 annually--the average size of every American’s 2001 and proposed COVID-19 relief stimulus checks.¹⁰

Despite the limits of American resources becoming increasingly apparent, U.S. defense spending has not adjusted to economic realities. Despite facing considerably reduced comparative threats after 1991, the United States has surpassed its peak Cold War era spending every year since 2005.¹¹ 2020’s \$738 billion authorized defense budget was America’s highest ever, outpacing the defense spending of the next ten countries combined.¹²

Sooner or later, these economic indicators suggest that U.S. ambitions abroad will face a reckoning with its fiscal realities at home. If the United States can manage this transition to a sustainable footing proactively, it can shed superfluous ambitions in favor of protecting its core interests more safely and with fewer costs to its global influence. Fortunately, one analysis of historical cases of European and Asian great powers experiencing relative decline between 1870 and 1989 suggests that retrenchment frequently resulted in the declining power managing to safely halt or reverse their relative decline without war.¹³ Waiting until rising interest payments on the national debt force the U.S. to involuntarily retrench is a far riskier proposition for protecting American interests longer-term.

Challenging Strategic Assumptions

Barry Posen defines grand strategy as “a nation-state’s theory about how to produce security for itself,” a framework which “prioritizes threats and potential political and military remedies to threats.”¹⁴ Grand strategy, Posen argues, “focuses on military threats, because these are the most dangerous, and military remedies because these are the most costly.”¹⁵

Based on its limited number of major military threats, the United States has a narrow set of vital national interests crucial to keeping it safe, which should inform its grand strategic decisions.

Beyond protecting the American homeland and its citizens, a core U.S. interest is preventing the rise

of regional hegemons in Eurasia or the Middle East, which could viably challenge the U.S. military or restrict global energy supplies, respectively.¹⁶ A second major interest is protecting the openness of the global commons, which benefits American air, naval, and space advantages and buttresses the prosperity that fuels U.S. military and commercial strength.¹⁷

However, since the end of the Cold War, the U.S. has failed to focus its military resources on securing these vital interests. By pursuing a grand strategy of deep engagement, the U.S. has attempted to reinforce its international hegemony through a substantial program of forward basing. The United States has also attempted to maintain unparalleled offensive capabilities against any state, with insufficient regard for cost and threat prioritization, while frequently resorting to the use of force against adversaries when vital interests are not implicated.

Unfortunately, the United States' prevailing strategy has frequently proven counterproductive. America's network of foreign bases and outposts, as high as 800 in over 70 countries according to one liberal estimate, costs it between \$60 and \$120 billion annually.¹⁸ Such networks also add the political liability of often contributing to or exacerbating regional disputes instead of averting them.¹⁹ Additionally, the ongoing conflicts in Afghanistan, Iraq, and elsewhere in the aftermath of 9/11 have cost the United States the lives of more than 7,000 service members²⁰ and 6.4 trillion dollars²¹ while incurring significant diplomatic costs and miring it in nation-building operations it is ill-suited to achieve. Most importantly long-term, these commitments sap American strength and distract the United States from focusing on peacefully deterring great powers that could more realistically one day threaten U.S. vital interests.

An alternative grand strategic framework, offshore balancing, would better equip America to protect its security while husbanding its power longer-term for use in more strategically important major contingencies. Under offshore balancing, the United States would transfer responsibility to its regional partners for being the first lines of their own defense.



ARABIAN SEA (Nov. 17, 2020) The aircraft carrier USS Nimitz (CVN 68) steams ahead of the cruiser USS Princeton (CG 59) while participating in Malabar 2020 in the north Arabian Sea. (U.S. Navy photo by Mass Communication Specialist 3rd Class Elliot Schaudt) 2011 N-NH2571123. No changes were made to this photo.

By encouraging higher readiness among U.S. security partners, this transition would also better support those nations' interests over the long-run. Should adversaries threaten to upset regional balances of power beyond partners' ability to contain them, the United States would intervene if necessary to support its partners, check adversaries, and prevent the rise of hegemons.²²

Naval Priorities Under Offshore Balancing

The most important armed force for successfully implementing an offshore balancing approach is the United States Navy. This branch is already central to preserving America's access to and command of the global commons, which in turn aids in regional balancing by dually supporting American economic and military strength.

In addition to the free flow of trade that supports the economies of the U.S. and its allies, fueling their collective military strength, command of the commons confers several strategic benefits. By enjoying significantly more military use of the sea than other powers thanks to its naval superiority, the United States is able to better exploit the advantages of its economy and geographical location, buying itself more time to amass and strengthen its forces. Superiority in the commons also allows the United States

to more easily assist remote allies and project power against aggressive foes while denying them access to the commons for their own force projection.²³ Maintaining naval readiness therefore is fundamental to a sustainable and effective defense of core U.S. interests.

Tailoring naval spending to most effectively support these national interests increases the likelihood that the United States can safely transition to offshore balancing—a strategy, unlike deep engagement, that it can credibly maintain long-term. Investing in an effective force structure to accomplish this goal will give the United States the best opportunity to continue to reassure partners. Effective naval defense investments are also most likely to restrain would-be adversaries from attempting to impose *fait accompli* scenarios by successfully up-ending regional power balances and consolidating gains before the U.S. and its allies can fully react.

In order to effectively defend the commons and support regional balancing, the Navy should pursue three goals to achieve maximum impact with its limited resources: modernizing shipyard operations, expanding surge sealift capacity, and better orienting fleet structure to continue to sustainably deter and if necessary thwart the most formidable potential regional threat—a Chinese attack in the Western Pacific.

The United States should address these force priorities without exacerbating the fiscal problems discussed previously. The smartest way for America to finance its naval needs is to take the strategically wise steps of ending military engagement in open-ended conflicts in Afghanistan and Iraq that no longer serve the vital U.S. interests outlined above.

Shipyard Modernization

Why the Navy Needs Shipyards

In order to sustain itself in a major conflict supporting regional partners in a distant theater, the United States needs to maintain the capability to efficiently replace Naval losses through repair and construction. Unfortunately, the Navy's ability to maintain itself even in peacetime is increasingly in doubt. This shortcoming undermines U.S. regional deterrents by lower-

ing the costs of aggressive action for adversaries with the right investments to counter U.S. naval force structure. Beyond combat repairs and new ship construction, ensuring that a sufficient percentage of the fleet is available at any given time is essential to providing an effective deterrent.

Each ship class in the Navy has a series of scheduled maintenance periods throughout its projected service life that shipyards have to plan for. Maintenance period durations vary widely. More routine periodic repairs can last a few months, while much longer maintenance, such as the midlife Refueling and Complex Overhauls for Nimitz-class carriers, last over 44 months.²⁴ In order to meet the needs of the fleet and keep ships deployable, the Navy's shipyards need to have the capacity and efficiency to complete planned maintenance on time. Unfortunately, as the number of public Navy shipyards has reduced overtime, these maintenance goals have become harder to meet.

Public Shipyard Capacity

For most of U.S. history, with some variation, the Navy maintained 8 public shipyards, but this number has declined in recent decades. As the Cold War came to an end, Congress looked to cut excess capacity as it drew down forces through five rounds of Base Realignment and Closure (BRAC). Between 1991 and 1995, the number of public shipyards fell to four, where it remains to this day. Of these four public shipyards, two are on the East Coast (Portsmouth Naval Shipyard in Maine and Norfolk Naval Shipyard in Virginia), and two are on the West Coast (Puget Sound Naval Shipyard and Intermediate Maintenance Facility in Washington State, and Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility in Hawaii). Drydocks, where ships are housed during maintenance to allow repair access, are the best proxy for shipyard capacity. The U.S. currently has 18 public drydocks, with 6 on the West Coast and 8 on the East Coast.

While the Navy relies on 22 private shipyards for construction and the maintenance of its conventionally propelled fleet, the four public shipyards have the primary responsibility for maintaining the 80-vessel nuclear fleet of aircraft carriers and submarines. In

addition to this default tasking, certain public shipyard facilities are the only kind that can service aircraft carriers. With their limited capacity but important functions, public shipyards represent a crucial maintenance bottleneck for the U.S. Navy.

Degrading Facilities, Declining Readiness

Unfortunately for the United States's Naval deterrence capacity, its public shipyards are in crisis. Each facility is over 100 years old, and the Norfolk shipyard dates back to 1767, before the founding of the United States itself.²⁵ Each public shipyard has experienced piecemeal construction and is oriented inefficiently to accommodate construction methods of bygone eras.²⁶

Additionally, Naval shipyard facilities are in chronic disrepair. The Navy's own condition ratings of its shipyards' facilities are incredibly poor, with an average score of 66 out of 100, well below the minimum target standard of 80.²⁷ Further, Naval shipyard capital equipment, crucial for actually performing maintenance, such as cranes, furnaces, and machine tools, is on average more than double or triple the age of comparable equipment in private shipyards.²⁸

These factors help explain declining trends in readiness. The Government Accountability Office found that between 2015 and 2019, public shipyards completed only 38 of 51 (or 75 percent) of planned maintenance periods for aircraft carriers and submarines on time.²⁹ Overall, this cost the Navy's most expensive and potent nuclear assets a shocking combined 7,424 days of maintenance delays where these vessels were unavailable for planned deployment.³⁰ For carriers, the average delay was 113 days.³¹ For the more survivable and strategically important submarine fleet, the disparity was even worse, with an average delay of 225 days.³² Among other issues, the GAO found that the lack of preparation for unplanned maintenance (i.e. additional problems found during planned maintenance periods) contributed to over a third of this lost time.³³ The GAO noted that the Navy suffers from a lack of skilled personnel to perform crucial functions, and that it has to consistently rely on overtime work, between a quarter and a third of the time.³⁴ These trends are un-

sustainable even during peace time, and they would leave the Navy critically vulnerable during any major potential peer conflict.

If public shipyards cannot even meet current planned maintenance requirements, their capacity will be strained even further as the Navy grows from its roughly 300 ships today to the 355 required by the 2018 National Defense Authorization Act.³⁵ If 10 of those new ships are part of the nuclear fleet, as called for in the Navy's 2016 force structure assessment, the Navy calculates that it lacks the capacity to perform over 68 of the scheduled maintenance periods required to support its nuclear vessels through 2040.³⁶

Revitalizing Shipyard Infrastructure

Fortunately, the Navy is taking action to address its shipyard deficiencies. In January 2020, Chief of Naval Operations Admiral Michael Gilday set an aggressive goal of zero maintenance days lost by the end of Fiscal Year 2021.³⁷ Naval Sea Systems Command, which oversees shipyard maintenance, has already made progress reducing lost maintenance days to 1,100 in FY 2020 by implementing the Shipyard Performance to Plan Initiative, released in 2018.³⁸ The plan featured a comprehensive data analysis that allowed for better planning of likely maintenance needs, more realistic scheduling, and longer lead-times for private shipyard contract awarding to facilitate more proactive maintenance plans.³⁹ Whether this progress can be maintained remains in doubt, however. The GAO notes that the Navy has yet to develop capacity to collect 13 of 25 planned metrics that could improve its understanding of maintenance delay causes.⁴⁰

For longer-term reform, the Navy released a 20-year, \$21 billion shipyard modernization blueprint in early 2018. The Shipyard Infrastructure Optimization Plan (SIOP) outlines each public shipyard's deficiencies and proposes a reconstruction plan for each facility. Informed by digital modeling of workflow patterns at each shipyard, the SIOP would reconfigure each facility. The modeling data would guide redesigns around the most efficient layout for each equipment, replace aging equipment, and would renovate eight of the 18 public drydocks. The Navy expects fully fund-

ing the SIOP to improve the efficiency of existing public drydock enough to enable it to recover 67 of the 68 planned maintenance stays it cannot currently support for 10 additional nuclear vessels through 2040.⁴¹

Frustratingly, the GAO notes that the SIOP cost estimates suffer from lack of some basic due diligence, like accounting for inflation and documenting estimates that could lead to variations of billions in the final total. Fortunately, the SIOP's digital modeling is scheduled for completion this year and should facilitate more accurate cost estimates moving forward.

While a considerable investment, fully funding the SIOP for the next two decades should be a high priority for Naval spending given the outsized impact it will have on the United States' ability to project force and deter regional aggressors. The U.S. cannot afford to be handicapped with a smaller-than-expected force to react to a near-peer competitor on short notice due to deficiencies it has time to correct while in peacetime.

Additionally, the Navy should consider expanding its use of private shipyards for submarine maintenance, particularly when public shipyards lack capacity. Private shipyards have handled roughly a quarter of planned submarine maintenance periods between 1993 and 2017.⁴² The Congressional Budget Office found that while costs are becoming more even overtime, repairs at private shipyards were on average 31% less expensive across this 26 year period.⁴³ After high profile incidents like the U.S.S. Boise's 5 year wait before it could begin its planned 2013 maintenance period, the flexibility to transfer maintenance to private shipyards when necessary is crucial.⁴⁴

Summary of Key Solutions

- Fund and streamline the SIOP process to improve shipyard capacity and efficiency while replacing aging equipment.
- Experiment with the use of private shipyards for a greater share of maintenance needs to meet shortfalls.

Sealift Capacity

The Lynchpin of Offshore Balancing

A U.S. grand strategy of offshore balancing relies on the credible capability to deploy and sustain American forces in distant, contested theaters in order to quell aggressive adversaries seeking to upend regional power balances.

Coordinated through U.S. Transportation Command within the DoD, America uses a combination of strategic air and sea transport to move people and cargo between theaters, relying on military and civilian-owned capabilities for each as needed. Air transport, coordinated by the United States Air Force's Air Mobility Command, is most commonly used for transporting troops between regions. However, sea transport, coordinated by the U.S. Navy's Military Sealift Command, is the irreplaceable logistical lynchpin of any U.S. crisis response.



The USNS Watkins, a Large, Medium-Speed Roll-on/Roll-off ship of Military Sealift Command, loads cargo during U.S. Transportation Command's 2019 "turbo activation" readiness test." (U.S. Army photo by Steve J. Mirrer 2019). No changes were made to this photo.

The necessity of sealift comes down to capacity and cost. The Federation of American Scientists estimated how much cargo could be delivered by spending \$20 million to transport it 4,000 miles. The estimate compared the efficiency of airlift via C-17 Globemasters and sealift via large medium-speed roll-on/roll-off (RO/RO) ships (RO/RO vessels are the most effective for quickly loading and unloading heavy equipment). The FAS found that while airlift could deliver 72,000 tons of cargo in 36 days, sealift could deliver 3,960,000 tons over the same time-span.⁴⁵

While slower and more vulnerable, sealift is exponentially more efficient, which is why it is expect-

ed to be responsible for delivering more than 90% of the cargo needed by any units deployed to a hotly contested region.⁴⁶

As such, maintaining a formidable sealift capacity and the readiness to quickly activate it is essential for reassuring allies and minimizing the risk of emboldening adversaries during a transition away from heavy regional forward-basing presence. To meet these core needs of an offshore balancing strategy, the Navy needs to ensure continued investment in meeting its current sealift capability targets and consider raising this capacity further, to support operations with fewer forward bases. Since the end of the Cold War through 2018, the DoD has nearly consistently set its sealift capacity requirements for a major conflict at more than 19 million square feet of cargo in its Mobility Capabilities and Requirement Studies (MCRS).⁴⁷ Of this total, 15.3 million square feet is to be provided by government-owned vessels and the remainder from U.S. commercial ships of the Maritime Security Program.⁴⁸

Current Sealift Capabilities and Their Roles

The U.S. Navy's Military Sealift Command (MSC) maintains 120 active and reserve ships providing a variety of important logistical functions. Of these vessels, the most important for meeting the bulk of sealift needs are the Navy-controlled or activated ships of the Surge Sealift Fleet and Ready Reserve Force (both referred here as the Sealift Force) as well as its Combat Logistics Fleet, responsible for sustainment operations. The Sealift Force is what the U.S. would use to initially transport the heavy equipment and supplies of U.S. forces to a region to begin with. This initial "surge" of equipment comprises the 15.3 million square feet the DoD's Mobility Capabilities and Requirements Study plans for and expects the Sealift Force to be ready to begin transporting on mere days' notice. In other words, effective sealift is indispensable to meet the daunting logistical readiness challenge offshore balancing presents.

Under the Military Sealift Command umbrella, multiple authorities manage different components of the United States's sealift capacity. The Sealift Force's two components are the 15 ships of the MSC's Surge

Sealift Fleet and the 46 government-owned ships of the Ready Reserve Force (RRF), administered by the Department of Transportation's Maritime Administration. The RRF relies on funding from the Navy and can be activated and commanded by Military Sealift Command during crises.⁴⁹

After U.S. forces are deployed, "sustainment sealift" keeps them supplied with necessities like food, replacement fuel, and ammunition. U.S. ground forces are largely sustained through the DOT's Maritime Security Program of subsidized U.S. commercial vessels. Naval assets are sustained through the Navy's own 29-ship Combat Logistics Fleet (CLF), overseen through Military Sealift Command. While the commercially-crewed MSP is also vital for executing offshore balancing, this paper puts greater focus on the Navy-operated CLF when considering the Navy's own spending priorities for meeting sustainment sealift needs.

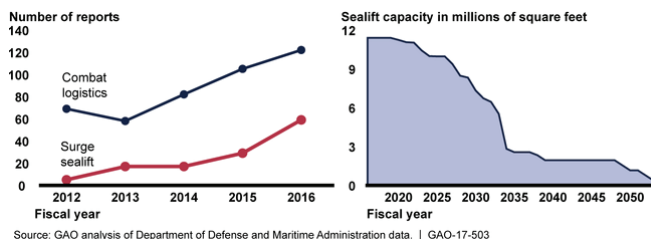
The CLF carries out "underway replenishments" of deployed ships, such as those in carrier battle groups, enabling them to remain on-station longer. Given the central role of Naval missions under an offshore balancing strategy, this capability is crucial. Effective naval sustainment facilitates conventional peacetime missions such as defending the commons. During a crisis, sustainment maximizes the effectiveness of our existing resources by enabling them to remain on-station longer to assist allies in securing sea control or in imposing naval blockades on adversaries.

In a hypothetical conflict with China, for example, keeping ships deployed to cut off the nearly 80% of Chinese crude oil imports that enter the South China Sea through the Strait of Malacca would be a top priority for acquiring the leverage needed to rapidly bring hostilities to a halt.⁵⁰ Maintaining the number of ships continuously on-station needed to cover possible alternative routes, such as the Sunda and Lombok Straits, or to help support Australian allies in interdiction further east would require extensive use of the Combat Logistics Fleet as well.⁵¹

An Aging Sealift Fleet Will Leave the United States Handicapped

Unfortunately, the readiness of the Navy-controlled Surge Fleet and CLF is in decline and both are rapidly aging. As shown in Figure 1, Government Accountability Office found that the Surge Sealift and Combat Logistics Fleets faced an increasing number of equipment “casualties,” (damaged or broken components) between 2012 and 2016, and that both fleets encountered longer-than-expected maintenance periods.⁵² Additionally, the combined average age of ships in both fleets is roughly 43 years, while the ships of the DOT-operated Ready Reserve Force average 45 years old.⁵³ Alarming, the number of Surge Sealift ships reaching the end of their service lives over the next decade would reduce Surge Sealift capacity by more than 25% without action taken to procure replacements. In its March 2018 report to Congress, “Sealift That The Nation Needs” the Navy estimated that without adequate recapitalization, its sealift capacity would shrink to 12 million square feet by 2030, and plummet further to only 7.5 million square feet by 2035, or less than half of its 15.3 million square foot surge capacity readiness requirement.⁵⁴

Figure 1: Increasing Equipment Casualties and Declining Sealift Capacity (GAO)



Source: GAO analysis of Department of Defense and Maritime Administration data. | GAO-17-503

Options for Recapitalizing U.S. Sealift

To address this shortfall, the Navy and the DOT's Maritime Administration (responsible for the Ready Reserve Force), have devised a short, medium, and long-term strategy. In the short and medium-term, the Navy has set aside roughly \$242 million for sealift recapitalization. Most immediately, the Navy will perform 31 life extensions on existing vessels where there is sufficient benefit to justify the cost. In the medium-term, the Navy will seek to buy 26 used but

younger commercial ships and retrofit them for roll-on/roll-off capacity as older vessels retire.⁵⁵

Longer-term, the Navy is considering building a new class of standardized supply ships, called the Common Hull Auxiliary Multi-Mission Platform (CHAMP) that could perform both sealift and more specialized support missions like submarine tending, aviation logistics, command and control, or hospital services. After the Office of Budget and Management estimated that the price of a hull that could perform all of these missions would be over \$1 billion apiece, the Navy announced its intention to split the CHAMP program into two sealift-optimized and people-optimized variants.⁵⁶ At this point, the Navy's FY 2020 long-range shipbuilding plan places the first CHAMP ship delivery at FY 2028, but there have been several calls internally to accelerate initial delivery to FY 2026 or even 2023.⁵⁷

Compared to cheaper commercial refits, \$1 billion hulls for supply ships may not be a sustainable answer to the Navy's emerging logistical bottleneck. But Congress should be prepared to fully fund life extensions and the acquisition and retrofitting of used commercial ships for the DOD in the short term. While improving the specialization of the CHAMP program can hopefully significantly reduce costs, Congress should be prepared to make the necessary investments in a reasonably priced CHAMP variant or an alternative in order to meet longer-term sealift capacity requirements. Dollars spent on sealift readiness will have an outsized impact--they can allow the United States to more safely realize savings from a reduced overseas base footprint and smaller army size while maintaining the ability to protect vital national interests.

You Can't "Surge" If You Can't Leave Port: Readiness and Crewing

Another challenge for the Navy, even if it can meet basic sealift capacity targets, is supporting the Sealift Force's short-term activation readiness. In 2019, U.S. Transportation Command conducted its largest ever "turbo activation," a dress rehearsal for emergency sealift mobilization in the event of a crisis. Concerningly, only 40.7% of the 61 ships of the

the Sealift Force (the Surge Sealift Fleet and Ready Reserve Force) were fully ready to support a major sealift operation within their 5-day target window for activation.⁵⁸ The DOD's standard target for turbo activation is 85% of vessels at 5-day readiness.⁵⁹ Worse still, many vessels that failed were significantly below readiness, with 22 of the 61 total at "C-5" or "C-4" readiness levels.⁶⁰ A C-5 rating indicates a ship cannot leave its dock, while a C-4 rating means that the vessel can leave its moorings but isn't in sea-worthy condition--effectively of no use for strategic sealift needs.

Even if the U.S. improves its ability to activate its sealift ships in the first place, adequate crewing is another bottleneck, particularly for the Ready Reserve Force. Rear Admiral Mark Buzby, head of the Maritime Administration (which runs the RRF), recently told Defense News that despite initial capability to crew existing ships, "the problem is going to manifest itself four to six months down the line when some of the crew want to rotate."⁶¹ The Maritime Administration estimates that it has 11,768 qualified mariners with the necessary credentials available to crew the Ready Reserve force, barely exceeding the estimated 11,678 mariners presumed necessary to crew both the RRF and U.S. commercial fleet simultaneously.⁶² Given the volunteer nature of RRF service, this is a huge problem, as virtually the entire pool of qualified U.S. mariners would have to be willing and able sail when needed. In order to crew a longer-term sustainment effort, the Maritime Administration estimates it is about 1,800 mariners short of the capacity it needs to be able to rotate crew as part of a national mobilization.⁶³

One of the compounding factors harming sealift readiness is that many of the ships of the Ready Reserve Force use outdated steam turbines. These turbines are increasingly rare in commercial shipping. These outmoded systems limit the pool of engineers who know how to operate them, highlighting the Sealift Force's need for more modern ships to close this skills gap.

Additionally, even under routine peacetime operations, the Combat Logistics Fleet's ability to provide underway replenishments, necessary for keeping Naval assets deployed independently of port stops,

decreased 27% from 2011 to 2015.⁶⁴ In-port refueling now comprises almost a third of U.S. Naval surface combatants' refueling time, despite the Navy consistently deploying roughly 100 ships at once since the end of the Cold War. In the event of a conflict, the Navy has already raised fears that it will be "unable to deliver the equipment, supplies, and forces called for in the initial phases of operational plans."⁶⁵ Particularly in the context of a great power conflict, where conventionally relied upon supply ports may be closed to U.S. forces or too damaged to use, underway replenishment will prove even more crucial.

Though outside the scope of Naval spending priorities, legislators should also consider policy remedies that will support Naval sealift goals by revitalizing the decaying U.S. commercial shipping industry. To reverse the alarmingly shrinking size of the private U.S. shipping industry, which supplements sealift capacity in crises and plays a major part in sustaining U.S. ground forces, policymakers need to consider repeal of the protectionist Jones Act. Despite an intent to preserve a domestic sealift capability, the Jones Act has driven the progressive downsizing of the U.S. commercial fleet. The Act makes construction prohibitively expensive through domestic build requirements and by removing incentives to innovate and specialize in the face of globalization that could keep U.S. private shipping more viable.⁶⁶ As of 2015, the Maritime Administration listed only 124 active U.S. shipyards, of which only 22 were mid-sized to large facilities capable of militarily useful construction.⁶⁷ By contrast, China is estimated to have more 2,000 shipyards.⁶⁸

Summary of Key Solutions

- Fund efforts to recapitalize the sealift fleets through life extensions that pass cost-benefit analysis.
- Fund medium-term acquisitions and conversions of commercial vessels.
- Continue CHAMP-style purpose-built vessels longer-term, with an eye towards cost.
- Repeal the Jones Act, which would stem the decline of available U.S. merchant shipping and qualified crew during crisis.

A Sustainable Fleet Structure that Embraces American Advantages

Current Strategy Does Not Favor the United States

Long-term, the most important threat to America's vital interests that the U.S. Navy should prepare for is the prospect of potential Chinese aggression against regional neighbors in East Asia. The United States continues to experience relative economic decline compared to China's growth trends. Should China's comparative gains continue and translate into more externally deployable military power, current American strategies, which rely on the United States's ability to knock out increasingly mature Chinese Anti-Access/Area-Denial (A2/AD) capabilities, will become untenable. Naval defense investments should maximize deterrent value per dollar. Adopting this approach will improve U.S. ability to continue maintaining the regional balance of power. Reorienting American fleet structure to play to the United States and its partners's strengths, and against China's geographical weaknesses will make a transition to a more sustainable grand strategy less regionally risky.

Unfortunately, the Navy's current fleet structure is built to execute a strategy that plays to the strengths of potential adversaries' A2/AD capabilities. Previous doctrinal concepts such as "AirSea Battle" and its successor, the more multi-branch and domain-integrated "Joint Concept for Access and Maneuver in the Global Commons"⁶⁹ (JAM-GC) effectively plan for wielding the offensive capability necessary to continue to exercise sea control within the commons an adversary contests. Doing so under conditions favorable to the United States makes sense, but these doctrines also routinely encourage U.S. assets to project force into territory where they face severe local disadvantages.⁷⁰

Under current strategies, the Navy is called to retain the ability to operate inside an adversary's A2/AD "bubble," or most potent missile ranges. But against adversaries with increasingly capable A2/AD technology, this approach is limiting. The United States needs to be prepared to raise the costs of would-be Chinese aggression enough to swiftly bring it to a

halt. America cannot hope to do so longer-term while it continues to put expensive assets at risk of destruction by cheap missile systems. Unfortunately, that's the reality of basing U.S. deterrence on the Navy's ability to absorb A2/AD salvos in environments where U.S. forces face the greatest disadvantages against them.

In 2016, the RAND Corporation demonstrated this contrast by comparing rough estimates of the costs of A2/AD and force projection systems. The study found that the cost ratio of various A2/AD capabilities, including the marginal costs of the number of missiles typically needed to defeat a force-projection system such as a ship or aircraft, was roughly *fifty times less* than the cost of its target.⁷¹ RAND estimated the cost of paying for an aircraft carrier versus the numbers of anti-ship ballistic missiles necessary to defeat it at over 230:1.⁷² While critics may take issue with the numbers of weapons deemed necessary to defeat various assets in the report, or the need to consider the overall costs of acquiring and maintaining the A2/AD systems necessary to effectively deploy them against force-projection assets, the underlying resource imbalance remains clear.

Particularly against near-peer competitors, no prudent U.S. doctrinal concept can ignore spending considerations. Americans are already questioning the long-term sustainability of combating lightly armed insurgents in Afghanistan with expensive laser-guided munitions. Continuing military strategies that would replicate these economic blunders under far higher stakes is irresponsible to U.S. interests. U.S. fleet structure and East Asian naval strategy must not readily allow China to cheaply and easily destroy expensive U.S. assets. As the United States experiences relative economic decline against its principal rival, America's Navy must be oriented to execute strategies economically sustainable enough to be strategically credible.

U.S. Fleet Structure Should Play to America's Advantages, not China's

Sometimes, the costs of expensive assets is worth the benefit they provide--in other cases, the price-tags no longer pass strategic muster. The new Columbia-class ballistic missile submarines, for instance, cost billions apiece. Nevertheless, their high survivability and additional strategic value as part of the nuclear deterrent make them well-worth the investment. The same can no longer be said of aircraft carriers, which the United States should cease purchasing.

While state-of-the-art, the first carrier of the new *Ford* class has already cost upwards of \$13 billion and is still not yet fully operational despite significant delays.⁷³ Instead of new acquisitions, the U.S. should gradually retire and mothball its current carrier fleet overtime as each ship lives out its planned service life, allowing for reinvestment in other systems. This would still leave the U.S. with 7 carriers by 2052, and four through 2072, available for less risky force projection needs that fit U.S. interests.⁷⁴

Given economic and strategic realities, the United States's shipbuilding plans should reorient from relying on highly capable but expensive and difficult-to-replace assets towards what Marine Corps Commandant General David Berger identified in his own force development framework as "mass without vulnerability of concentration."⁷⁵

Following a similar guiding principle, the U.S. Navy should seek to be able to bring substantial force to bear without making targeting easier for its adversaries. A fleet comprising more assets that are cheaper to build has a more realistic chance of meeting Congress's 2018 NDAA mandate of 355 ships. Being able to increase the fleet size at a more palatable cost would also allow the Navy to more widely disperse its assets in the face of A2/AD-capable adversaries, reducing ships' risks of being detected and overwhelmed due to target groupings optimal for U.S. opponents to concentrate their limited missile assets on. Further, without the strategic liability of gargantuan price tags (as battleships in turn faced before the carrier era), the United States can more sustainably absorb and replace losses

should conflict break out, reducing the value of a surprise attack by an adversary.

What could alternative systems look like? There are already several promising options under development that might more cheaply and credibly help support allies and raise the costs of adversarial aggression, particularly in East Asia.

Applied to East Asia, an offshore balancing grand strategy calls for the United States to assist its regional partners in developing their own sophisticated A2/AD capabilities. Supporting partners' development of A2/AD systems would allow them to harness the defensive advantages China currently employs against U.S. force projection. U.S. partners in East Asia enjoy favorable geographic advantages against Chinese force projection as is. Developing A2/AD capabilities would allow them to prohibitively raise the price of Chinese territorial aggression at a cost sustainable for their own economies.⁷⁶ The U.S. Navy would be able to further supplement such A2/AD defenses in a crisis by increasing the lethality of its own ships. This is best achieved by increasing the number of missile tubes (vertical launch system cells) the Navy can bring to bear against an opposing force. More available missiles means more available deterrent "mass."

One intriguing proposal for significantly increasing the number of missiles the Navy can deploy through comparatively cheap units is the concept of equipping former tanker or cargo ships with the capability to carry containerized missile systems. Cruise and ballistic missile technology has now modernized to the point where munitions can be fired from internationally standardized shipping containers, a capability that Russia, China, and Israel have already produced.⁷⁷ At between \$25 to \$50 million per ship,⁷⁸ double-hulled container or cargo ships are cheap to construct, fairly resilient against oncoming fire (as the 1980s "tanker war" in the Persian Gulf demonstrated), and could be economically converted to ships by adding containerized launcher units and command-and-control systems, while relying on more expensive sensor capabilities to be provided by other assets working in concert.⁷⁹

The math for containerized missile ships adds up. Even assuming a \$75 million conversion estimate for a \$50 million hull (a total cost of \$125 million), the Navy could build three containerized missile ships for less than the cost of a single, far less strategically potent \$400 million Littoral Combat Ship.⁸⁰ Instead of a new Ford-class aircraft carrier, a \$13 billion investment could buy 104 containerized missile ships, deploying between 3,120 and 5,200 missiles, based on what proponents consider a strategically optimal per-ship magazine size of roughly 30-50 containerized missiles.⁸¹ The excess space on these ships could also provide room for measures to improve survivability, such as perimeter layers of containers filled with sandbags or foam to absorb enemy missile impacts.⁸²

Pairing these out-of-the-box ship concepts with autonomous technology can offer additional options for sustainable force projection. Platforms such as vertical take-off and landing (VTOL)-capable drones, unmanned surface vessels, and submarines capable of laying mines in straits key for shipping, would allow the U.S. Navy to impose heavy costs on potential Chinese aggression.⁸³ The consistent benefit of all these assets? Each would help the United States defend the East Asian balance of power by strengthening its existing geographical advantages against force projection rather than attempting to overcome the PRC's own geographic advantages. As more economically sustainable options for operations inside the Chinese A2/AD bubble, such systems could raise the costs of aggression, supplement manned U.S. assets further back, and support partners' A2/AD defenses while remaining a credible deterrent due to their replaceability.⁸⁴

Summary of Key Solutions

- End the acquisition of naval assets that are expensive for the United States to produce but easy for adversaries to cheaply destroy.
- Purchase naval assets that are cheaper, more dispersible, and more expendable delivery systems for force projection that can bring missile capabilities to bear more efficiently to raise the cost of aggression by near-peer competitors such as China.

- Facilitate a strategy of swiftly halting Chinese aggression by denying them use of the commons necessary to attack allies rather than seeking to project sufficient force to knock out PRC A2/AD capabilities, which does not favor "long-term U.S. economic capacity.

Conclusion

Policymakers are bound to be confronted with the increasing realities of limited resources in the decades to come, and service chiefs need to be prepared for an era of declining or stagnating budgets. A grand strategy of offshore balancing would be well-suited under such constraints to support safer U.S. retrenchment efforts. This approach would allow the United States to continue to protect its vital interests while shedding deployments less salient to them, a process other great powers experiencing relative decline have previously accomplished. Given its central role in a grand strategy of offshore balancing, the Navy should consider its investments carefully in order to facilitate a transition to such a strategy with reduced risk to regional partners and U.S. influence. By improving its shipyard infrastructure, sealift capacity and readiness, and creating a more cost-effective, lethal, and dispersible fleet, the U.S. Navy can support a more sustainable strategic posture and maximize its ability to peacefully preserve the status quo for decades to come.

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