Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2019

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Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2019

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I. Reporting Requirement

This report is submitted per Section 231 of Title 10, United States Code. Appendices 1-8 provide supporting details. Appendix 8 is controlled under limited distribution.

II. Submission of the Report

This report is the Department of the Navy's (DoN) 30-year shipbuilding plan for FY2019-FY2048. The FY2019 President's Budget (PB2019) provides sufficient funding to procure the ships included in the FY2019-FY2023 Future Years Defense Program (FYDP). Per FY2018 National Defense Authorization Act (NDAA) direction, Auxiliary vessels are now included in this report (Appendix 7). Unless otherwise noted, funding levels are shown in constant year FY2018 dollars.

III. Key Themes in this Report

The National Defense Strategy provides the overarching guidance and high level requirements for establishing the *Navy the Nation Needs (NNN)*, the Navy's plan for building and sustaining a lethal, resilient force through balanced investments across readiness, capability, and capacity. This 30-year shipbuilding plan is the foundation for growing capacity with the following key themes:

- Acts on the policy legislation provided by Congress in the 2018 NDAA, which supports Navy's validated NNN requirement for 355 Battle Force ships.
- Includes 54 Battle Force ships within the FYDP (11 more than PB2018 request), and all candidate Service Life Extensions (SLE).
- Anticipates achieving a 355 ship Battle Force beyond 2050, but also frames options for potentially accelerating to the 2030s with additional resources, service life extensions, and strong industry response.
- Provides scalable acquisition profiles that promote a stable and efficient industrial base that encourages industry investment in capital improvements, capital expansion, and a properly sized world-class workforce.

IV. Force Structure Assessment and Fleet Architecture

In December 2016, the Chief of Naval Operations completed a Force Structure Assessment (FSA) to determine the correct balance and mix of platforms needed to address the evolving and increasingly complex responsibilities of the Navy. The FSA detailed a requirement for 355 ships based upon analysis and acceptable strategic and operational risk. In accordance with the FY2016 NDAA, and in addition to the FSA, the Navy also sponsored three independent studies of alternative fleet architectures for the 2030 timeframe, roughly the middle of the timeframe covered by this report. The findings of these studies were assessed and incorporated into the 355 ship architecture, as were the most promising elements of advanced development

and rapid fielding efforts supported by a robust program of war games, technology demonstrations, and prototyping. The Navy then commissioned a "red team" to evaluate these studies to further refine the "best of breed" alternatives. The resulting mix of 355 ships was in-turn supported by 2018 NDAA legislation as the required Battle Force for the NNN. Results are summarized in Appendix 1, Table A1-1.

V. Unmanned Systems

Unmanned systems were included in the above analysis and continue to advance in capability and capacity. These systems are key enablers for the battle force through all phases of warfare and are integral to Navy's wargames, exercises and real-world operations. For PB2019, unmanned systems are not included in the shipbuilding plan; rather, they are accounted for in advanced capability weapons and sensors portfolios. Navy is committed to unmanned capabilities and will continue to evaluate progression as they potentially move more towards viable platform replacement options.

VI. Long-Range Plan – Balanced, Stable, Scalable

The National Defense Strategy (NDS) articulates how the United States military will compete, deter and win with a more lethal, resilient, and rapidly innovating Joint Force in an increasingly complex security environment. This environment is defined by rapid technological change, challenges from adversaries in every operating domain, and the impact on readiness from the longest continuous stretch of armed conflict in our Nation's history. The Navy's overarching plan in support of the NDS is referred to as the *Navy the Nation Needs (NNN)*. The six pillars of the NNN are Readiness, Capability, Capacity, Manning, Networks, and Operating Concepts. These six pillars must remain balanced and scalable in order to field the needed credible naval power, guarding against over-investment in one area that might disadvantage another. This disciplined approach ensures force structure growth accounts for commensurate, properly phased investments across all six pillars – a balanced warfighting investment strategy to fund the total ownership cost of the Navy (manning, support, training, infrastructure, etc.).

Within this context, this shipbuilding plan defines the framework for working together with Congress to attain the 355 ship NNN warfighting requirement per the 2018 NDAA. There are three prioritized elements of the shipbuilding plan that the Navy will pursue to grow the force.

(1) Steady, Sustainable Growth (SG). Establish minimum baseline acquisition profiles that grow the force at a sustainable, affordable rate while protecting the overall balanced warfighting investment strategy. Of particular importance is the sustainment of the industrial base at a level that supports affordable acquisition, predictable and efficient maintenance and modernization, and an appropriately sized workforce for more aggressive growth if additional resources become available. Steady profiles ensure there is enduring focus on the long-view.

(2) Aggressive Growth (AG). More quickly attains the same warfighting requirement as available industrial capacity and increased resources permit, building upon the foundation of steady growth without threatening the long-term competitive posture of a balanced warfighting investment plan. This is the demarcation between a profile that must be sustained (steady growth) and a profile that can be attained (aggressive growth). Navy will proactively invest above the baseline steady profiles if also able to remain balanced across the NNN pillars.

(3) Service Life Extensions (SLE). SLEs provide near-term opportunities to sustain

inventory to more rapidly achieve NNN requirements. Because SLEs are relatively short-term extensions, they are carefully balanced with the steady long-term growth profiles discussed above to ensure overall higher numbers when SLEs expire. Candidate ships are evaluated for restoration, their ability to be upgraded with current systems, anticipated additional life, and cost vs. replacement (or other higher priority investments). Reactivation of retired Battle Force ships to sustain the force is also considered under this priority; however, due to their poor condition they typically provide a limited return on investment.

The PB2019 30-year shipbuilding plan includes 54 Battle Force ships within the FYDP, 11 more than PB2018; 4 of which filled gaps to achieve the long-term profiles (steady growth) and an additional 7 that were able to be added above the steady growth profiles (aggressive growth). All SLE candidates meeting criteria were also funded, including six Ticonderoga class cruisers, four Mine Countermeasures ships, and the first of potentially five Los Angeles class attack submarines.

Appendix 3, Tables A3-1 through A3-4 illustrate the 30-year program that builds toward the NNN objective at a steady, sustainable, and affordable rate, projected to reach the approximate mix of 355 ships in the early 2050s. As shown in Appendix 5, Figure A5-1, average ship construction funding across the FYDP is $20B per year (FY18 constant dollars), which along with the funded SLE's provides firm near-term footing for moving forward. Beyond the FYDP, additional funding would be needed to sustain steady growth and to account for the serial production of the Columbia class SSBN. Aggressive growth options would come after that. With a diligent approach to SLEs, strong industry response, and additional resources, 355 ships could be attained by the 2030s.

Given that the types of ships and capabilities procured over this 30-year timespan will evolve with technology and threat advances, the accuracy and reliability of this plan decrease over the 30-year time horizon. As a hedge against this uncertainty, protecting the baseline acquisition profiles provides long-term foundational stability for thoughtful, agile modernization and a clearer forecast of when to evolve to the next ship design (1st shipbuilding priority). Aspects of the Navy's plan with the highest confidence in design and cost over the 30-year timeframe include ballistic missile submarines, attack submarines, amphibious ships, combat logistics ships, and aircraft carriers. The steady-state plan achieves 12 aircraft carriers beyond 2060, making it the last ship class to achieve its NNN requirement; options to accelerate are under review, including multi-ship procurements and reducing centers (years between procurements).

Surface combatant and attack submarine capabilities are the most dynamic and will likely evolve substantially to align with growing operational demands, availability of emerging technologies, introduction of unmanned and autonomous systems, and more capable sensors and payloads. Accordingly, the Navy will continue to analyze and update the Surface Capability Evolution Plan (SCEP), the Tactical Submarine Evolution Plan (TSEP), and all supporting plans (aviation, ordnance, etc.) for alignment of capabilities and appropriate NNN adjustments. This analysis is an enduring, responsive process that increasingly values agile and adaptable lethality against thinking, reactive adversaries. This approach naturally drives speed, lethality, stealth, information, and design margin for plug-and-play modernization as key attributes for future platforms – providing warfighting commanders composable capabilities in increasingly uncertain and contested environments across the spectrum of competition, up to full-scale conflict. The prioritized shipbuilding plan assigns the highest priority to these frontline combat platforms, affording the opportunity to quickly adopt new capabilities in response to emerging

disruptive capabilities – both ours and theirs – move to a new modernization effort, or move to a new platform design.

VII. Industrial Base

An efficient and supported industrial base is a fundamental requirement to achieving and sustaining the Navy's baseline acquisition profiles. Our shipbuilding industrial base and supporting vendor base constitute a national security imperative that is unique and that must be properly managed and protected. Over the previous five decades 14 defense-related new-construction shipyards have closed, 3 have left the defense industry, and one new shipyard has opened. Today, the Navy contracts primarily with 7 private new-construction shipyards to build our future Battle Force, representing significantly less capacity than our principal competitors. If faced with the demands of a major conflict it may be possible to engage other industries to assist, but the cost of such assistance is currently unquantifiable. The challenge of today's security environment portends agility and efficiency, and this prioritized plan takes an aggressive step in that direction.

For historical context, the "boom and bust" profiles of the last 60 years are shown in Appendix 4. These profiles show sharp peaks in shipbuilding, followed by significant breaks – valleys – in production that severely degraded the ability to plan for the long-term or respond in the near-term, devastated workforce experience and efficiency that is becoming increasingly more difficult to reconstitute, and contributed to significantly longer timelines to build ships with attendant significant cost growth. The steady, sustainable baseline shipbuilding profiles shown in figure A3-5 will establish industrial efficiency and agility, and protect workforce experience in order to remain competitive long-term.

Industry recognizes its critical role and has shown a strong desire to drive improved performance to meet Navy's needs. The Navy's role is to be a knowledgeable and demanding customer, to define the requirement, and to work with Congress to establish the foundational profiles to attain it. This should provide clarity and confidence that will inform industry investment in capital improvement and expansion, research and development, and a world-class workforce – the historically demonstrated key contributors to winning in any timeframe.

VIII. Summary

This 30-year shipbuilding plan is structured with a FYDP view of PB2019 funding levels carried forward. This plan is consistent with the Secretary of Defense's direction to focus PB2018 on improving warfighting readiness, and to focus PB2019 on the 2018 NDAA and National Defense Strategy priorities of growing capability and capacity.

The PB2019 NNN shipbuilding plan puts the Navy on a path to 326 ships by FY2023 and 355 ships by the early 2050s (NNN requirement for all ships except CVNs, which achieves 12 ships beyond 2060), assuming sufficient funding and execution of service life extensions. It is a realistic plan that reflects the imperative to remain balanced across the NNN priorities in an era of unpredictable and restrictive funding levels. The Navy realizes that a plan to achieve today's warfighting requirement in three decades represents an unacceptable pace in the context of the current and predicted security environment. Accordingly, a valuable feature of this plan is responsive scalability. By setting the conditions for an enduring industrial base as a top priority, we are postured to aggressively respond to more investment in any year, which if received in all years could attain the warfighting NNN target of 355 ships as early as the 2030s – balanced,

credible and sustainable – by leveraging all available tools for growing the force. In conjunction with pursuing required long-term, predictable funding, and in concert with the Secretary of Navy's business reform initiatives, the Navy continues to aggressively pursue acquisition strategies to build ships more quickly and more affordably.

Appendix 1

Difference between the 2014 Force Structure Assessment and he 2016 Navy the Nation Needs (NNN)

Table A1-1 shows the results of the 2016 NNN – an objective force of 355 Battle Force ships – relative to the 2014 FSA update.

Table A1-1. 2016 Navy the Nation Needs

Type / Class	2014 FSA	2016 NNN
Ballistic Missile Submarines[1]	12	12
Aircraft Carriers[2]	11	12
Attack Submarines	48	66
Guided Missile Submarines[3]	0	0
Large, Multi-Mission, Surface Combatants	88	104
Small, Multi-Role, Surface Combatants	52	52
Amphibious Warfare Ships	34	38
Combat Logistics Force	29	32
Command and Support	34	39
Total	**308**	**355**

The Navy will continue to analyze and evolve the architecture of the NNN in response to new capabilities, and evolution and expansion of the threat. This is an enduring, responsive process that values agility and plug-and-play adaptability, both in our platforms and the industrial base that builds them. The prioritized shipbuilding plan affords the opportunity to quickly adopt new capabilities in response to emerging, disruptive capabilities – both ours and theirs – move to a new modernization effort, or move to a new platform design.

[1] Replace the 14 Ohio-class SSBNs with 12 new Columbia-class SSBNs starting in the late 2020s. Operational availability will be comparable.

[2] The current profile will achieve the NNN requirement of 12 ships beyond 2060; options to accelerate are under review including multi-ship procurements and reducing procurement centers.

[3] The 4 SSGNs now in service retire in the mid-2020s. To meet NNN submarine payload and Special Forces requirements when the 4 SSGNs retire, Navy is inserting Virginia Payload Modules (VPM) into Block V Virginia-class attack submarines beginning in FY2019. A payload-based large diameter submarine will follow VPM late in the plan in accordance with the Tactical Submarine Evolution Plan (TSEP), which features a fast, lethal next generation attack submarine and a large-diameter, next-generation payload-based submarine.

Appendix 2

PB19 Shipbuilding Plan (FY2019-FY2023)

Table A2-1 displays the DoN's President's Budget PB2019 (FYDP) shipbuilding plan.

Table A2-1. FY2019-2023 New Construction Shipbuilding Procurement and Funding Plan (TY$M)

	FY19		FY20		FY21		FY22		FY23		FYDP	
Ship Type ($M)	**$**	**Qty**	**$**	**Qty**	**$**	**Qty**	**$**	**Qty**	**$**	**Qty**	**$**	**Qty**
CVN 78[1]	1,598		2,147		3,240		2,911		3,378	1	13,274	1
DDG 51	5,645	3	3,777	2	5,146	3	5,197	3	5,326	3	25,091	14
LCS[2]	646	1									646	1
FFG(X)[3,4]			1,191	1	843	1	1,750	2	1,792	2	5,576	6
SSN 774[5]	7,170	2	7,150	2	6,476	2	6,004	2	6,126	2	32,926	10
SSBN 826[6]	3,005		1,453		4,215	1	4,198		3,876		16,747	1
LX(R)			1,838	1			1,704	1	1,739	1	5,281	3
LHA(R)[7]									192		192	
ESB	650	1	650	1							1,300	2
T-AO 205	1,052	2	536	1	1,035	2	523	1	1,103	2	4,249	8
T-ATS(X)	80	1	153	2	74	1	75	1	77	1	459	6
T-AGOS (X)							344	1	369	1	713	2
Total New Construction[8]	**19,846**	**10**	**18,895**	**10**	**21,029**	**10**	**22,706**	**11**	**23,978**	**13**	**106,454**	**54**

Notes:

1. Funding for the CVN 78- class program reflects 6-yrs incremental funding authorized in the 2013 NDAA.
2. Funding does not include LCS mission modules, which are funded in Other Procurement, Navy (OPN).
3. FFG cost estimates are placeholders and do not reflect the approved threshold and objective cost levels that will be further refined in Conceptual Design phase.
4. New ships planned for future procurement or for replacement of legacy ships are annotated with (X) until their class has been named, such as FFG(X) and T-ATS(X).
5. Includes first VPM in FY2019, and then on each SSN thereafter.
6. FY2021 represents incremental funding for the lead ship: FY2021=41% ($3.6B), FY2022=35% ($3.1B), FY2023=24% (2.1B).
7. Advance procurement funding for LHA 9 in FY2023.
8. Funding for Total Ownership Cost (personnel, training, infrastructure, etc.) is in addition to funding for shipbuilding. TOC is phased with delivery of Battle Force ships within the FYDP.

FYDP highlights of the PB2019 budget submission include:

- First year of full funding for the fourth Ford-class aircraft carrier CVN 81 in FY2023.
- The addition of four DDG 51 Flight III ships (three more ships added to the previous FY18 to FY22 multi-year procurement (MYP)).
- Procurement of one LCS platform in FY2019 and transition to the frigate design beginning in FY2020.
- Procurement of the lead Columbia-class SSBN in FY2021.
- Continuation of two per year Virginia-class submarines ten-ship MYP from FY2019-2023.

- The planned procurement of the lead LX(R) in FY2020 with serial production starting with the second ship in FY2022.
- Continued serial production of the fleet oiler replacement with the T-AO 205 class with additional ships added in FY2019, FY2021 and FY2023, additional T-ESBs in FY2019 and FY2020, continued serial production of the T-ATS(X) ships and the planned procurement of the T-AGOS(X) ships beginning in FY2022.

Appendix 3

Long-Range Naval Vessel Inventory

Summarizing from paragraph VI of the main report, the central theme is a balanced warfighting investment portfolio across the six pillars of the *Navy the Nation Needs (NNN)* – Readiness, Capability, Capacity, Manning, Networks, and Operating Concepts. Accordingly, the enduring three elements of the shipbuilding plan, in priority order, are:

(1) Steady, sustainable growth (SG). Establish baseline acquisition profiles that grow a modern, adaptable force at a sustainable, affordable rate. As a result of the resources added to PB2019, baseline acquisition profiles were established within the overall warfighting balance.

(2) Aggressive growth (AG). More quickly attains the same balanced warfighting requirement as industrial capacity and increased resources permit, building upon the foundation of steady growth above. This is the demarcation between a profile that must be sustained (steady growth) and a profile that can be attained (aggressive growth). Aggressive growth options funded in PB2019 submission included seven ships above the baseline stable growth profile; one additional destroyer (DDG), one acoustic surveillance ship (T-AGOS(X), one Fleet Tug (T-ATS(X)), one Expeditionary Sea Base (ESB), and three Fleet Oilers (T-AO 205).

(3) Service Life Extensions (SLE). Pursue SLEs to sustain force structure and to extend the return on investment of qualifying candidates. All SLE candidates meeting evaluation criteria were funded in the PB2019 FYDP submission, which included six Ticonderoga Class cruisers, four Mine Countermeasures ships, and the first of five Improved Los Angeles class attack submarines.

Tables A3-1 thru A3-4 depicts the Long-Range Vessel Construction and Delivery Plan assuming steady, sustainable procurement. This plan results in the annual Naval Battle Force inventory shown in Table A3-4, which depicts the projected number of ships in service on the last day of each fiscal year. This plan addresses the Navy's most critical shipbuilding needs:

- Building CVNs four years apart (4-year center) instead of five, after CVN 82. This profile achieves NNN requirement of 12 CVNs beyond 2060; options are under review to accelerate, including multi-ship procurements and reducing centers.
- Building 12 Columbia-class SSBNs in support of the Nuclear Posture Review (NPR) and STRATCOM deterrence requirements.
- Establishing a stable profile of 2 per year Attack Submarines (SSN).
- Establishing a stable profile of 2.5 per year Large Surface Combatants (DDG), plus an additional ship in FY2022.
- Establishing a stable profile of 2 per year Small Surface Combatants (LCS, FFG) starting in FY2022, accommodating the transition to FFG(X).
- Increasing the pace for amphibious ship production to support a 12-ship LHD/LHA force and modernized lethality in FY2033, FY2036 and FY2039.
- Addresses the candidate long-term replacement for the NNN payload-based submarine, filled mid-term by Virginia Payload Module (VPM).

Table A3-1. Long-Range Naval Battle Force Construction Plan

Fiscal Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Aircraft Carrier					1					1				1				1				1				1				1
Large Surface Combatant	3	2	3	3	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2
Small Surface Combatant	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Attack Submarines	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Large Payload Submarines																		1			1			1			1			1
Ballistic Missile Submarines			1			1		1	1	1	1	1	1	1	1	1	1													
Amphibious Warfare Ships		1		1	1	2	1	1	2	1	1	1	2	1	1	1				1		1	1	1		1	2	1	1	2
Combat Logistics Force	2	1	2	1	2	1	1	1	1	1	1	1	1	1	1										1		2	2	2	2
Support Vessels	2	3	1	2	2	1	2	2	1	1	1	2	2	2	2	2	1													
Total New Construction Plan	10	10	10	11	13	11	11	11	12	11	11	11	13	12	12	10	9	8	7	7	8	8	8	8	8	8	12	9	10	12

Table A3-2. Naval Battle Force Delivery Plan

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Aircraft Carrier			1					1					1					1				1				1				
Large Surface Combatant	3	3	1	2	5	3	2	3	3	3	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	2	3	3
Small Surface Combatant	3	3	1	4	1		1	2	2	2	2	2	2	2	2	4	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Attack Submarines	3	2	2	2	1	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Large Payload Submarines																								1			1			
Ballistic Missile Submarines									1			1		1	1	1	1	1	1	1	1	1	1							
Amphibious Warfare Ships		1		1	1		1		1	2	1	1	1	2	1	1	2	1	1	2				1		1	2		1	1
Combat Logistics Force		3	2	1	2	1	2	1	1	1	1	1	1	1	1	1											1	2	2	2
Support Vessels	2	2	3	2	1	2	1	1	1	2	2	1	1	2	2	2	2	1		2										
Total Naval Force Deliveries	11	14	10	12	11	8	9	10	11	13	11	10	11	12	12	13	13	10	9	11	8	8	8	8	7	8	11	8	10	10

Table A3-3. Naval Battle Force Retirement Plan

Fiscal Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Aircraft Carrier							-1		-1					-1					-1			-1		-1				-1		-1
Large Surface Combatant						-2	-4	-4	-3	-4	-4	-5	-6	-4	-3	-4	-4	-2	-1			-2	-2	-4	-3	-4	-3	-4	-2	-2
Small Surface Combatant				-3		-8									-1		-1		-1	-1		-1	-3	-3	-5	-4	-3	-3	-1	-4
Attack Submarines	-1	-2	-3	-2	-3	-4	-4	-3	-3	-4	-1	-1		-1						-2	-1	-2	-2		-2	-1	-1	-1	-1	-1
Cruise Missile Submarines								-2	-1	-1																				
Ballistic Missile Submarines									-1	-1	-1	-1	-1		-1	-1	-1	-1	-2	-1	-1	-1								
Amphibious Warfare Ships									-1		-2	-1	-1	-1		-3	-3	-1	-1	-1		-1		-1	-1		-1	-1	-2	-1
Combat Logistics Force			-2	-1	-1	-1	-1	-2	-1	-1	-1	-2		-1	-1	-1	-1											-1	-2	-2
Support Vessels			-3			-1	-1	-1		-1	-2	-2	-2		-2	-2	-1	-2	-1	-2	-3	-1								
Total Naval Force Retirements	-1	-2	-8	-6	-4	-16	-11	-12	-11	-12	-11	-12	-10	-8	-8	-11	-11	-6	-7	-7	-5	-9	-7	-9	-11	-9	-8	-11	-8	-11

Table A3-4. Naval Battle Force Inventory

Fiscal Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Aircraft Carrier	11	11	11	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	10	10	10	11	10	10	9
Large Surface Combatant	92	95	98	99	101	104	103	101	101	100	99	97	93	92	91	90	88	89	90	93	95	96	96	95	94	93	92	91	91	92
Small Surface Combatant	31	34	37	35	39	32	32	33	35	37	39	41	43	45	46	48	51	54	55	56	58	59	58	57	54	52	51	50	51	49
Attack Submarines	52	53	52	52	51	48	46	45	44	42	44	45	47	48	50	52	54	56	58	58	59	59	59	61	61	62	63	64	65	66
SSGNs/Large Payload Submarines	4	4	4	4	4	4	4	2	1																1	1	1	2	2	2
Ballistic Missile Submarines	14	14	14	14	14	14	14	14	13	13	12	11	11	11	11	11	11	11	10	10	10	10	11	12	12	12	12	12	12	12
Amphibious Warfare Ships	33	33	34	34	35	36	36	37	36	37	37	37	37	37	39	37	35	36	36	36	38	37	37	36	36	36	36	37	35	35
Combat Logistics Force	29	29	30	31	31	32	32	32	32	32	32	31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Support Vessels	33	35	34	37	39	39	40	40	41	41	41	41	40	41	41	41	42	42	42	40	39	38	38	38	38	38	38	38	38	38
Total Naval Force Inventory	299	308	314	318	326	321	318	315	314	313	315	314	314	317	321	322	324	331	334	336	342	341	342	341	338	336	336	336	336	335

The mid and far term periods beyond FY2024 become less precise, but provide a base from which to respond to changes due to development of future technology, candidate service life extensions, or threat-based fleet design and architecture decisions. This plan establishes a long term foundation in advance of the increasingly challenging security environment and reflects the continuation of the FYDP commitment to produce a 355 ship Navy with the correct mix of ships; a commitment that increasingly values speed, lethality, stealth, information, and design margin for modernization as key attributes for future platforms – providing warfighting commanders composable capabilities in increasingly contested environments across all phases of warfare.

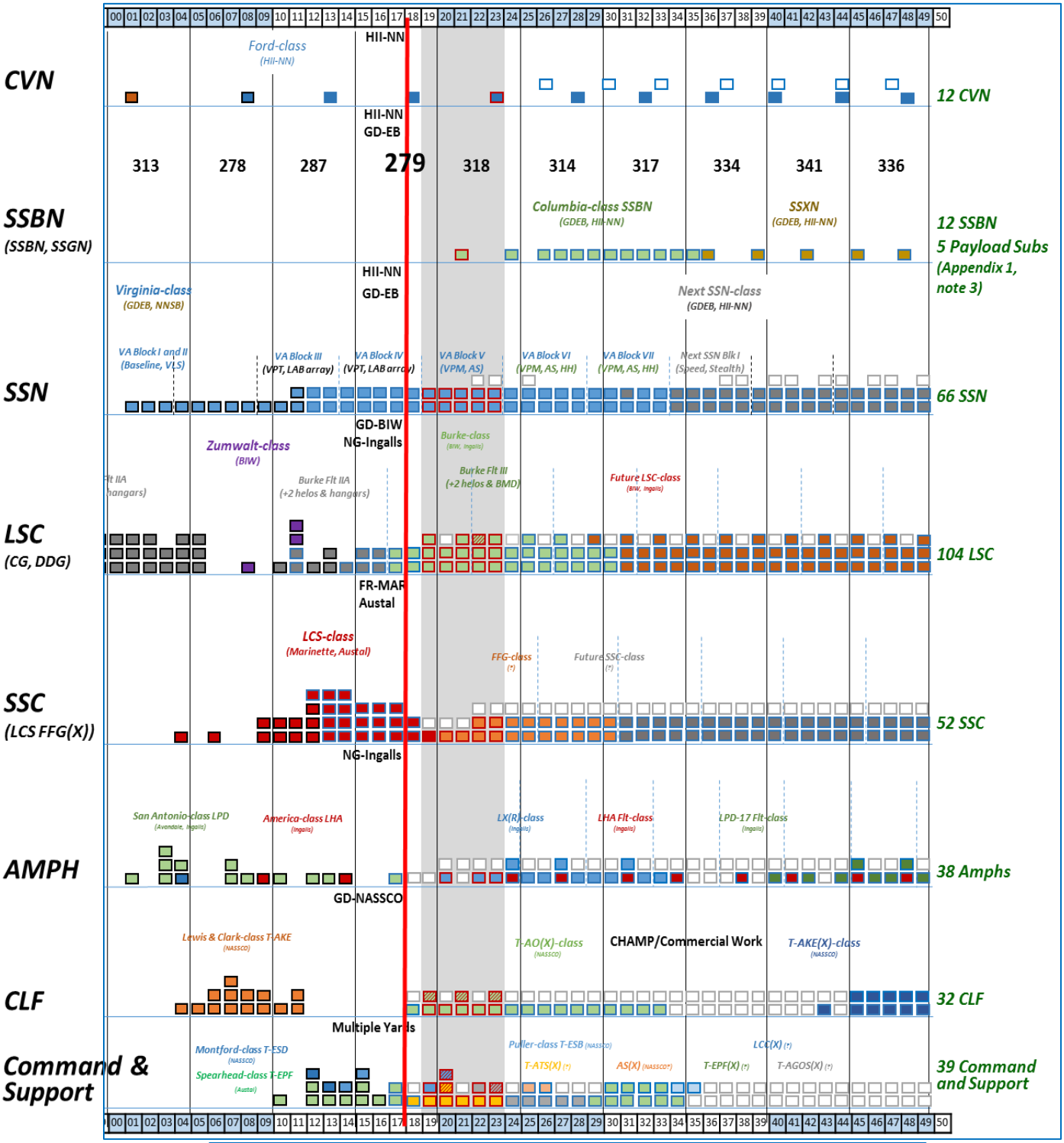
Aggressive Growth Opportunity

Although a plan to achieve today's warfighting requirement in three decades represents an unacceptable pace in context with worldwide evolving threats, it is a realistic plan that reflects the imperative to remain balanced across the NNN priorities in an era of unpredictable and restrictive funding levels. The most valuable feature of this plan is responsive scalability. By setting the conditions for an enduring industrial base as the top priority, the Navy is postured to respond to more aggressive investment in any year, which if received in all years could potentially attain the NNN warfighting target of 355 ships as early as the 2030s – balanced, credible and sustainable.

Figure A3-5 shows graphically the base 30-year plan featuring the steady shipbuilding profiles that must be sustained and properly managed. Of note, steady procurement profiles are most applicable to ship types with large requirements that demand continuous build rates to sustain force levels (SSN, LSC, SSC, etc.). These sustainment profiles are derived mathematically starting with the NNN requirement, divided by the notional ship life, to yield base procurements required per year to match steady-state retirements. These profiles will also grow the force until steady-state is achieved (the period of time that procurements exceed retirements). Classes such as CVNs attain a similar advantage by being procured on "centers" that balance stable shipyard workforce production and resources (the typical range is 3 to 5-yr centers). Ship classes such as Combat Logistics Force (CLF) and support ships, where the lower requirement results in excessive timeframes to achieve it using the math above, are procured to attain the requirement more quickly. The associated shipyard then moves to a different type of ship. This sector of the industrial base is more complex and carefully monitored, maintaining sustainment capacity with non-Battle Force ships or their own commercial ships. Accordingly, these profiles appear to be less stable.

The blocks with red borders in Figure A3-5 are those ships that are funded within the FYDP. Assessed extra industrial capacity is depicted by the white blocks layered in above the base plan. In the PB2019 FYDP, seven of these white blocks were filled in under "aggressive growth" and are depicted by red-hashed blocks. Left unchecked, more aggressive build rates (e.g. filling in more white blocks) can cause the total force level to temporarily exceed, or "overshoot" the requirement, and cause a "boom" shipbuilding period that would have to be properly managed by sustaining some level of follow-on base profiles to mitigate the subsequent "bust." Managing production to limit "overshoot" and avoid another boom and bust pattern will be important for stabilizing the industrial base long-term and preserving the desired efficiency and flexibility. In Figure A3-6 we attempt to show a range of profiles – admittedly simplifications – that endeavors to balance several competing variables that become better defined as we move down the timeline. The impact of "boom and bust" cycles is further addressed in Appendix 4.

Figure A3-5. Stable Procurement Profile
(Each block indicates individual ship procurement)



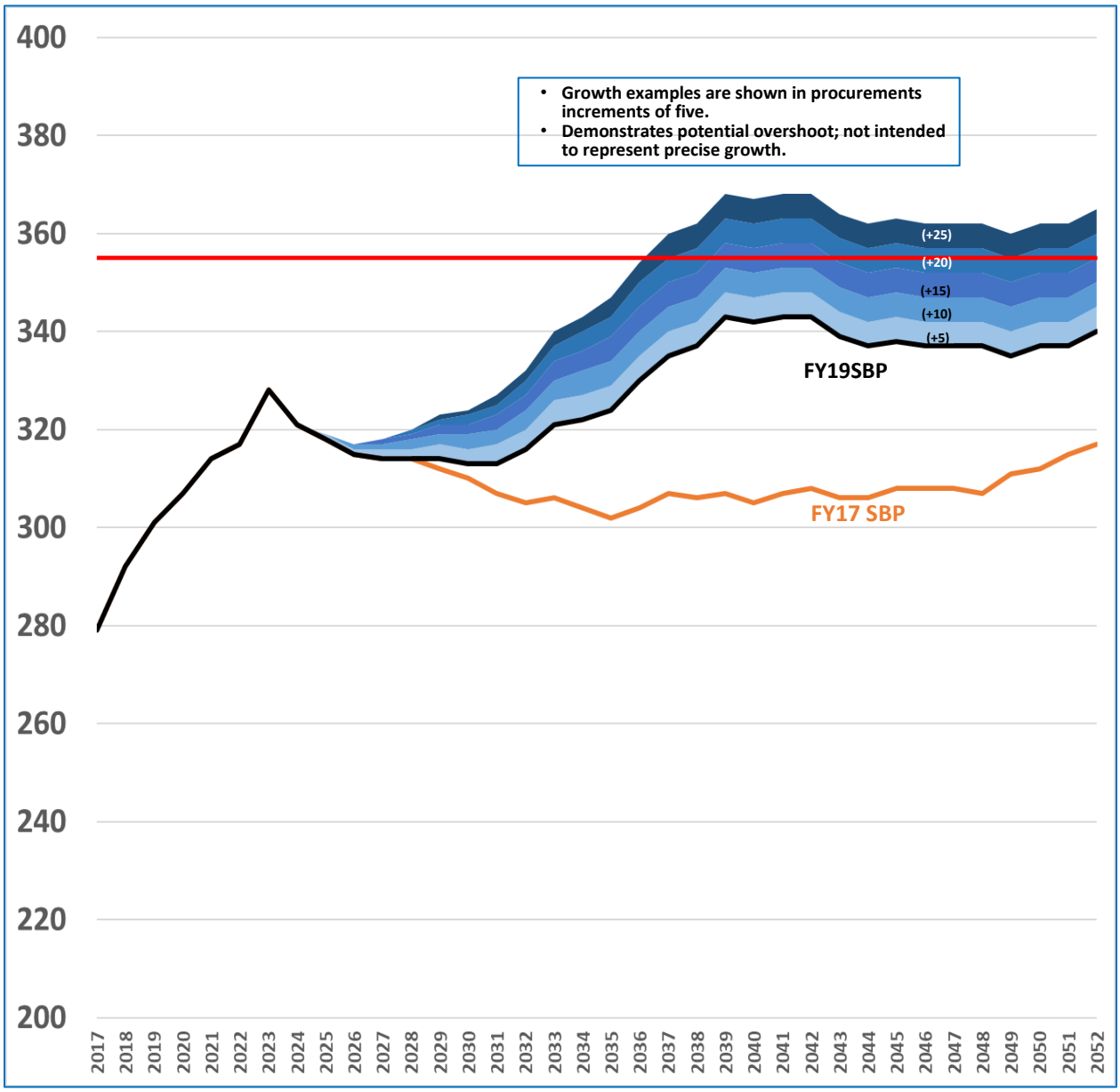
= Steady State Navy the Nation Needs (NNN) requirement
= Funded in PB19 to attain steady profile – red border
= Funded in PB19 above steady profile (aggressive growth) – hashed with red border
= Available shipyard capacity for additional aggressive growth
= 3.5-yr. CVN centers alternate profile. Accelerates achieving 12 ships to 2053.
= ship count; fielded minus inactivation middle of 5yr block

54 total FYDP ships added in PB19 submission (+11 above PB18)

Figure A3-6. Illustrating how different build rates can temporarily exceed requirements.

Aggressive Ramp Effect ("boom" period)

- FY19 shipbuilding plan (FY19SBP) reaches 355 in early 2050s, addressing inventory dips with SLEs and aggressive growth options, depending on growth factors (funding, capacity, etc.).
- Shows additional procurements in increments of +5, up to assessed max industrial capacity.
- LHA, LXR, DDG, SSN, and FFG must be balanced to keep correct warfighting mix.
- +20 additional procurements achieves 355 ships in the 2030s with significant overshoot (if procurement continues at the steady-state level following reaching the requirement).
- Less overshoot if production returns to a level below steady-state (potential "bust" period).



Appendix 4

Shipbuilding Industrial Base & the Boom/Bust Impact

The U.S. shipbuilding industrial base is unique and must be properly sustained. Over the previous five decades 14 defense-related new construction shipyards have closed, 3 have left the defense industry, and one new shipyard has opened. Today, the Navy contracts primarily with 7 private new construction shipyards to build our future Battle Force, which represents significantly less capacity than our principal competitors (figure A4-1). More recently, the impact of reduced Navy funding caused a parallel contraction of the sub-vendor sector and created an overall investment imbalance that favored limited shipbuilding over readiness, resulting in lapses in maintenance and operational proficiency. If faced with the demands of a major conflict it may be possible to engage other industries to assist, but the cost of such assistance is currently unquantifiable.

For historical context, the "boom and bust" profile of the last 60 years are shown in Figure A4-2. This profile shows sharp peaks in shipbuilding, followed by significant breaks – valleys – in production that severely degraded the ability to plan the long-term or respond in the near-term, devastated workforce experience and efficiency that is becoming increasingly more difficult to reconstitute, and contributed to significantly longer times to build ships with attendant significant cost growth. The significant buildup in the 1950s and 1980s, followed by "bust" periods of little production, led to significant instability and the loss of portions of our shipbuilding industrial base. The "boom" periods also eventually led to large-scale block obsolescence as types/classes of ships reached (or will reach) the end of their service lives simultaneously, ultimately driving the need for another "boom" to recover. Without a commitment to steady acquisition profiles, the now smaller industrial base will struggle to recover from future "boom/bust" cycles.

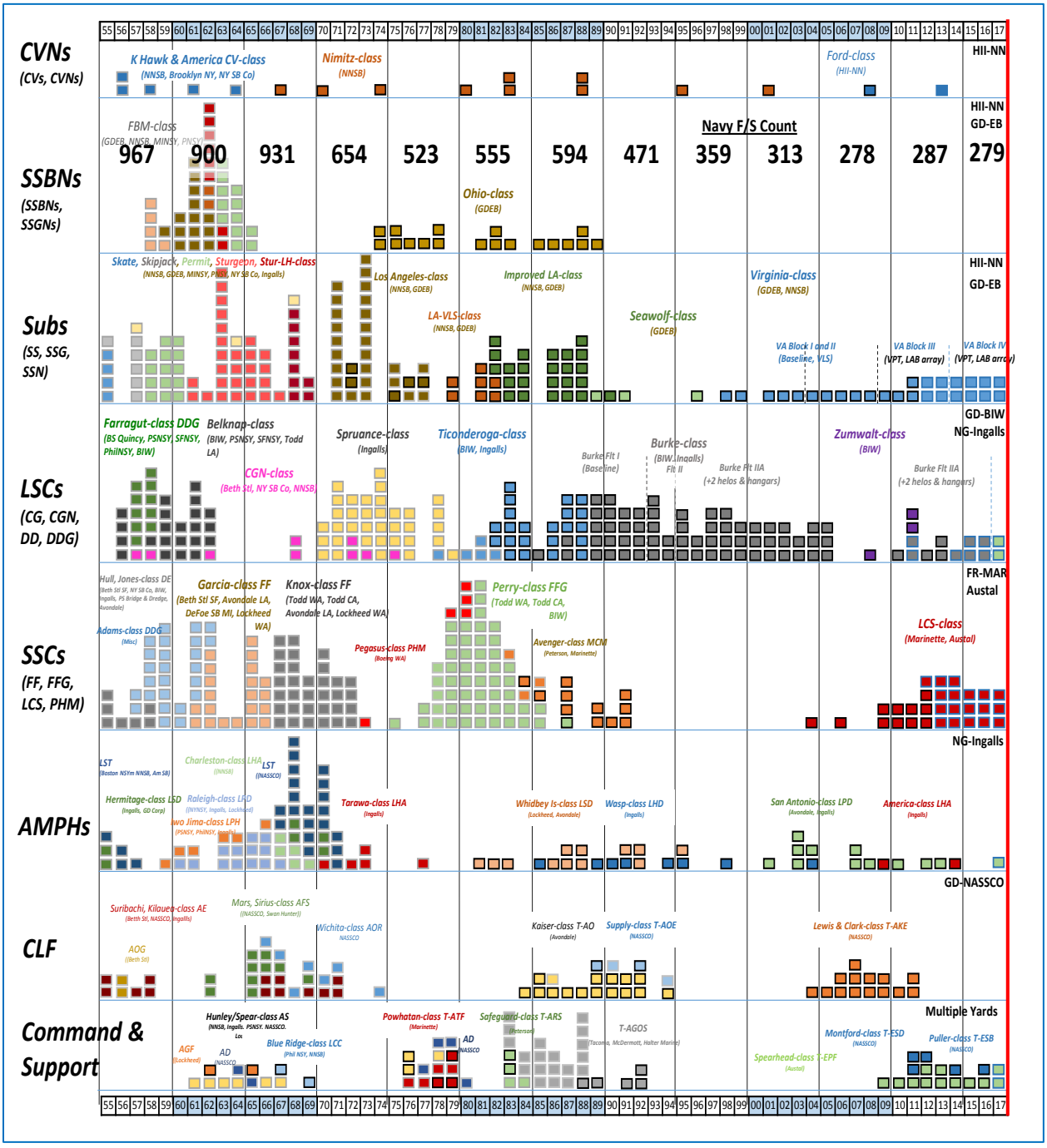
In contrast, the stable, affordable baseline shipbuilding profiles that must be protected to preserve our industrial base and establish an aggressive, forward looking, competitive posture are shown in Appendix 3. These baseline profiles feature a stable workforce to aggressively respond to NNN shipbuilding priorities, affording the opportunity to quickly adopt new capabilities, aggressively add capacity, plan and complete major modernization efforts, respond to emerging disruptive capabilities, or move to new platform designs.

Industry recognizes its critical role and has shown a strong desire to drive improved performance to meet Navy's needs. The Navy's role is to be a knowledgeable and demanding customer, to define the requirement, and to work with Congress to establish the foundational profiles to attain it. This should provide clarity and confidence that will inform industry investment in capital improvement and expansion, research and development, and a world-class workforce – the historically demonstrated key contributors to winning in any timeframe.

Figure A4-1. New Construction Industrial Base Reductions

Note: Other commercial shipyards may be future defense industry candidates.

Figure A4-2. Industrial Base Boom and Bust Cycles from 1955 to present.
(Each block indicates an individual ship procurement)



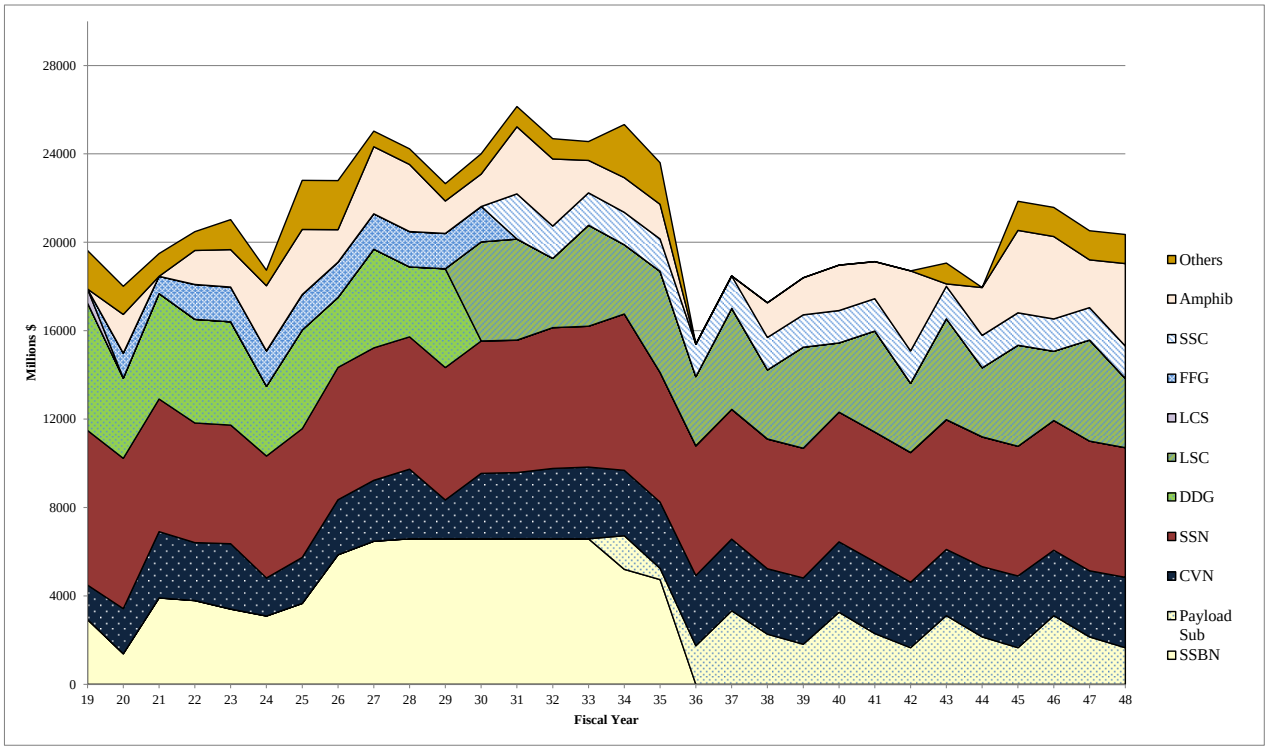
Appendix 5

Estimated Annual Ship Construction Funding Required for the Long-Range Shipbuilding Program

The funding in this report is in FY18 constant dollars using a 3.1 percent shipbuilding composite inflation rate (SCIR).[1] Figure A5-1 depicts the estimated funding required to achieve the inventories presented in Appendix 3, Table A3-4. Average ship construction funding across the FYDP is $19.7B per year. Beyond the FYDP, an average of $25B per year would be required to sustain the baseline stable acquisition profiles (shipbuilding priority #1), and also account for the serial production of the COLUMBIA Class SSBN. Exercising scalable "Aggressive Growth" options to take advantage of additional available industrial base capacity would come after that and would require additional ship-building funding. With a diligent approach to SLEs, strong industry response, and additional resources, 355 ships could be attained by the 2030s.

Total Ownership Cost (TOC) funding of sustaining a larger navy is in addition to shipbuilding funding, and phased with delivery of Battle Force ships (manning, support, training, infrastructure, etc.). TOC is included in the supporting accounts for anticipated FYDP deliveries.

Figure A5-1. Annual Funding Required for Navy Long-Range Shipbuilding Plan (FY2019-2048)



As required by the FY2016 NDAA, the graphical and tabular form of Figure A5-1, by ship class, is contained in a separate, limited distribution addendum to this report due to the business sensitive nature of the details.

[1] The shipbuilding composite inflation rate is a weighted average of shipbuilding costs across the shipbuilding industrial base. This inflation rate is developed using historic shipbuilding costs and projected future pricing for each shipyard. While historically it has been up to three percentage points higher than general inflation, this gap is projected to narrow to less than one percentage in the future.

Appendix 6

Planned Ship Decommissionings, Dismantlings, and Disposals during FY2019-FY2023 Future Years Defense Program (FYDP)

I. Introduction

This addendum report is in compliance with the Senate Armed Services Committee request for additional information regarding decommissioning and disposal of naval vessels.

II. Ships Planned for Decommissioning or to be Placed Out of Service during the FYDP

Table A6-l lists the Navy Battle Force ships to be decommissioned or placed out of service within the FYDP. The table also identifies the planned disposition for each ship. There are no potential gaps in warfighting capability that will result from the projected ships being removed from service.

Table A6-1. Ships Planned for Decommissioning or to be Placed Out of Service[1] during the FYDP

Inactivation Year (FY)	Ship Name	Disposition
2019 - 1 ship	USS PITTSBURGH (SSN 720)	Dismantle
2020 - 2 ships	USS OLYMPIA (SSN 717)	Dismantle
	USS LOUISVILLE (SSN 724)	Dismantle
2021 - 8 ships	USNS CATAWBA (T-ATF 168)	Dismantle
	USNS SIOUX (T-ATF 171)	Dismantle
	USNS APACHE (T-ATF 172)	Dismantle
	USNS WALTER S DIEHL (T-AO 193)	Dismantle
	USS PROVIDENCE (SSN 719)	Dismantle
	USS OKLAHOMA CITY (SSN 723)	Dismantle
	USS HELENA (SSN 725)	Dismantle
	USNS JOHN LENTHALL (T-AO 189)	Dismantle
2022 – 6 ships	USNS LEROY GRUMMAN (T-AO 195)	Dismantle
	USS CHAMPION (MCM 4)	Dismantle
	USS SCOUT (MCM 8)	Dismantle
	USS ARDENT (MCM 12)	Dismantle
	USS SAN JUAN (SSN 751)	Dismantle
	USS KEY WEST (SSN 722)	Dismantle
2023 – 4 ships	USNS PECOS (T-AO 197)	Dismantle
	USS ALBANY (SSN 753)	Dismantle
	USS PASADENA (SSN 752)	Dismantle
	USS CHICAGO (SSN 721)	Dismantle

Notes:
1. For the purposes of the report US Navy vessels are commissioned ships that are decommissioned and removed from active status. USNS vessels are non-commissioned vessels that are placed out of service.

III. Ships Planned for Dismantling and Disposal during the FYDP

As a result of the annual Ship Disposition Review conducted February 8, 2017, the Navy

plans to retire 21 Battle Force ships to the inactive inventory during the FYDP and remove 45 ships from the inactive inventory, 38 for dismantlement and 7 for fleet training exercises. Table A6-2 list ships slated to be dismantled within the FYDP with specific dates to be determined. Table A6-3 lists the 7 ships for fleet exercises to support SINKEXs during Rim of the Pacific (RIMPAC) and Valiant Shield training exercises.

Included in the 38 ships identified for dismantlement are the five Austin-class LPDs that are no longer needed in reserve for amphibious lift requirements. These ships will be removed from retention and stricken due to the assessed prohibitive cost to reactivate. Their average age is 47 years.

Table A6-2. Ships Planned for Disposal by Dismantling

Ex-TICONDEROGA (CG 47)	Ex-HAYES (AG 195)
Ex-INDEPENDENCE (CV 62)	Ex-BARRY (DD 933)
Ex-UNDERWOOD (FFG 36)	Ex-NAVAJO (ATF 169)
Ex-NICHOLAS (FFG 47)	Ex-DOYLE (FFG 39)
Ex-SAMUEL B ROBERTS (FFG 58)	Ex-YORKTOWN (CG 48)
Ex-MOBILE (LKA 115)	Ex-CANON (PG 90)
Ex-CHARLESTON (LKA 113)	Ex-KITTY HAWK (CV 63)
Ex-EL PASO (LKA 117)	Ex-CHARLES F ADAMS (DDG 2)
Ex-BOONE (FFG 28)	Ex- PONCE (AFSB(I) 15)
Ex-JOHN L HALL (FFG 32)	USS CHAMPION (MCM 4)
Ex-STEPHEN W GROVES (FFG 29)	USS SCOUT (MCM 8)
Ex-HAWES (FFG 53)	USS ARDENT (MCM 12)
Ex-THOMAS S GATES (CG 51)	USNS CATAWBA (ATF 168)
Ex-JUNEAU (LPD 10)	USNS WALTER S DIEHL (T-AO 193)
Ex-CLEVELAND (LPD 7)	USNS JOHN LENTHALL (T-AO 189)
Ex-DUBUQUE (LPD 8)	USNS SIOUX (ATF 171)
Ex-DENVER (LPD 9)	USNS APACHE (ATF 172)
Ex-NASHVILLE (LPD 13)	USNS LEROY GRUMMAN (T-AO 195)
Ex-JOHN F KENNEDY (CV 67)	USNS PECOS (T-AO 197)

Table A6-3. Ships Planned for use in Future Fleet Training Exercises

Ex-MCCLUSKY (FFG 4 1)	Ex-FORD (FFG 54)
Ex-CURTS (F'FG 38)	Ex-INGRAHAM (FFG 61)
Ex-RACINE (LST 1191)	Ex-DURHAM (LKA 114)
Ex-ST LOUIS (LKA 1 16)	

Appendix 7

Auxiliary Vessel Plan

I. Introduction

The 2018 NDAA directed inclusion of an Auxiliary vessel recapitalization plan. Auxiliary vessels are defined as any ship designed to operate in the open ocean in a variety of sea states to provide general support to either combatant forces or shore based establishments. These ships support sealift requirements as documented in the DoD's most current mobility study. Auxiliaries do not meet the definition of a Battle Force ship, and are not included in the ship count.

II. Sealift Background

Auxiliaries support DoD's requirement to meet sealift needs around the world as evaluated in the Mobility Capabilities Assessment-2018 (MCA-18). This study identified the requirement for the sealift fleet to support a capacity of 15.3 million square feet. The current fleet includes:

- 50 Surge roll-on/roll-off (RO/RO) vessels (15 Military Sealift Command and 35 Maritime Administration Ready Reserve Force)
- 15 Prepositioning roll-on/roll-off vessels (10 Maritime Prepositioning Force (MPF) and 5 Army Prepositioning)
- 10 Special Capability ships (crane, aviation logistics, and heavy lift)

Table A7-1 below indicates the age of the fleet, with most reaching end of service life before FY2040. 20 of these ships have been funded for service life extensions (SLE).

A7-1. Sealift Retirement Schedule

	Avg Age	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total
Crane (ACS)	50						1	2			2				1								6
Aviation Log (AVB)	48												1	1									2
Heavy Lift (SEABEE)	45													1	1								2
Surge Sealift (AK & AKR)	39								1	1	5		4	7	11	2	4	5	8			2	50
Total		0	0	0	0	0	1	2	1	1	7	0	5	9	13	2	4	5	8	0	0	2	60

III. Recapitalization

Maintaining sealift capacity levels over the next 30 years requires a mix of immediate and long-term actions. DON has developed a recapitalization strategy along with USTRANSCOM, MARAD, and other partners. The resulting strategy has three major elements:

- Service life extensions
- Acquiring used commercial vessels
- New-build construction at U.S. shipyards

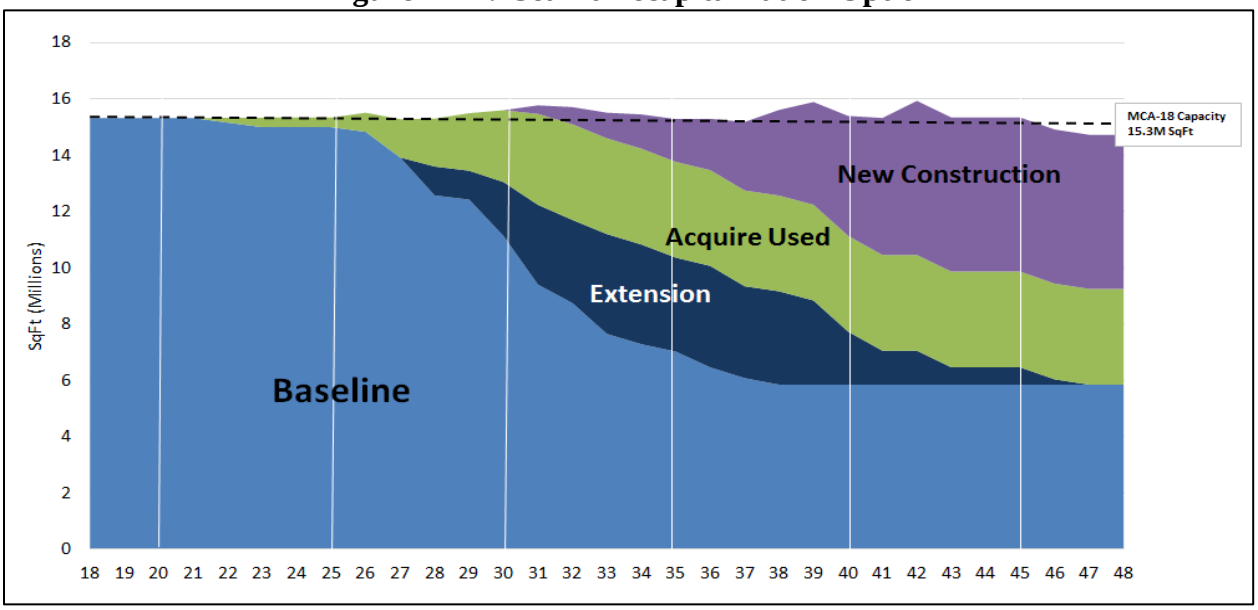
Service life extensions typically add approximately 10 years (from 50 years to 60 years). Extending service life is a short-term solution. Similar to the overall shipbuilding plan, maintaining

required levels of sealift relies upon a balanced combination of service life extension and acquiring new and used vessels.

Acquiring used commercial ships is the second element of maintaining sealift requirements. The 2018 NDAA authorizes procurement of two used vessels (the first will be in FY 21). Approximately 24 candidates have been identified, providing significant opportunity for growth in this area. DON will continue to work with Congress for authority to purchase more used vessels.

Finally, acquiring new ships is the ultimate long-term solution (50+ year ship life). Newly constructed vessels will be delivered first to the Maritime Prepositioning Force (MPF), strengthening the Fleet's ability to support employment across the full range of military operations. Replaced MPF vessels will in turn rotate into the sealift fleet, replacing older surge ships while sustaining capacity. Figure A7-2 shows a general plan for recapitalizing sealift capacity, measured in square feet.

Figure A7-2. Sealift Recapitalization Option



Profiles for new and used ships:

Fiscal Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	19-48
RO/RO New Construction										1		1	1	1	1	1	2	2	2	2	2	2									18
Used RO/RO Procurement			1	1			2	4	2	2	3	4	1																		20
Crane Ship Procurement						1	2			2			1																		6

IV. Funding: Funding is programmed in PB19 to begin the development of a common-hull program. Costs for the procurement of these ships will be provided when available.