DEPARTMENT OF DEFENSE

National Guard and Reserve Equipment Report for Fiscal Year 2022

MARCH 2021

NATIONAL GUARD AND RESERVE EQUIPMENT REPORT FOR FISCAL YEAR 2022

(NGRER FY 2022)

(In Accordance with Section 10541, Title 10, United States Code)

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PERSONNEL AND READINESS

FOREWORD

The Department of Defense (DoD) fulfills its mission to defend the nation and address accelerating global challenges with Reserve Component (RC) units and personnel activated to advance American interests through deployments around the world. Additionally, RCs respond to natural disasters and civil unrest, and provide coronavirus disease 2019 pandemic support. The RC continues to modernize its military capabilities in order to respond as an operational force for planned rotations and short notice activations.

RCs must man, equip, sustain, and train their units to successfully accomplish this wide-ranging mission set. Progress on Active and RC interoperability continues as the DoD focuses much of its investment resources on leap-ahead technologies. The Department must consider enabler capabilities and capacities that primarily reside in the RC as the DoD builds the future force required to fight and win. This necessitates Reserve forces possess lethality, networking, and force protection similar in capability and compatibility to the Total Force. An equipping process that balances investment between technologically advanced weapon systems and strategic legacy enablers increases interoperability and decreases operational risk.

The report describes the strides DoD is making to achieve a well-balanced, seamlessly integrated, and capabilities based Total Force. Chapter one reviews the RC equipping process. Progress is underway towards equipment budget transparency and auditability of appropriated procurement resources. As envisioned, RC budget transparency efforts empower increased confidence in senior leader decision making; enable Congress to fulfill oversight responsibilities; and provide the Chief, National Guard Bureau (CNGB) data necessary to perform required equipment certification.

Chapters two through six provide detailed narratives and data for each RC for Fiscal Year (FY) 2022 through FY 2024. The narratives describe the current equipping status of each RC and their future procurement plans. Equipping Guard and Reserve forces is essential to fulfill the broad range of domestic challenges the nation faces, as well as meet obligations to the Total Force. The Services highlight that directed appropriations, including the eleven P-8A Poseidon aircraft to the Navy Reserve and eight C-130 Hercules aircraft to the Air Guard and Air Force Reserve, fulfill critical shortages, modernize equipment, and improve readiness immeasurably.

The RCs are grateful for the strong support provided by our Nation's elected representatives. This advocacy reflects the positive impact the RCs have on their communities, the nation and countries throughout the world.

Sincerely,

Virginia S. Penrod

Virginia S. Penrod
Acting

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Chapter 1
Overview

I. Introduction

Over the past year, National Guard and Reserve units experienced the largest sustained activations since the peak of support to Iraq and Afghanistan. Reserve Component (RC) units activated for deployments around the globe including ongoing contingency and force protection missions; responded to natural disasters and civil unrest; and were activated to support relief missions for the COVID-19 pandemic. They continue to stand ready to support civil authorities and to respond as an operational force for both planned rotations and short notice activations.

To successfully accomplish this wide-ranging mission set, RCs need the resources required to man, equip, sustain, and train their units. For operational missions, RCs often need to be able to deploy quickly and then seamlessly assimilate with active units. This requires that RCs have dedicated equipment that is interoperable and compatible with Active Component (AC) systems. Progress on AC/RC interoperability must continue even as the Department of Defense (DoD) focuses much of its investment resources in leap-ahead technologies. As DoD builds the future force required to fight and win, enabler capabilities and capacities that primarily reside in the RC must still be taken into account. It is important the RCs receive timely funding to meet requirements for current technology. An equipping process that balances investment between technologically advanced weapon systems and strategic legacy enablers will increase interoperability and decrease operational risk.

During his confirmation hearing, Secretary of Defense Lloyd Austin stated his objective to work with the Military Services to invest in capabilities that will make the RC relevant in the future fight and continue to close the gap between RC and AC equipment capabilities.

P**rocesses for Equipping Reserve Components**: DoD's current method for equipping and modernizing the RCs relies on procurement appropriations; redistribution (cascading); and, Congressional provisions, including the National Guard and Reserve Equipment Appropriation (NGREA) and specific directed appropriations.

Procurement Appropriations. Each parent Military Service administers equipment procurement decisions. Parent Military Services submit requests for RC procurement appropriations. The procurement request (P-1) reflects the Department's combined request for the AC and RC. The P-1R is a manually updated subset to the P-1 budget exhibit and contains the parent Military Services' procurement budget request for the RC.[1]

[1] DoDD 1200.17, *Managing the Reserve Components as an Operational Force, October 29, 2008 and* DoDI 1225.06, *Equipping the Reserve Forces*, Incorporating Change 1, November 30, 2017 require the Secretaries of the Military Departments to manage their respective RCs as an operational force such that the RCs provide operational capabilities while maintaining strategic depth to meet U.S. military requirements across the full spectrum of conflict. To fulfill assigned missions, the RCs of each Military Department shall be consistently and predictably equipped. Further, RC resourcing plans shall ensure visibility to track resources from formulation, appropriation, and allocation through execution.

Redistribution (Cascading). Historically, the RC allocation of defense appropriations for equipment procurement, including congressional adds, makes up less than 8 percent of the total defense allocation (see Figure 1-1).[2] Rather than new procurement, the Military Services rely on a redistribution model commonly referred to as "cascading"—redistributing legacy items into RC units as new equipment is delivered to the AC—to equip their respective RCs.

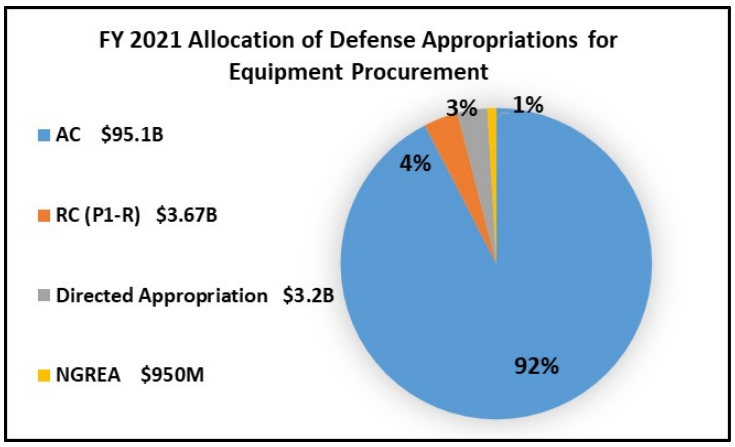

Figure 1-1. FY 2021 Allocation of Defense Appropriations for Equipment Procurement

II. Scope of the Report

The National Guard and Reserve Equipment Report (NGRER), required by section 10541 of title 10 U.S.C., identifies major items of equipment in the RC inventories that are important to the Services, DoD, and Congress. The NGRER also outlines how that equipment is acquired and disposed of by the RCs for the budget year and the two succeeding years. Data on equipment included in the report consists of high-value, mission-essential equipment requirements, critical equipment shortages, Service procurements, and supplemental funding for the RC.

The FY 2008 National Defense Authorization Act (NDAA) directed new equipment reporting requirements for the National Guard's capability to perform its federal responsibilities in response to an emergency or major disaster. Appendix A highlights this guidance in its entirety and the National Guard Bureau responds to the requirements in Appendix B.

The FY 2019 NDAA amended Section 10541(b) of title 10 U.S.C. by adding the requirement for a joint assessment by the Chief of Staff of the Army (CSA) and the CNGB on the efforts of the Army to achieve equipment and capability parity among the AC, the Army Reserve (USAR), and the ARNG. The assessment includes a comparison of the inventory of high priority items of equipment, including AH–64 Attack Helicopters; UH–60 Black Hawk Utility Helicopters; Abrams Main Battle Tanks; Bradley Infantry Fighting Vehicles; Stryker Combat Vehicles; and any other items of equipment identified as high priority by the CSA or the CNGB.

The four charts in this section present a broad overview of previous major items reported in the NGRER, major item shortages in dollar amounts, and the recent tracking through the current budget year of procurement funding for the RC. These introductory tables are summary and historical in nature and do not indicate the comprehensive dollar requirement required to fully

[2] P-1 & P-1R values do not include Ammunition appropriations. P-1 values include only appropriations displayed in P-1R: Army: Aircraft, Missile, W&TCV, and Other Procurement, Navy & Air Force: Aircraft, Other Procurement, and Marine Corps. The directed appropriation figure of $3.2B reflects the appropriations for nine P-8A for USNR, eight C-130 aircraft for AFR and ANG, and HMMWV modernization. The NGREA figure of $950M is in addition to the $3.2B of directed appropriations.

fund Reserve capabilities. Where appropriate, detail on potential costs, such as modernization of existing systems, is contained in the chapters of the respective individual RC.

RC inventories include thousands of different types of equipment. The FY 2022 NGRER highlights 797 major equipment types. This report presents the results of analysis of RC inventories based primarily on the dollar value of the equipment, which allows the aggregation, comparison, and summary of diverse types of equipment. The procurement costs are from the Services' official data and are either the latest procurement cost adjusted for inflation or the current replacement cost.

Chart 1-1 shows the number of types of equipment included in previous NGRERs to Congress. These numbers are provided for perspective and comparison with previous reports and do not represent the entire inventory of RC major items.

Chart 1-1. Items of Equipment Reported in Recent NGRERs

Reserve Component	FY 2017 NGRER	FY 2018 NGRER	FY 2019 NGRER	FY 2020 NGRER	FY 2021 NGRER	FY 2022 NGRER
ARNG	261	243	309	309	295	274
USAR	322	390	236	167	180	176
MCR	183	168	165	157	156	190
USNR	36	30	33	31	31	35
ANG	26	27	26	24	23	16
AFR	17	15	14	14	14	23
CGR	71	70	71	72	76	83
Total	916	943	854	774	775	797

III. Equipment Shortages

Chart 1-2 shows the dollar value of the current total major equipment requirements and inventories for each RC. The information in this table identifies requirements for new procurement for the RC, but does not show capabilities, shortfalls, or compatibility mismatch with the AC caused by modernization requirements.

The ARNG and USAR equipment shortage costs depicted in Chart 1-2 show the cost based on requirements and on-hand inventories without recognition of authorized substitutes, per Congressional guidance. The ARNG reports a $10.3 billion total shortage and the USAR reports a shortage cost of $4.7 billion. More information on the Army's equipping strategy and their use of authorized substitutions can be found in Chapter 2, Section I of this report.

The Marine Corps Reserve (USMCR) reports a $1.5 billion shortage of its major items, but is equipped to a home station training allowance only. More information on the Marine Corps (USMC) equipping strategy and the USMCR's use of a training allowance can be found in Chapter 3 of this report.

The Navy Reserve (USNR) reports a $5.5 billion shortage of equipment. Following the 2018 audit readiness review, the Navy refined its processes for accurately calculating equipment shortage values, which has led to a more accurate and consistent estimate. More information on the Navy's equipping status can be found in Chapter 4 of this report.

The Air Force Reserve (AFR) shortage cost of major equipment is approximately $1.2 billion. The Air National Guard (ANG) reports a shortage of approximately $5.4 billion. More information on the Air Force's equipping strategy can be found in Chapter 5 of this report.

Chart 1-2. Beginning FY 2021 Reserve Component Equipment Shortages

Reserve Component	Requirements ($M)	On-hand ($M)	Shortage ($M)	Shortage (% of Reqd $)
ARNG	98,042.00	87,702.00	10,339.00	10.5%
USAR	31,534.00	26,837.00	4,697.00	14.9%
MCR	11,771.50	10,226.30	1,544.70	13.1%
USNR	7,818.20	2,360.40	5,457.80	69.8%
ANG	60,860.2	56,333.4	4,526.8	8.0%
AFR	22,853.60	21,685.80	1,167.80	5.1%
CGR	206.60	204.60	2.00	1.0%
Total	233,086.10	205,349.10	27,735.10	17.5%

Note: Requirements, on-hand, and shortage entries are total equipment value, excluding authorized substitutes per Congressional guidance.

IV. Equipment Procurement

The RC procurement funding levels for the period FY 2009–FY 2020 are provided in Chart 1-3. The RC portion of the base Military Service procurement funding is provided in the Service Procurement Programs–Reserve Components (P-1R), a budget exhibit in the annual defense budget request. Chart 1-3 shows the updates the P-1R values have received for past fiscal years as each new budget request was released. The P-1R funding for a given fiscal year appears in three successive budget requests, first as the original budget request, then as P-1R updates in two successive budget requests. The P-1R updates for a fiscal year reflect changes to the original request that may increase or decrease the procurement funding intended for the RCs. Those changes should include the actual appropriation enacted, including supplemental funding and reprogramming actions.

Chart 1-3 reflects the total RC P-1R and NGREA funding over the past decade. Chart 1-4 shows the trend of the percentage of DoD procurement levels for RCs in recent years.

Chart 1-3. Reserve Component Procurement Funding

FY	Procurement Funding Source	RC Procurement Funding ($M)							
		ARNG	AR	USMCR	USNR	ANG	AFR	Total	Grand Total
2012	President's Budget P-1R (PY)	3,262.2	968.0	8.5	170.1	315.9	190.6	4,915.3	
	NGREA	320.3	145.0	63.0	75.0	315.0	75.0	993.3	
	Total	**3,582.4**	**1,113.0**	**71.5**	**245.1**	**630.9**	**265.6**		**$5,908.6**
2013	President's Budget P-1R (PY)	1,643.9	667.0	19.2	376.1	276.8	310.9	3,293.9	
	NGREA	460.0	240.0	120.0	90.0	455.0	130.0	1,495.0	
	Total	**2,103.9**	**907.0**	**139.2**	**466.1**	**731.8**	**440.9**		**$4,788.9**
2014	President's Budget P-1R (PY)	1,952.1	382.0	59.0	187.8	231.9	696.6	3,509.3	
	NGREA	315.0	175.0	60.0	65.0	315.0	70.0	1,000.0	
	Total	**2,267.1**	**557.0**	**119.0**	**252.8**	**546.9**	**766.6**		**$4,509.3**
2015	President's Budget P-1R (PY)	1,851.2	551.8	59.1	145.3	361.4	254.8	3,223.5	
	NGREA	415.0	185.0	60.0	65.0	415.0	60.0	1,200.0	
	Total	**2,266.2**	**736.8**	**119.1**	**210.3**	**776.4**	**314.8**		**$4,423.5**
2016	President's Budget P-1R (PY)	1,929.0	431.2	51.4	257.4	269.0	54.6	2,992.6	
	NGREA	330.0	140.0	10.0	50.0	330.0	140.0	1,000.0	
	Total	**2,259.0**	**571.2**	**61.4**	**307.4**	**599.0**	**194.6**		**$3,992.6**
2017	President's Budget P-1R (PY)	1,953.5	417.7	32.6	394.1	260.5	83.3	3,141.8	
	NGREA	247.5	105.0	7.5	37.5	247.5	105.0	750.0	
	Total	**2,201.0**	**522.7**	**40.1**	**431.6**	**508.0**	**188.3**		**$3,891.8**
2018	President's Budget P-1R (PY)	2,258.4	358.3	32.8	683.3	260.5	83.3	3,676.6	
	NGREA	429.0	169.0	13.0	65.0	429.0	195.0	1,300.0	
	Total	**2,687.4**	**527.3**	**45.8**	**748.3**	**689.5**	**278.3**		**$4,976.6**
2019	President's Budget P-1R (PY)	2,427.4	539.7	140.5	311.6	273.0	65.5	3,757.7	
	NGREA	421.0	180.0	13.0	65.0	421.0	200.0	1,300.0	
	Total	**2,848.4**	**719.7**	**153.5**	**376.6**	**694.0**	**265.5**		**$5,057.7**
2020	President's Budget P-1R (PY)	3,132.1	423.0	141.4	683.3	176.1	62.0	4,618.0	
	NGREA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total	**3,132.1**	**423.0**	**141.4**	**683.3**	**176.1**	**62.0**		**$4,618.0**
2021	President's Budget P-1R (CY)	2,192.0	425.3	54.6	528.0	364.9	113.9	3,678.7	
	NGREA	285.0	155.0	17.5	52.5	285.0	155.0	950.0	
	Total	**2,477.0**	**580.3**	**72.1**	**580.5**	**649.9**	**268.9**		**$4,628.7**
2022	President's Budget P-1R (R)								
	NGREA								
	Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		**$0.0**

Note 1: P-1R values reflect latest FY update in President's Budget. R: Request; CY: Current Year; PY: Prior Year.
Note 2: The above figures do not include Ammunition procured for the RC.
Note 3: USNR figures include USMCR aircraft procurement funds.
Note 4: 2011-2013 NGREA reduced by $16.9M FY 2013 Sequestration Reduction.
Note 5: $1.3B of FY2020 NGREA was reprogrammed by DoD.
Note 6. 2022 P-1R values will not be available until FY 2022 President's Budget request is released.

Chart 1-4. Total Active and Reserve Component Procurement Funding

FY	P-1 Total ($M)	AC Total ($M)	RC Total ($M)	RC %	PRESBUD P-1 & P-1R Funding Source
2003	54,187.0	52,202.6	1,984.4	3.7%	Prior-Year
2004	55,685.8	54,188.3	1,497.5	2.7%	Prior-Year
2005	71,951.7	70,022.9	1,928.8	2.7%	Prior-Year
2006	75,380.8	72,701.4	2,679.4	3.6%	Prior-Year
2007	101,308.4	93,414.8	7,893.6	7.8%	Prior-Year
2008	125,306.0	119,191.7	6,114.3	4.9%	Prior-Year
2009	98,081.3	89,915.2	8,166.1	8.3%	Prior-Year
2010	97,601.1	92,150.5	5,450.6	5.6%	Prior-Year
2011	92,146.2	86,331.0	5,815.2	6.3%	Prior-Year
2012	81,205.3	76,289.9	4,915.3	6.1%	Prior-Year
2013	68,465.1	65,171.1	3,293.9	4.8%	Prior-Year
2014	67,496.4	63,987.1	3,509.3	5.2%	Prior-Year
2015	69,700.3	66,476.8	3,223.5	4.6%	Prior-Year
2016	80,285.0	77,292.4	2,992.6	3.7%	Prior-Year
2017	83,050.0	79,886.2	3,163.9	3.8%	Prior-Year
2018	98,820.5	95,143.9	3,676.6	3.7%	Prior-Year
2019	99,433.3	96,299.3	3,134.0	3.2%	Prior-Year
2020	99,393.5	95,106.6	4,286.9	4.3%	Prior-Year
2021	98,753.2	95,073.8	3,679.4	3.7%	Current Year
2022					Request

Note 1: P-1 and P-1R values reflect latest FY update in President's Budget (Request, Current Year, or Prior Year).
Note 2: P-1 & P-1R values do not include Ammunition appropriations.
Note 3: P-1 values include only appropriations displayed in P-1R:
Army: Aircraft, Missile, W&TCV, and Other Procurement
Navy & Air Force: Aircraft, Other Procurement, and Marine Corps.
Note 4: FY 2022 P-1 and P-1R values will not be available until FY 2022 President's Budget is passed.

V. Reserve Component Equipping Challenges

This section briefly summarizes the principal equipping concerns of each RC. The components' individual chapters treat these subjects in more detail.

A. Army National Guard (ARNG)

The ARNG continues to make significant investments in modernization, in accordance with the 2018 National Defense Strategy to prepare for Multi-Domain Operations in the future. The ARNG is fully partnering and collaborating with the AC while making these investments to maintain readiness, capability, and interoperability. The ARNG maintains visibility of critical

weapon systems and aviation platforms using the Army's joint assessment of parity (see Appendix D).

The ARNG's top focus areas are:

- Ensuring that ARNG equipment is interoperable, deployable, and sustainable
- Completing Blackhawk helicopter modernization
- Ensuring mission command system interoperability with the Regular Army and the Joint Force
- Reinvesting in Engineer and mobility equipment
- Modernizing Critical Dual Use equipment to support domestic operations and contingency missions
- Maintaining modernization in soldier systems with Regular Army across ARNG.

Chapter 2, Section II of this report provides a more detailed discussion of these focus areas.

B. Army Reserve (USAR)

The USAR remains committed to achieving readiness objectives that allow seamless integration with the Total Force. The Army equipment modernization strategy is focused on developing next generation combat vehicles, aerial platforms, network communications, precision fires, and Soldier systems. Enabler capabilities and capacities will also need to evolve for the Army to achieve transformation goals required to fight and win on a complex battlefield against near-peer competitors. Aging critical equipment must be replaced or recapitalized to preserve overmatch and ensure development of future capabilities.

The top USAR focus areas are:

- Resourcing: Optimize processes and prioritization to deliver modern enabler capabilities that support Multi-Domain Operations, including risk-informed divestiture of legacy equipment
- Readiness: Invest in responsive capabilities to enhance equipping posture for day-to-day competition, large-scale combat operations, Homeland Defense, and Defense Support of Civil Authorities
- Modernizing: Advocate for the development of future enabler capabilities to accelerate interoperability and holistically identify/forecast resource gaps.

Additional information about the USAR focus areas can be found in Chapter 2, Section III of this report.

C. Marine Corps Reserve (USMCR)

The role of the USMCR has evolved from a strategic capability to an operational and strategic capability. USMCR provides forces for preplanned, rotational, and routine combatant commander and Military Service requirements. The demand for unique capabilities within the USMCR continues to increase, requiring more RC activations of units and ad hoc formations to produce enabling capabilities across the range of military operations. Without concurrent fielding

and RC equipment fielding prioritization on plane with AC prioritization, full compatibility between AC and RC equipment is not possible.

The USMCR's top focus areas are:

- Major Ground Equipment Modernization (JLTV, Amphibious Combat Vehicle (ACV)). The USMC is acquiring major ground equipment modernizations that will provide the RC with the latest generation of warfighting capabilities.
- F-5N/F+ Block Upgrades.
- Aviation and Ground Equipment Maintenance. Delayed fielding increases equipment compatibility challenges and results in a requirement to concurrently maintain both new and legacy equipment, increasing costs and negatively affecting overall readiness.

A more detailed discussion of these challenges can be found in Chapter 3, Section II of this report.

D. Navy Reserve (USNR)

As part of the Navy Total Force, USNR sailors provide operational capabilities, strategic depth, and the capacity to surge quickly. The USNR continues to strive for AC and RC equipment compatibility to maintain strategic depth. Achieving equipment compatibility with the AC is critical to USNR efforts to ensure the RC has the ability to train to the same standards as, and seamlessly operate with, AC counterparts.

To ensure the USNR can support AC requirements, they need dedicated funding for future investments in USNR hardware.

The top USNR focus area is AC/RC compatibility. This includes:

- Keeping RC aircraft recapitalization on pace with AC recapitalization
- Modernizing key RC capabilities to increase lethality and agility
- Investing in Expeditionary Logistics in support of Distributed Maritime Operations.

Chapter 4, Section II of this report provides a more detailed discussion of these challenges.

E. Air National Guard (ANG)

The ANG's modernization efforts center on continuously improving readiness and improving capability to support future combat and domestic operations. However, because the ANG operates and maintains the oldest aircraft in the Air Force inventory, it faces significant challenges to increasing aircraft availability.

ANG priorities include:

- Testing and fielding F-16 Active Electronically Scanned Array radar
- Improving C-130H propulsion
- Acquiring C-130J support equipment
- Implementing mobile/deployable Remotely Piloted Aircraft detect and avoid capability

- Updating multi-mission design series Real-time Information in the Cockpit for KC-135, C-17, and C-130J Aircraft.

Chapter 5, Section II of this report provides additional information about ANG equipment challenges.

F. Air Force Reserve (AFR)

The AFR is solidifying readiness gains and continuing prioritized, cost-effective modernization. Through past years, the AFR was forced to stretch fiscal appropriations, deferring aircraft modernization, infrastructure upgrades, and equipment purchases. While the AFR has made gains in restoring readiness, modern technology has expanded warfighting into new domains and increased reliance on integrated systems. To retain military advantage and to guard against new threats, the AFR must keep pace with the current rapid rate of technological development.

The top equipment focus areas for AFR are:

- Modernizing aircraft to maintain readiness and compatibility to support combatant commanders
- Addressing how diminishing manufacturing sources negatively impact the necessary repair capability to maintain readiness
- Reprioritizing vehicles and support equipment that have been chronically underfunded to accommodate other modernization efforts
- Updating training simulators to keep pace with aircraft modernization and force structure changes to produce mission ready aircrew
- Acquiring occupational health and safety equipment to ensure compliance with safety standards and practices.

Chapter 5, Section II of this report provides a more detailed discussion of these challenges.

G. Coast Guard Reserve (CGR)

Predictable and steady funding is critical to sustain CGR operational integration, which is essential to responding to contingencies and fulfilling the nation's security demands. As the CGR pursues replacement of its aging boat platforms, weapons, and other equipment, they will require additional training to become proficient and maintain operational readiness.

This year, the top CGR focus areas are:

- Recapitalization of Personal Protective Equipment
- Obtaining sufficient training capacity to ensure proficiency on updated platforms.

Chapter 6, Section II of this report contains more information about the CGR equipping challenges.

Chapter 2
Equipping the Total Army

"Army must continue its push to increase readiness, improve its strategic mobility, and focus on modernization or risk losing the next war."

- Secretary of the Army Ryan McCarthy, October 2019 Association of the United States Army

I. Army Overview

A. Army Planning

The Army's central equipping challenge is the balance between current readiness and future readiness. Current readiness requires *readiness at echelon* to fulfill the combatant commander's requirements throughout the spectrum of Competition, Crisis, and Conflict. Future readiness requires *transformational change* to achieve overmatch and positional advantage by 2028.

The 2018 Army Strategy establishes four lines of effort, with specific objectives, to chart a path of irreversible momentum towards 2028. These lines of effort are **Readiness**, **Modernization**, **Reform**, and **Alliances and Partnerships**. Underpinning this strategic approach is an enduring commitment to take care of **People First** using 21st Century Talent Management and by living the Army Values.

While proceeding along all four lines of effort simultaneously, Army will continue to balance readiness and modernization, using the Regionally Aligned Readiness and Modernization Model (ReARMM) to modernize while retaining warfighting readiness. Using ReARMM across total Army formations in 2021, the Army will prioritize and synchronize organizational design changes and equipment fielding to support modernization, enable habitual relationships to specific missions and theaters, and win in competition and conflict.

B. The Army Equipping Guidance

The 2019 Army Modernization Strategy[1] describes how the Total Army (Regular Army, National Guard, Army Reserve, and Army Civilians) will transform into a multi-domain force by 2035, meet its enduring responsibility as part of the Joint Force to provide for the defense of the United States, and retain its position as the globally dominant land power. The Army's modernization approach will continue to test and refine operating concepts, draw on emerging technologies, and anticipate changes in the operational environment.

The Army modernization effort focuses on strategic readiness and force projection.[1] These efforts prioritize investments to fill the most critical gaps for Large Scale Combat Operations (LSCO), set conditions for the Multi-Domain Operations (MDO)-capable force, and develop solutions to the Army's modernization priorities.

[1] The 2019 Army Modernization Strategy can be accessed at https://www.army.mil/e2/downloads/rv7/2019_army_modernization_strategy_final.pdf

Together, unit readiness (manning, organization, training, equipment, leadership) and force projection (global posture, set the theater, mobilization, deployment, employment, sustainment, redeployment) define strategic readiness and remain the Army's priority. The Army will not sacrifice its near-term capabilities.

Strategic readiness requires an agile Army, postured for and capable of global force projection. An Army that can compete with, deter, and defeat threats from near-peers to non-State actors in both conventional and asymmetric warfare. The Army Modernization Strategy states that the Army is to sustain a sufficient level of tactical readiness, build strategic readiness, and deliver the six modernization priorities and other modernization efforts.

The Army Modernization Strategy framework communicates how the Army must continuously modernize "how we fight, what we fight with, and who we are." The Army must prioritize which capabilities are vital to build the MDO-capable force and deter near-peer adversaries with constrained resources. Modernization efforts include delivering Cross Functional Teams, optimizing the force structure, reducing critical capability gaps for LSCO, and maturing doctrine in support of next generation capabilities. The combination of sustaining operational readiness, enhancing strategic readiness, and successfully fielding the MDO AimPoint Force are the Army's primary focus.

C. The Army's plan to fill Mobilization shortages in the Reserve Components

1. Equipping Units for Their Missions

The Army is committed to equipping and modernizing the Total Force based on mission and available resources, and has focused efforts on deploying units to ensure Soldiers committed to combat are prepared and equipped properly regardless of component. The Army will continue to equip and modernize the Total Army in accordance with established priorities and available funding.

2. Increasing Readiness by Redistributing Equipment

The Army fills shortages within the Reserve Component (RC) as part of the Total Force according to Army priorities. Current and planned operations/missions are prioritized to inform fielding across the Army, in line with the National Defense Strategy (NDS).

a. Mission Focused Equipment

The Army operationalizes the RC by leveraging the capabilities of the Army National Guard (ARNG) and the U.S. Army Reserve (USAR) forces, to support early- and mid-deploying forces identified in War Plans. ReARMM will provide a framework to assess unit readiness based on directed levels required to perform regionally aligned geographical combatant command missions.

b. Readiness Redistribution

A deliberate equipment redistribution review process ensures the right equipment is in the right place. The Army is committed to meeting Department of Defense Instruction 1225.06

(Equipping the Reserve Forces) requirements to pay back ARNG and USAR equipment transferred from the Reserve Forces with fully capable equipment.

c. Efficiency

The Army seeks to streamline the sustainment process to ensure the most efficient utilization of sustainment resources. As such, the Army must divest older systems and excess equipment on-hand (EOH), while ensuring equipment distribution and redistribution is accomplished at the lowest levels.

D. Initiatives Affecting RC Equipment

The Army fully supports transparency initiatives on equipping and modernizing the ARNG and USAR. Resource limitations require the Army to prioritize equipping and modernizing the Total Force based on priorities established by the Army Senior Leadership as guided by the NDS. Priorities that effect equipping and modernization levels inside the RC are fielding to deploying units and the establishment of new, or high priority units in the force. The Army's effort to ensure RC equipment is auditable and traceable, from the resourcing phase until delivery to particular units, is known as transparency. The current format for this tracking effort, called the Equipment Transparency Report (ETR), was standardized for all of the Military Services. The ETR is provided semiannually to the Office of the Assistant Secretary of Defense for Readiness.

The ETR provides visibility over the procurement and delivery of equipment, specified in procurement budget exhibits, to the ARNG and USAR. Collecting the data remains a manual effort of cross-walking disparate information from the Programming, Budgeting and Execution phases of the Department of Defense (DoD) financial management information systems. While the DoD systems work to achieve financial auditability, the Army has worked to overcome this ETR challenge by better implementing the DoD requirement for "Item Unique Identification (IUID)." The applied Unique Item Identifier on each procured item under the IUID process will provide the Army an automated means to cross-walk data from the specific appropriation through the delivery of procured equipment to the ARNG and USAR. The Transparency General Officer Steering Committee has recognized the significance of IUID implementation as a key tool to help automate the ETR.

The Army is exploiting the use of universal data transactions to provide discrete traceability to track delivered equipment to the Fiscal Appropriation. These improvements, in conjunction with the implementation of IUID, will provide the Chief, National Guard Bureau, the capability to "certify" in accordance with Title 10, Section 10541, receipt and non-receipt of expected items.

E. Army Plan to Achieve Compatibility between Regular Army (RA) and RC

The Army reviews compatibility between the RA and the RC based on mission alignment. The Army leverages the unique capabilities of ARNG and USAR forces to support early and mid-deploying forces as identified in Army War Plans by appropriately improving RC readiness as a key element of the Army's operational depth.

F. Army Component Equipment Modernization.

The United States' competitive advantage is eroding. It is being challenged in every domain of warfare (land, maritime, air, cyber, and space) and those challenges are growing in scale and complexity. Since 2001, the Army's focus on Counter-Insurgency and Counterterrorism allowed near-peer adversaries to improve their modernization efforts. The Army must regain its overmatch and competitive advantage against emerging threats, competitors, and adversaries. It must transition from readiness to modernization to increase lethality against emerging regional and global near-peer adversaries. This modernization strategy has one simple focus: make Soldiers and units more lethal.

The Army's equipping approach categorizes equipment to help establish a "modernization path." Over time, systems transition from developmental to legacy to obsolete. The Army's approach to meet mission requirements, with a mix of new procurement and legacy items, allows for good stewardship of taxpayer dollars. This strategy provides for more modern equipment, to maintain unit readiness and technological overmatch, over extended procurement periods.

II. Army National Guard Overview

"When I look at the National Guard equipment, I want to make sure that at every opportunity, our equipment is not only deployable and sustainable, but it is actually interoperable with the active components and in many cases our allies as well."

General Daniel R. Hokanson, Chief, National Guard Bureau, 2020 Senate Hearing

A. Current Status of the Army National Guard

1. General Overview

Top ARNG Focus Areas

- Ensuring that ARNG equipment is interoperable, deployable, and sustainable
- Completing Blackhawk helicopter modernization
- Ensuring mission command system interoperability with the Regular Army and the Joint Force
- Reinvesting in Engineer and Mobility equipment
- Modernizing Critical Dual Use equipment to support domestic operations and contingency missions
- Maintaining modernization in soldier systems with Regular Army across ARNG

The Army National Guard (ARNG), authorized 336,000 Soldiers (FY 2020), is a combat-tested and experienced operational force, as well as the nation's most capable disaster and crisis response force. The ARNG increases the capabilities and capacity of the Total Force, providing the Army with 39 percent of its Operating Forces and 22 percent of its Generating Forces and managing nearly 42 percent of its manned and unmanned aircraft. Federal missions require the ARNG to build readiness for the war-fight, while the nation's governors call on the ARNG year round to support domestic operations and emergencies within the 54 states and territories and the District of Columbia. The ARNG resides in almost 2,500 communities across the nation, in 2,278 readiness centers, 110 training centers, 54 regional training institutes, and 824 maintenance facilities. The ARNG's Citizen Soldiers embody both civilian and military skill sets well-suited to understanding and operating in an increasingly complex global and domestic environment.

a. ARNG Modernization Overview

As the Army prioritizes modernization and new equipment fielding for the Total Force based on operational requirements, the ARNG fully partners and collaborates with the Regular Army (RA) to maintain readiness while developing capabilities and ensuring interoperability for future Multi-Domain Operations (MDO).

ARNG Soldiers are embedded within Army Futures Command, its eight Cross-Functional Teams, and its Program Executive Office, to ensure ARNG perspectives and mission requirements are incorporated into the Army's six top modernization priorities. Additionally, to account for the rapid pace of technological advances and the escalating speed of the Army Modernization Enterprise, the ARNG is posturing itself to ensure there is a well-balanced and synchronized modernization and organizational design approach to achieve the highest level of mission ready formations.

As the Army transitions to Multi-Domain, Large-Scale Combat Operations (LSCO) against near-peer adversaries while fiscally assessing modernization priorities, the ARNG will continue to advocate for modernizing ARNG formations, safeguarding its ability to remain interoperable, deployable, and sustainable with the RA.

a. Status of the ARNG as an Operational Force

> *"And when we look at the current global situation, of course, we want to ensure that those in first contact have the absolute best equipment that our country can provide. We cannot always know who that first unit is going to be. And so, I will advocate at every opportunity to ensure the National Guard is modernized alongside its active components."*
>
> ***General Daniel R. Hokanson, Chief, National Guard Bureau, 2020 Senate Hearing***

The ARNG today comprises 13 Command and Control Headquarters, two Special Forces Groups, one Security Force Assistance Brigade, 27 Brigade Combat Teams (BCTs), 42 Multi-Functional Brigades, and 54 Functional Brigades and Groups across the 54 states and territories and the District of Columbia. As of 4 August 2020, 25,700 ARNG Soldiers were mobilized in a Title 10 status to support Global Force Management Allocation Plan requirements. In addition, 20,538 Citizen Soldiers were deployed for overseas trainings or supporting Domestic Operations (DOMOPS) related to the following events: COVID-19 (20,188), Civil Disturbance Operations (241), and Hurricane Isaias (109). The current size of the Total Force and the multiple threats the nation faces from potential adversaries require the ARNG to remain tactically and technically proficient. Thus, a multiyear training cycle is required to build on collective unit training tasks to maintain required levels of readiness and prepare units to deploy rapidly in response to contingency operations. Brigade rotations to either the National Training Center at Fort Irwin, CA, or the Joint Readiness Training Center at Fort Polk, LA, validate the ARNG as a ready and relevant operational force. These large-scale training rotations provide the opportunity to hone warfighting skills and reduce post-mobilization timelines, ensuring units across the Total Force remain **interoperable, deployable, and sustainable**.

b. Domestic Operations and State Missions

ARNG support to civil authorities encompasses mission sets ranging from Weapons of Mass Destruction–Civil Support Team (WMD-CST) employments, support to local law enforcement, and natural disaster relief to border protection and counterdrug missions, as shown in Table 2-1.

Table 2-1. FY 2019 Domestic Operations and State Missions

Event Type	Event Amount	Event Type	Event Amount
Key asset protection	2	Water support	2
Law enforcement support	5	Severe weather	3
Winter storm response	3	Tornado Response	3
Flood response	11	Joint Operations Center support	1
Special event	9	Southwest border support	4
Wild Fire	19	Counterdrug support	54
Hurricane response	12	WMD-CST Employments (Response and Standby)	1,119
Civil Disturbance	37	Earthquake Response	1
Search and rescue	93	Cyber Support	14
Transportation Response	1	Explosive Ordnance Disposal	44
COVID-19	54		

In FY 2020, the ARNG contributed over 1.5 million man-days to the 54 states and territories and the District of Columbia for various missions. The ARNG provides civil authorities 10 critical core capabilities that save lives, protect property and help communities recover from catastrophic events. These "Essential-10" capabilities include Aviation/Airlift; Command and Control; Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE); Engineering; Medical; Communications; Transportation; Security; Logistics; and Maintenance. The National Guard Chemical, Biological, Radiological, Nuclear Response Enterprise elements consist of the WMD-CSTs, Homeland Response Forces, and CBRNE Enhanced Response Force Packages. To be ready and available to respond to these missions, it is crucial the ARNG's Essential-10 capabilities receive the most modern and capable equipment.

2. Status of Equipment

b. Equipment On-Hand

The ARNG, in coordination with Headquarters, Department of the Army (HQDA), produces the biannual ARNG Equipment On-hand (EOH) Dashboard (referenced in Appendix B), which provides an overall percentage of EOH against requirements in the Modified Tables of Equipment (MTOE) for each of the 54 states and territories and the District of Columbia. This year the EOH percentages are calculated without substitutions. The ARNG Dashboard also depicts equipment available for domestic operations, anticipated equipment deliveries, the percentage of modernized equipment, and Critical Dual Use (CDU) equipment divided into ARNG Essential-10 requirements. The CDU list comprises equipment critical to both domestic and warfighting missions, and is updated periodically by the RA in coordination with ARNG to reflect changes to current requirements and force structure. Each year, the Director, Army National Guard submits CDU list recommendations to HQDA for vetting and approval.

As of July 2020, without counting authorized substitutions, ARNG MTOE units have 87 percent of all required equipment on hand and 92 percent of CDU equipment on hand. Accounting for operational readiness status, 80 percent of all MTOE unit equipment and 85 percent of CDU

equipment is available to governors for domestic operations. Table 2-2 provides an overview of the most significant ARNG CDU shortages in accordance with Essential-10 requirements to equip domestic missions. As CDU equipment is modernized, the Army's strategy is to pure-fleet ARNG shortfalls by fielding the most modern equipment or cascading more modern equipment.

Table 2-2. Army National Guard Top CDU Shortages

Capability	Nomenclature	Procurement Unit Cost (PUC)	Shortage	Shortage Value
Logistics	Load Handling System (LHS) 2,000 Gal Tank (HIPPO)[a]	$131K	835	$109.4M
Transportation	Semitrailer Flatbed: Container Transporter 34T[b]	$106K	1,188	$126M
Engineering	Tractor Full Tracked High Speed (DEUCE)[b]	$398K	27	$10.75M
Transportation	Semitrailer Low Bed 25T 4 Wheel	$180K	384	$69.1M

[a] Capability will be further addressed in Parity Assessment.

[b] ARNG Pacing Item (Mission Critical equipment impacting readiness reporting).

Note: The quantity shortages depict the equipment shortfalls and total funding cost projected in FY 2023 as reported against the 2006 Structure and Composition System (SACS) File.

c. Average Age of Major Items of Equipment

The average age of selected major equipment items at the beginning of FY 2021 is provided in *ARNG Table 2 Average Age of Equipment.* The Army continues to invest in manufacturing and recapitalization programs through FY 2021 to support strategic modernization. Changes to Army modernization priorities has required the Total Force to retain some legacy equipment past its Economic Useful Life (EUL) until funding is available to modernize or replace it. For example, the M872A4 Semitrailer flatbed, break-bulk container Commercial 34 ton transporter supports transportation capabilities within the ARNG Essential-10. Additionally, the ARNG continues to modernize its mixed fleet of bridging assets, Bridge Armored Vehicle Launched Scissor 60 ton and 85 ton, that support war-fight requirements.

Aging equipment degrades the quality of the Total Force as the Army competes globally across the engagement spectrum, but appropriated funding mitigates the effects of an aging ARNG fleet. For example, the Army's High-Mobility Multipurpose Wheeled Vehicle (HMMWV) Recapitalization Program has reduced the average fleet age from 28 years to less than 5 years for over 1,700 HMMWV ambulances and from 10 years to less than 5 years for over 2,000 Up-Armored HMMWVs. The recapitalized HMMWVs are now equipped with the Army's most technologically advanced operational capabilities and safety upgrade features.

The convergence of the Logistics Information Warehouse Data Base with Program Manager (PM) Army Enterprise System Integration Program in FY 2018 rendered FY 2021 average equipment age data irretrievable. The current system is unable to capture the age of equipment as items are divested or replaced by more modern equipment. This affects the validity of data in *ARNG Table 2 Average Age of Equipment.*

Table 2-3. Army National Guard Top Legacy Equipment

Nomenclature	Line Item Number	Average Age (years)	ARNG EOH	EUL (years)
Launch M60 Series Tank Chassis Trnsptg: 40 & 60 ft. Bridge[a]	L43664	35	91	17–25
Semitrailer Low-bed: 40-ton 6-Wheel	S70594	29	1244	20–25
Recovery Vehicle Full Tracked: Medium M88A1[a]	R50681	42	180	25–30

[a] ARNG Pacing Item (Mission Critical equipment impacting readiness reporting).
Note: The Average Age (years) is an estimate using FY 2019 date.

d. ARNG Modernization

The ARNG is modernized through procurement appropriations, redistribution (cascading), and statutory provisions, including the National Guard and Reserve Equipment Appropriation (NGREA) and directed appropriations. Programmed funding and cascading provided the ARNG more than $1.67 billion for equipment modernization efforts in FY 2019. New procurement was the primary source of modernization, providing $1.53 billion (92 percent), while NGREA funding provided $104.5 million (6 percent), and cascaded equipment from the RA amounted to $31 million (2 percent). All three ARNG modernization equipping methods are vital to ensuring ARNG is **interoperable, deployable, and sustainable**. The ARNG did not receive NGREA funding for FY 2020.

As of FY 2019, the ARNG equipment inventory is mixed with various levels of modernization: 58 percent of ARNG EOH is considered modern (combat-capable items that have completed their procurement phase), 26 percent is most modern (still in procurement), and less than 1 percent is developmental (low rate initial production). In keeping with the Army's modernization priorities, nearly 80 percent of ARNG Aviation and Fires portfolio requirements are filled with the most modern equipment. However, more than 50 percent of ARNG Enabler portfolios (Transportation, Mobility, Maneuver, and Intelligence, Electronic Warfare) are filled with the least modern equipment. The ARNG strives to provide its Citizen Soldiers with the most modern equipment to properly support the war-fight and their communities.

The Army's new Substitution Rule (equipment can be counted as a substitute if it is at or above the modernization level of the authorized piece of equipment) is a clearer method for tracking modernization levels (variants of equipment) within the Total Force. The ARNG currently reports, in the aggregate, 85 percent EOH without authorized substitutions of current requirements and 93 percent EOH using authorized substitutions (more modern systems). Within the 20 Major Capability Portfolios FY 2021–FY 2023, the ARNG primary EOH shortfalls are in General Engineering, Soldier Weapons, and Support Systems. Although increased modernization to major combat platforms supports Army modernization priorities for lethality, equipment shortages in enabling units hinder ARNG ability to fully support Large Scale Combat and DOMOPS. Additionally, concurrent modernization of ARNG Mission Command systems is vital to ensuring interoperability across the Total Force. To mitigate equipment shortfalls required for assigned missions or operations and safeguard mission success, the ARNG continues to cross-level the most modern equipment within and between the 54 states and territories and the District

of Columbia. This strategy is not ideal because it impacts ARNG units' operational readiness, but maximizes organizational effectiveness in a resource-constrained environment.

Table 2-4. Army National Guard FY 2020 MTOE Modernization Shortages

ARNG FY 2021 MTOE/AUG-TDA	Requirement ($B)	EOH ($B)	Shortage ($B)	Shortage (% of Reqd)
Pure Fleet "Modern" Equipment	$98.04	$90.67	$7.36	7.52%
ARNG FY 2020 MTOE/AUG-TDA	**Equipment Requirement**	**EOH (items of equipment)**	**Equipment Shortage**	**EOH Shortage (% of Reqd)**
Pure Fleet "Modern" Equipment	2,577,753	2,252,782	324,971	12.62%

Note: Modernization shortfalls are measured against documented equipment requirements, not most modern capabilities.

e. Maintenance

The age and condition of ARNG maintenance facilities is a concern. Forty-two percent of the 824 ARNG maintenance facilities are over 40 years old and do not effectively facilitate modern maintenance mission requirements. The significant increases to requirements for EOH within ARNG Armored Brigade Combat Teams (ABCTs), as well as technological advances and fleet modernization in some of their major combat systems, have increased requirements for overhead lift, electrical power, and specialized diagnostics, necessitating additional facility floor space. Military construction funding for the ARNG's long-range construction planning for surface equipment maintenance facilities remains at $2.8 billion, based on input from the Planning Resource for Infrastructure Development and Evaluation database. The level of maintenance performed at these facilities directly impacts maintenance readiness and units' ability to sustain operational readiness. ARNG maintenance facilities must keep pace with the increasing requirements of a technologically advanced fleet of combat and support equipment to perform assigned military missions and provide support during natural and manmade disasters.

The ARNG Surface Depot Maintenance Program (SDMP) executed by Army Materiel Command strategically supports ARNG fleet readiness. The ARNG SDMP provides reliable and sustainable readiness throughout the lifecycle overhaul of critical combat and support equipment. ARNG depot sustainment activities enable commanders to maximize fleet readiness and apply critical Operating Tempo (OPTEMPO) funding to sustain readiness at the unit level. The ARNG SDMP funding for FY 2020 was $162 million, 77 percent of the ARNG's critical requirement of $213.1 million for FY 2020. Resourcing levels that fully fund ARNG critical requirements for FY 2021–FY 2025 are essential to sustaining the ARNG fleet as increased OPTEMPO places greater demand on ARNG capabilities. Continued under-resourcing of ARNG SDMP would degrade overall ARNG combat fleet readiness and reduce efforts to sustain critical communications, control, computers, cyber, intelligence, and reconnaissance equipment.

In FY 2020, the ARNG Field-Level Home Station Reset Program received approximately 80 percent of requested funding and restored 90,000 pieces of unit equipment returning from overseas deployments and contingency operations. The program returned this equipment to

Technical Manual 10/20 (TM10/20) standards within 365 days of returning to home station. This program is vital for restoring necessary operational readiness to support Sustainable Readiness Model timelines. Full or partial unit equipment deployments place increased importance on the Field Level Home Station Reset to return equipment back to TM 10/20 standards so it can be available for the next federal or state mission. Beginning in FY 2021, the ARNG Field Level Home Station Reset Program will include an ABCT equipment set along with other company and battalion sets of re-deployed equipment. This requirement of a full BCT or BCT-minus set of equipment will continue each year for the foreseeable future.

f. Other Equipment Specific Concerns

Recent reprioritization of funds from systems in procurement to more modern and LSCO-related initiatives has diminished the Army's ability to fully fund previously programmed Army Acquisition Objectives (AAO) or Army Procurement Objectives for many systems. As a result, ARNG units not tied to "first to fight" or forward forces may not be authorized the most modern equipment. For example, the Army operates three Abrams Tank variants (M1A2 SEPv3, M1A2 SEPv2, and the M1A1 AIM-SA). By FY 2025, the RA will be pure-fleeted with the most modern M1A2 SEPv3 variant. However, the ARNG will have a mixed fleet, and will maintain a two variant fleet into the foreseeable future. This modernization strategy reflects the reality of resource limitations, but also means that the ARNG must sustain less modern equipment at a potentially higher cost.

The objective of preserving Reserve Component equipment was launched when Department of Defense Directive 1225.6 was first published in 1970. The current Department of Defense Instruction (DoDI) 1225.06 *Equipping the Reserve Forces* continues to ensure and preserve property accountability and transparency for withdrawals, reductions, or loans of any equipment from the Reserve Component (RC). The ARNG, in conjunction with the Army Sustainment Command (ASC) and HQDA G-8, continues to monitor replacement pay back requirements established since 2003 and approved by the Secretary of Defense. Vigilance and coordination between all stakeholders preserves ARNG unit readiness.

The current DoDI 1225.06 ARNG register contains ten types of equipment, totaling 268 pieces that require reconciliation. In FY 2020, the Army returned two Mine Clearing Line Charge items to ARNG. The ARNG continues to work closely with the ASC and HQDA to ensure equipment is returned and future transfers are properly coordinated and approved in accordance with DoD policy.

B. Changes from FY 2020 NGRER

ARNG Table 1 Consolidated Major Item Inventory and Requirements and *ARNG Table 7 Major Item of Equipment Substitution List* provide projected equipment inventories, shortfalls, and modernization requirements for the ARNG (from FY 2020 through FY 2024). The projected requirements for the FY 2024 Total Army Equipment Distribution Plan (TAEDP) uses the June 2020 (2006) SACS File.

The most notable change between past and current reports is the decreased ARNG EOH percentage with authorized substitutions. In the current NGRER, the Army calculated ARNG

EOH without authorized substitutions as a 6.71 percent shortage, as compared to a 3.64 percent shortage reported previously, which included authorized substitutions. The increase in EOH shortages is due to the Army's new authorized substitution requirement. Although the Army mandates the use of on-hand authorized substitute equipment to fill capability gaps when there are delays in modernization, an authorized substitution is only valid for equipment at the same modernization level or higher. For example, if the ARNG is authorized the M1A2 SEPv2 Abrams Tank, only the M1A2 SEPv3 (more modern variant) may be used as an authorized substitution. Last year, the Army allowed the M1A1 AIM-SA (less modern variant) as an authorized substitution for the M1A2 SEPv2 Abrams Tank. This change in methodology helps the ARNG more accurately track the modernization levels of formations.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2024 Equipment Requirements

ARNG Table 1 Consolidated Major Item Inventory and Requirements[2] provides the projected FY 2022–FY 2024 major equipment inventories and requirements. ARNG identified equipment items that are CDU and Pacing Items (mission critical equipment impacting readiness reporting).

2. Anticipated New Equipment Procurements:

The new Cold Weather All-Terrain Vehicle (CATV) replaces the aging Small Unit Support Vehicle (SUSV) as a light-weight, tracked vehicle with exceptional cross-country mobility, capable of operating in extreme environmental conditions and in terrain that is impassable to most other forms of vehicular transportation, such as snowy, marshy, amphibious, and mountainous terrain. ARNG units in Alaska, Vermont, Colorado, and Minnesota utilize the SUSV to perform disaster response and training support, including training at the Army Mountain Warfare School at Camp Ethan Allen in Jericho, VT. The SUSV is not a Program of Record (POR) with all sustainment maintenance and reset funding provided. However, in May 2019, the Army Requirements Oversight Committee approved the new CATV as a POR with a quantity requirement of 92 vehicles for the ARNG.

3. Anticipated Transfers/Withdrawals from ARNG Inventory

ARNG Table 5 Projected Equipment Transfer/Withdrawal Quantities shows inventory excess to the RA that has the potential to fill shortages in the ARNG each year from FY 2021 to FY 2023. Transferred equipment that is provided to the RC once the RA receives more modern equipment is commonly called "cascaded equipment."

In FY 2021, the RA will continue to cascade modernized equipment across the Major Capability Portfolios to fill readiness shortfalls. Although the equipment generally received is not the most modern, the items received fill capability gaps to promote readiness with combat capable equipment. Of note, the ARNG anticipates a large number of M1097 HMMWV to be cascaded from the RA as they field the Joint Light Tactical Vehicle (JLTV) to their formations. The Army also identified additional potential cascades to increase EOH in Soldier Systems (M4A1 Rifles

[2] Referenced data tables can be found at the end of each component narrative.

and PVS-14 Monocular Night Vision Device), as well as 1,485 Combat Support Systems (Mine Resistant Ambush Protected All-Terrain Vehicle).

4. Equipment Shortages and Modernization Shortfalls at the End of FY 2023

Table 8 Significant Major Items Shortages provides equipment inventories, shortfalls, and modernization requirements for the ARNG at the end of FY 2023. The primary equipment items of concern are Mission Command systems that ensure ARNG interoperability with the RA and the Joint Force. In addition, ARNG continues to seek modernization solutions in the Intelligence and Electronic Warfare, Engineering, and Mobility portfolios. *ARNG Table 8 Significant Major Items Shortages* excludes the five required systems discussed in the 2019 National Defense Authorization Act Parity Assessment (addressed in Appendix D) and other ARNG equipping shortfalls where sourcing solutions were identified.

The quantity and funding shortages in the following major capability portfolios depict the equipment shortfalls and total funding cost from the ARNG MTOE and Augmentation Table of Distribution & Allowance (Aug–TDA) equipment requirements projected in FY 2023 as reported against the TAEDP using the 2006 SACS File.

a. Aviation Portfolio

The ARNG has 42 percent of the total Army's Aviation force structure consisting of rotary-wing, fixed-wing, and unmanned aircraft systems (UAS) platforms; enablers for Aviation Ground Support Equipment; and Air Traffic Control Systems.

Investment in New Procurement and Modernization: The ARNG has 360 of the most modern H-60M aircraft on-hand, and is on track to reach the modernization requirement and acquisition objective of 511 of the H-60M by FY 2026. In FY 2022, the ARNG will begin fielding 187 H-60V model helicopters. By FY 2029, the ARNG H-60 Utility Helicopter fleet is projected to achieve complete digital capability with a mix of H-60M and H-60V aircraft.

The ARNG Cargo Helicopter fleet is completely modernized with 165 of the Multiyear l CH-47F aircraft. The ARNG's 212 Light Utility Helicopter UH-72A Lakota will require lifecycle modifications to sustain the fleet through the next decade. The Army's plan to modernize the four ARNG Attack Reconnaissance Battalions (ARBs) with 24 AH-64E Apache aircraft in each ARB from FY 2022 through FY 2026 remains unchanged. ARNG ARBs are currently fielded with 18 AH-64D Apaches. The ARNG fixed-wing fleet is comprised of 57 aircraft (46 C-12 and 11 C-26) stationed in 52 locations.

The ARNG completed 100 percent of the version 2 fielding for the RQ-7B Shadow (Most Modern) UAS. The Small UAS (SUAS) Raven is currently equipped at 77 percent across ARNG formations. The Raven program for Compos 1, 2, and 3 was fielded at 85 percent. The high attrition rate of operators, currency requirments, and system shortages has left multiple units unable to adequately train and maintain SUAS proficiency in pre-mobilization status. The Medium Range Recon UAS will replace the Raven beginning in FY 2021/2022 and PM UAS will field ARNG units to full authorizations. See Table 2-5 for current ARNG modernization shortfalls.

Table 2-5. Army National Guard Top Aviation Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total Cost
Small Unmanned Aircraft System, Raven B	S83835	$22K	185	$4.01M

b. Maneuver Portfolio

Maneuver Portfolio encompasses families of combat systems including Abrams tanks, Bradley and Stryker Fighting Vehicles, and HERCULES Recovery Vehicles for ARNG ABCTs and Stryker Brigade Combat Teams.

Investment in New Procurement and Modernization: The ARNG projects three ABCTs will be modernized through new procurement of Abrams (M1A2 SEPv3) and by cascading Bradleys (M2A3) from the RA. Cascades are expected to begin in FY 2023. ARNG maintains the only mixed fleet ABCT of both modernized M1A2 SEPv2 and less-modern M1A1 AIM-SA Abrams tanks in the Army Enterprise. A mixed fleet poses additional parts, logistics, and supply chain challenges that hamper an ABCT's ability to maintain and deploy. The shortfall of 14 of the most modern Abrams tanks listed in Table 2-6 reflects one cavalry troop in the 116th ABCT in Nevada.

Army increased funding to pure-fleet both RA and ARNG ABCTs with modernized M88A2 HERCULES recovery vehicles. The HERCULES allows single vehicle recovery of the 70 Ton SEPv2 Abrams tank. However, funding is unavailable to fill the remaining ARNG ABCT modernization requirement as reflected in Table 2-6. Lastly, the Army has invested in four variants of Armored Multi-Purpose Vehicles (AMPVs) to modernize the M113s (Armored Personnel Carrier) within the ABCTs. The ARNG will begin fielding the AMPV in FY 2026 to prioritized units.

Table 2-6. Army National Guard Top Maneuver Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total Cost
Tank Combat Full Tracked 120MM M1A2[a]	T13305	$7.6M	14	$106.4M
Recovery Vehicle Full Tracked: Heavy M88A2[a]	R50885	$4.03M	5	$20.2M

[a] ARNG Pacing Item (Mission Critical equipment impacting readiness reporting).

c. Soldier Portfolio

The Soldier Portfolio administers oversight of individual/crew-served weapons, thermal weapons sights, night vision, Improved Target Acquisition Systems (ITAS), mortars, and other weapon support items. The portfolio is fundamental to maintaining the ARNG as an operational force.

Investment in New Procurement and Modernization: The M3E1 Multi-role Anti-armor Anti-personnel Weapon System (MAAWS) is 28 percent lighter than the M3 and contains corrected ballistic solutions for engaging moving targets. The Army is projected to modernize the Close Combat Force (CCF) (~104K Soldiers, of which are ~48K Guardsmen) with the first new rifle since Vietnam, the Next Generation Squad Weapon and the Next Generation Soldier Rifle

starting in FY 2023. Additionally starting in FY 2021, the CCF will modernize night vision capabilities with a leap forward, the Integrated Visual Augmentation System which will combine night vision, communications, navigation, and much more, enabling the Soldier to have full situational information on his surrounding, team, platoon, and company.

The ARNG will complete fielding of M4A1 rifles and M-17 handguns by FY 2023. As of FY 2020, the following Soldier systems are at or near 100 percent filled: crew-served weapons, thermal weapons sights, ITAS, mortars, and other weapon support items.

Table 2-7. Army National Guard Top Soldier Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Short (FY 2020)	Total Cost
84mm Recoilless Rifle M3E1, MAAWS	Z05704	$35K	734	$25.7M

d. Air and Missile Defense Portfolio

The Air and Missile Defense (AMD) portfolio consists of seven Avenger Battalions, three Air Defense Brigades, one Army Air and Missile Command, one Air Defense Regional Training Institute, and 72 Air and Missile Airspace Management Operation Centers. ARNG Army Air and Missile Defense Command has oversight of the ARNG units currently rotating into the National Capital Region Integrated Air Defense System and the European Defense Initiative exercises and has discontinued the Counter Rocket Artillery Mortar missions in the Middle East. ARNG Air Defense Units continue to support training at the National Training Center and Joint Readiness Training Center and multiple test exercises.

Investment in New Procurement and Modernization: Beginning in FY 2020, the Army plans to activate additional Maneuver Short Range Air Defense (M-SHORAD) Battalions with modernized AMD Planning and Control Systems (AMDPCS). The activations will delay the modernization of seven ARNG Avenger Battalions (originally planned to begin in FY 2018) and extend the sustainment of the Avenger/AMDPCS to FY 2036. The Army plans to modernize the ARNG Avenger systems with a mixed fleet of the M-SHORAD and Indirect Fire Protections Capability (IFPC) or pure fleet one of the systems. However, accelerating this modernization is dependent upon the number of new builds of M-SHORAD/IFPC Battalions in the RA. Modernization delays limit combatant commanders' available resources for the war-fight.

e. Indirect Fires Portfolio

The Indirect Fires portfolio in the ARNG supports all BCTs and accounts for 70 percent of the Army's Field Artillery Echelon above Brigade force structure. The Indirect Fires portfolio consists of Field Artillery platforms, munitions, sensors, and Command and Control systems. Major items include: M119A3 and M777A2 Howitzers, Paladins, the Multiple Launch Rocket System (MLRS), the High Mobility Artillery Rocket System (HIMARS), Q-50 Lightweight Counter Mortar Radar, and Q-53 Counter Fire Target Acquisition Radar.

Investment in New Procurement and Modernization: In FY 2024–FY 2025, the ARNG is projected to modernize two MLRS Battalions with the MLRS Launcher (M270A2), providing soldiers with a higher survivability capability (see Table 2-8). In conjunction with this

modernization, these two MLRS Battalions will increase in size from two Batteries, each with 8 launchers, to three Batteries, each with 9 launchers. Beginning in FY 2021, the Army will also field the M109A7 Self-Propelled Howitzer under the Paladin Integrated Management program to one ARNG ABCT per year. Lastly, the ARNG has received 42 percent of the Q-53 requirement and projects it will complete fielding in FY 2023 (see Table 2-8).

Table 2-8. Army National Guard Top Indirect Fires Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Projected Total Shortage Cost
MLRS: M270A2	Z05503	$5,353,000	32	$172M
Counter Fire Target Acquisition Radar – Q53	R05016	$8,500,000	40	$340M

Note: The quantity shortages depict the equipment shortfalls and total funding cost projected against the Army Modernization Strategy.

f. Mission Command Portfolio

The Mission Command Portfolio encompasses battle command information systems, Mission Command Applications, and Mission Command Transport & Enablers. Concurrent and balanced modernization with the RA is vital to ensure interoperability.

Investment in New Procurement and Modernization: By FY 2025, the ARNG projects it will pure fleet the Joint Battle Command–Platform (JBC-P) (software) and Mounted Family of Computer System (hardware) to modernize the Blue Force Tracker (BFT). The JBC-P program procures and fields hardware (vehicle platform computer systems, satellite transceivers, encryption devices, and ancillary equipment) and software capabilities for the full spectrum of military operations. The Army force structure growth (approved in the Army Structure Message FY 2020–FY 2024) and the Army Preposition Stock Configure for Combat decision created a ten percent increase in the total Army requirement, delaying ARNG full modernization until FY 2025. ARNG JBC-P modernization efforts are also addressed in Appendix D.

Table 2-9. Army National Guard Top Mission Command Modernization Shortages

Nomenclature	Line Item Number	PUC	Current Total AAO
JBC-P (BFT Vehicle Kit)	C05036	$21,706K	32,024[a]
JBC-P Command Post (TOC Kit)	C05037	$28,347K	2,208[a]
JBC-P LOG Control Station (LOG TOC Kit)	C05054	$26,059K	1,563[a]
JBC-P LOG Mobile Unit (LOG Vehicle Kit)	C05055	$8,342K	10,356[a]

[a] Current AAO to be procured by FY 2025.

* Average Procurement Unit Cost $24,796K for JBC-P (family of system and components).

g. Force Protection Portfolio

The Force Protection Portfolio consists of warfighter protection systems including Nuclear, Biological, and Chemical Reconnaissance Vehicles (NBCRVs). The ARNG ABCTs and IBCTs

have 85 percent of the portfolio's authorized NBCRVs. The Force Protection portfolio has previously relied on overseas contingency operations funding to procure equipment.

Investment in New Procurement and Modernization: COVID-19 led to delays in many new-start programs, such as the NBCRV Sensor Suite Upgrade. Starting in FY 2023, the ARNG will modernize the NBCRV fleet with a sensor suite upgrade. However, the ARNG has a shortfall of 12 NBCRV systems with no sourcing solution. This system is in sustainment and no longer procurable. The NBCRV is both a Pacing Item (reports against readiness) and a CDU requirement. The lethality in the maneuver formation is degraded without the required reconnaissance assets. The ARNG will cross-level the NBCRVs as needed to fulfill mission requirements.

Table 2-10. Army National Guard Top NBC Force Protection Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total Cost
Nuclear, Biological, and Chemical Reconnaissance Vehicle[a]	N96543	$4.5M	12	$54M

[a] Current AAO to be procured by FY 2024. ARNG Pacing Item (Mission Critical equipment impacting readiness reporting).

h. Intelligence and Electronic Warfare Portfolio

The IEW Portfolio consists of a mix of mission-critical systems in support of explicit military intelligence and electronic warfare activities. Due to investment in new procurement and modernization, 43 percent of ARNG units are operating on non-authority to operate (ATO) compliant hardware and software and 11 percent of ARNG units are operating on non-ATO compliant hardware. ARNG is projected to have 46 percent of its units on non-ATO compliant hardware and software until Army modernization efforts begin fielding to the ARNG in FY 2025. These hardware and software deficiencies degrade or eliminate the ARNG Military Intelligence Warfighting Function ability to operate digitally, collect and disseminate intelligence, and create interoperability challenges with modernized formations.

1. Distributed Common Ground System–Army (DCGS-A) Family of Systems: The DCGS-A is a Family of Systems (multiple LINs) consisting of both software and hardware. DCGS-A supports the intelligence warfighting function and helps apply intelligence core competencies (intelligence synchronization, intelligence operations, and intelligence analysis). DCGS-A is the Army's cornerstone intelligence system for sensor tasking, Processing, Exploitation, and Dissemination at all echelons, and provides unprecedented, timely, relevant, and accurate data to Soldiers from the Non-Secure Internet Protocol Router level up to the Top Secret/Sensitive Compartmentalized Information level.

a. Multifunction Workstation (MFWS): Thirty-eight percent of the ARNG MFWS fleet requires replacement because of age or cyber vulnerabilities. ARNG is working to include lifecycle replacement future funding, but funds are not yet programmed for near-term replacement.

b. Intelligence Fusion Server (IFS): Fifty-seven percent of the ARNG's IFS fleet is obsolete, and 46 percent of ARNG units will lose this capability with the projected fielding cuts.

c. Intelligence Processing Center (IPC): Sixty-three percent of the ARNG IPC-2 fleet must be updated to version D(V)2 to maintain compatibility with modernized formations and reduce cybersecurity vulnerabilities.

d. Geospatial Intelligence Workstation (GWS): Proposed fielding reductions will meet only 7 percent of ARNG's GWS needs. Forty-four percent of the ARNG GWS fleet requires replacement and 56 percent requires security modules because of age or cyber vulnerabilities.

e. Tactical Intelligence Ground Station (TGS): Every TGS in the ARNG's fleet requires a technological refresh because multiple sub-components will reach end of life/support in FY 2022.

f. Cross Domain Solution Set (CDSS): Seventy-four percent of ARNG's CDSS fleet requires hardware replacement to maintain compliance with policy and standards and reduce cyber vulnerabilities.

Table 2-11. Army National Guard Top IEW Modernization Shortfalls

Nomenclature	Line Item Number	PUC	Procurement Amount	Total Cost
MFWS	A35329	$5,300K	1,037	$5.496M
IFS	A35397	$309.3K	150	$46.4M
IPC-2	C18176	$1.8M	22	$39.6M
GWS	D11498	$63.9K	70	$4.476M
GWS–Security Module only	D11498	$68.8K	102	$7M
TGS–TECH refresh	T37036	$500K	35	$17.5M
CDSS	C60625	$182.1K	40	$7.286M

i. Engineering and Mobility Portfolio

This portfolio affords ARNG critical mobility, counter-mobility, and a versatile mix of capabilities facilitating freedom of maneuver in support of the National Defense Strategy, the AimPoint Force, and Army Modernizations priorities. It enables Engineer formations to provide support throughout the range of military operations, including Homeland Response and Domestic Support to Civil Authorities. The portfolio includes Armored Engineer Vehicles, Bridging, Counter Explosive Hazards, Engineer Command and Control, Engineer & Special Unit Support, and Mines and Munitions systems.

Investment in New Procurement and Modernization: For FY 2022, the Army's base budget anticipates that procurement funding for the ARNG accounts for 40 percent ($227 million) of the total Army Mobility portfolio ($564 million), while RA procurement funding accounts for 35 percent ($196 million). Modernization funding primarily reflects investments in improving armored engineer vehicles, bridging support systems, counter explosive hazard vehicles, and enabler capabilities. Nonetheless, the failure to fund the Army's modernization priorities in

previous years gravely impacted the ARNG Engineering and Mobility portfolio. Specifically, 4 of the 11 ARNG Multi-Role Bridge Companies will not go through the recapitalization program upgrades from M1977A0/A2 Common Bridge Transport (CBT) to the M1977A4 CBT. Therefore, ARNG Multi-Role Bridge Companies will lack the same level of survivability and modernization as the RA.

The All-Terrain Heavy Crane will not fully modernize from the 25 ton crane because of lack of funding. The ARNG is planning to field 20 All-Terrain Cranes in FY 2021 utilizing FY 2019 approved NGREA dollars. However, 43 ARNG Engineer Companies (*Engineer Construction, Engineer Vertical Construction, Engineer Support Company, and Combat Engineer Company-Infantry (CEC-I)*) will remain un-modernized because of the absence of funding. The ARNG is projected to modernize 66 percent of the remaining requirement and the Army continues to explore mitigation strategies to fill this modernization shortfall.

ARNG will not be fully modernized with the Hydraulic Excavator Type I (HYEX). Due to decrements in funding and reprioritization of FY 2020 NGREA, the ARNG wasn't able to address this modernization shortfall. This system provides enhanced ability to repair, maintain, and construct main supply routes, combat roads, trails, and airfields throughout the theater of operations. The ARNG only expects to reach 77 percent of its requirement.

The Detecting Set: Mine AN/PSS-14 program is substantially underfunded. In the Future Year Program Defense budget ARNG is funded at 56 percent. Without this capability, ARNG Units—Engineer, Ordnance, Field Artillery, Infantry, Armor, and Special Forces—will not have the ability to clear a path, trail, or road of mines, explosive hazards, and triggering mechanisms. The AN/PSS-14 is an enabler for Soldier Lethality as it allows for soldier maneuver by enhancing the probability and speed of detection of buried landmines and IEDs, thereby increasing the speed of dismounted operations and making the unit more efficient and lethal.

Table 2-12. Army National Guard Top Engineering and Mobility Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total Cost
Transporter Common Bridge M1977A4	T05067	$461K	196	$90.3M
HYEX[a]	E27792	$350K	52	$15.6M
Detecting Set: Mine AN/PSS-14	D03932	$27.5K	3638	$100.1M
All Terrain Crane [a]	Z05089	$1.1M	43	$47.3M

[a] CY 2020 CDU List.

j. Combat Service Support Sustainment Portfolio

The Combat Service Support Sustainment portfolio comprises maintenance, medical, quartermaster, and munitions capabilities that are essential to both the ARNG's war-time mission and DOMOPS. The Load Handling System Compatible Water Tank Rack (HIPPO) and Modular Fuel System Tank Rack Module (MFS-TRM) offer increased fuel and water capability and capacity, decreasing personnel requirements. The Maintenance Support Device is used for troubleshooting, diagnostic testing, and hosting Interactive Electronic Technical Manuals.

Investment in New Procurement and Modernization: The ARNG is projected to achieve only 64 percent of its HIPPO authorization, reducing Fires Brigade units' capability to support both wartime and domestic missions for potable water. Although modernization efforts are ongoing, ARNG will rely on cross-leveling efforts to support required missions. More information on this system is included in Appendix D.

The MFS-TRM provides a 2,500 gallon fuel storage and distribution capability. In FY 2022, the procurement for this system will end, at which time the ARNG will have met 88 percent of its requirement. The resulting shortfall limits the ability to efficiently transport and distribute fuel for assigned missions. Currently, ARNG has a shortage of 942 MFS-TRM systems. ARNG contracted the production of 512 MFS-TRM with FY 2019 NGREA funds to close the capability gap and augment procurement funding.

Table 2-13. Army National Guard Top Sustainment Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total PUC Cost
HIPPO[a]	T32629	$132K	371	$48.9M
MFS-TRM	T20131	$78.1K	942	$73.57M

[a] CY 2020 CDU List.

k. Combat Service Support Transportation Portfolio

The ARNG Tactical Wheel Vehicle (TWV) Family encompasses multiple vehicle types and variants to respond to myriad combat missions and support governors during DOMOPS. The TWV capabilities are essential to the Army's mission, residing in almost every formation within the ARNG. The TWV fleet includes Light, Medium, and Heavy Tactical Vehicles with associated trailers, as well as the JLTV Family of Vehicles.

Investment in New Procurement and Modernization: The Family of Medium Tactical Vehicles A2 variant will modernize the A0 (22 years old) and A1 (17 years old) versions. The divestiture of the aging vehicles reduces sustainment cost by approximately $1 million per year. ARNG is projecting an EOH of less than 50 percent by the end of FY 2025, impacting IBCT equipment readiness.

After FY 2020, Wrecker funding ends, severely hindering recovery capability of the Heavy Expanded Mobility Tactical Truck or light tactical wheeled vehicles across ARNG BCTs formations. Current procurement is not enough to mitigate the capabilities gap and readiness shortfalls. The ARNG 2019 NGREA approved buy list included a plan to purchase 49 Wreckers to increase EOH.

NGREA and Statutory Line Item funding over the past 6 years has enabled ARNG to complete modernization of the HMMWV Ambulance and the Tube-launched Optically tracked Wire-guided/ITAS HMMWV fleets, and has improved modernization levels of the Heavy Tactical Vehicle fleet.

Table 2-14. Army National Guard Top Sustainment Modernization Shortages

Nomenclature	Line Item Number	PUC	Quantity Shortage (FY 2020)	Total PUC Cost
Truck Cargo: 5T w/o winch[a]	T41515	$224K	265	$59.4M
M984A4 Wrecker[a]	T63161	$886K	103	$91.3M
CAT-V	Developmental	$1.1M	92	$101.2M

[a] CY 2020 CDU List. ARNG Pacing Item (Mission Critical equipment impacting readiness reporting).

5. Other: Funding for New and Displaced Equipment Training and NGREA

New Equipment Training (NET) and Displaced Equipment Training (DET) funding is based on new equipment quantities scheduled for fielding in any given year. In FY 2020, the ARNG received $31.1 million for NET/DET training events and activities, amounting to a slight increase over the previous year. In FY 2021, the ARNG received $27.3 million for NET/DET training events and activities, amounting to a slight decrease over the previous year. Historically, ARNG has executed all required NET/DET events by leveraging this and other National Guard Pay and Allowances resources. Limited training resources in support of new equipping efforts will continue to significantly impact unit readiness and result in the 54 states and territories and the District of Columbia utilizing other limited pay and allowance funds to support new equipment training.

The ARNG continues to utilize NGREA funding to mitigate readiness shortfalls in equipment and modernization efforts. These purchases support the ARNG's priority funding areas outside of the normal base budget. In FY 2019, ARNG NGREA funded more than $404.2 million in aviation, communications, domestic operations, installations, intelligence, logistics, and maintenance systems in support of Homeland Defense (HD) and Defense Support of Civil Authorities (DSCA) missions. The ARNG also invested $16.8 million of FY 2019 NGREA funding for the procurement of simulators and training systems to support both individual and collective training.

D. Summary

The ARNG will continue to ensure warfighting-capable and governor-responsive units are ready and available to support both combatant commanders and communities here at home. The strategic investment in modernization enables Citizen Soldiers to rapidly deploy, conduct contingency operations, and complete decisive-action training rotations at the Army's combat training centers. Currently, 58 percent of ARNG equipment is considered modern (combat-capable items that have completed their procurement phase), and 26 percent is considered most modern (still in procurement). ARNG enabling units, which contain the majority of ARNG CDU equipment, are filled with more than 50 percent least modern equipment.

The current Army modernization priorities require the ARNG to cross-level equipment within and between the 54 states and territories and the District of Columbia for deployments, degrading overall unit readiness. Although a balanced modernization strategy across Army components is ideal for all systems, ARNG assets are modernized only as fast as fiscal resources

allow. However, concurrent modernization in Mission Command systems must remain a priority to ensure interoperability.

The combined efforts of new procurement funding and cascaded equipment helps ensure the ARNG is **interoperable, sustainable, and deployable** with the Total Force. The ARNG will continue to support a balanced modernization strategy that provides capacity and capability for MDO and LSCO and safeguards its robust response capability for DOMOPS. Citizen Soldiers must be trained and equipped with the most modernized equipment to meet increasing domestic and global demands.

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2020 unit cost estimates are provided by the Military Departments.

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
AIR DEFENSE							
FIRE UNIT VEHICLE MOUNTED: (AVENGER)	F57713	$732,392	252	252	252	252	252
RAD ST ENHANCED AN/MPQ-64A3(V)1:	R05014	$4,176,000	72	68	64	64	64
RADIO SET: AN/USQ-140(V)2(C)	R42399	$300,000	91	93	95	95	95
Air Defense Airspace Management Battery CP	C17156	$1,956,426.00	4	6	6	6	6
Air Defense Airspace Management Air Battle Management Operations Center (ABMOC)	C77942	$2,595,824.00	1	1	1	1	1
Forward Area Air Defense Command & Control (FAAD C2) V5.5C-2.0	C91673	1,863,000	39	53	47	47	47
AIRCRAFT							
AIRPLANE CARGO-TRAN: C-12F*^	A30062	$3,068,422	26	26	33	33	33
CH-47F IMPROVED CARGO HELICOPTER:*	C15172	$30,000,000	156	156	156	156	156
HELICOPTER LIGHT UTILITY (LUH) UH-72A:*	H31329	$8,337,154	192	192	192	192	192
HELICOPTER UTILITY: UH-60L*	H32361	$16,967,644	480	480	480	480	486
HELICOPTER UTILITY: UH-60M*^	H32429	$21,812,860	298	300	214	214	300
HELICOPTER: ATTACK AH-64D	H48918	$3,276,000	72	71	71	71	72
MEDEVAC HELICOPTER: HH 60M*^	M33458	$16,967,644	104	105	97	97	105
CH-47F IMPROVED CARGO HELICOPTER:	C15172	$ 65,918,000	156	156	156	156	156
HELICOPTER ADVANCE ATTACK AH-64E: ^	H05006	$ 29,715,500	24	24	2	24	24
SMALL UNMANNED AIRCRAFT SYSTEM (SUAS): RAVEN B (MIP)	S83835	$21,889	742	742	742	742	822
TERMINAL VIDEO MULTIFUNCTIONAL REMOTE UAS: AN/USQ-210	T81951	$80,000	1,087	1,087	1,087	1,087	1,293
UNMANNED AIRCRAFT RQ-7BV2:	U05012	$738,194	108	108	108	108	108
AVIATION							
COMMAND SYSTEM: TACTICAL AN/TSQ-221*	C61597	$3,000,000	24	24	24	24	24
COMPUTER SYS: DIGITAL	C18391	$47,918	900	902	904	904	904
MOBILE TOWER SYSTEM: (MOTS)	M05009	$7,770,313	16	16	16	16	16
RADAR SET: AN/TPN31*	R17126	$3,701,502	15	15	15	15	16
TEST STAND ENGINE: SEMITRAILER -MTD ACFT DIAGNOSTICS FLEX ENG	T00229	$1,900,000	4	4	4	4	4
TESTER: PITOT AND STATIC SYSTEMSTS-4463/P*	T03597	$31,763	174	174	174	174	174
TOOL KIT AIRCRAFT MAINTENANCE: MOS 68J/68M BASIC	W59034	$1,620	247	250	250	250	250
TOOL SET AVIATION UNIT MAINTENANCE: SET NO 2 AIRMOBILE*	W60206	$389,000	41	41	41	41	41
UH-60 KIT AEROMEDICAL EVACUATION:*	K40878	$130,839	206	206	206	206	210
BATTLE CMD C2							
COMPUTER SET DIGITAL (JBC-P): AN/UYK-128B(V)3	C05036	$21,706	13,407	13,427	13,425	13,425	13,425
COMPUTER SET: DIGITAL (JBC-P LOG) AN/UYQ-90B(V)4	C05055	$8,342	3,355	3,357	3,357	3,357	3,357
COMPUTER SET: DIGITAL (JBC-P LOG) AN/UYQ-90B(V)5	C05054	$26,059	354	367	388	388	393
COMPUTER SET: DIGITAL (JBC-P) AN/GYK-62G	C05037	$28,347	733	734	745	745	753
COMPUTER SYSEM: DIGITAL*	C27963	$27,150	5,263	5,265	5,265	5,265	5,263
DISTRIBUTION SYSTEM ELEC: 120/208V 3PH 40AMP*	F55485	$8,850	1,291	1,301	1,311	1,311	1,321
DISTRIBUTION SYSTEM ELEC: 120V 1PH 60AMP*	F55553	$10,123	2,141	2,141	2,141	2,141	2,141

Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
FEEDER SYSTEM ELECTRICAL: 3PH 100 AMP	F55621	$12,885	459	461	461	461	461
FEEDER SYSTEM ELECTRICAL: 3PH 200 AMP	F55689	$17,280	93	93	93	93	93
GEN SET DED TM: 10KW 60HZ MTD ONM116A2 PU-798*	G42170	$19,177	897	897	897	897	897
GEN SET DED TM: 5KW 60HZ MTD ON M116A2 PU-797*	G42238	$25,135	662	656	653	653	647
GEN SET DID 5KW 50/60HZ: SKID-MTD*	G42488	$19,177	378	388	406	406	414
GEN SET: DED SKID MTD 10KW 400HZ*	G74779	$25,533	58	58	56	56	56
GEN SET: DED SKID MTD 10KW 60HZ*	G74711	$10,700	1,034	1,031	1,025	1,024	1,021
GEN SET: DED SKID MTD 15KW 50/60HZ*	G12170	$23,724	190	190	190	190	205
GEN SET: DED SKID MTD 30KW 50/60HZ*	G74575	$29,340	43	43	43	43	43
GEN SET: DED SKID MTD 5KW 60HZ*	G11966	$12,797	1,691	1,686	1,663	1,663	1,645
GEN ST D 10KW 400HZ: SKID-MTD	G75018	$25,533	58	58	56	56	56
GEN ST DE 30KWW 50/60HZ: SKID-MTD	G75200	$29,340	10	12	12	12	12
GEN ST DED15KWW 50/60HZ: SKID-MTD*	G49966	$23,724	60	61	62	62	62
GN ST DED 10KW 50/60HZ: SKID-MTD*	G07461	$25,533	620	707	824	824	824
GENERATOR SET DIESEL ENGINE TM: PU-802	G53778	$32,187	676	674	673	673	673
GENERATOR SET DIESEL ENGINE TM: PU-803	G35851	$41,800	137	135	134	134	134
GENERATOR SET: DIESEL TRL/MTD 60KW 50/60HZ PU805 CHASSIS W/FENDE	G78306	$47,007	111	111	111	111	111
LTT TRAILER-MTD: PP-3001/5 KW/50/60 HZ	L27002	$19,177	3	3	3	3	3
LTT TRAILER-MTD: PU-2001/5 KW/50/60 HZ	L26934	$25,135	495	502	506	506	512
LTT TRAILER-MTD: PU-2002/10 KW/50/60HZ	L84622	$19,177	597	637	631	631	619
LTT TRAILER-MTD: PU-2012/10 KW/400HZ	L84758	$45,443	10	10	9	9	9
NAVIGATION SET: SATELLITE SIGNALS AN/GSN-13	N96180	$67,088	4	4	4	4	4
NETT WARRIOR SYSTEM:	N05004	$12,457	765	721	226	226	226
POWER PLANT ELEC DED TM: 5KW 60HZ AN/MJQ-35*	P28083	$19,177	13	13	13	13	13
POWER PLANT: DIESEL TRL/MTD 10KW60HZ AN/NJQ-37*	P42262	$53,929	63	63	63	63	63
POWER PLANT: ELECTRIC TRAILER MTD 30KW 50/60HZ AN/MJQ 40*	P42126	$47,007	46	46	42	42	42
POWER PLANT: ELECTRIC TRL/MTD 60KW 50/60HZ AN/MJQ 41*	P42194	$96,819	32	32	32	32	32
TRAILER-MTD: PP-3102/10 KW/50/60HZ/M200A1	T39849	$72,145	81	81	81	81	136
TRAILER-MTD: PP-3105/30 KW/50/60 HZ 2M200A1	T39917	$47,007	41	41	48	48	48
TRAILER-MTD: PP-3106/60 KW/50/60 HZ/2M200A1	T93232	$47,007	81	81	99	99	101
TRAILER-MTD: PU-2101/15 KW/50/60 HZ/M200A1	T40090	$44,157	403	426	523	523	523
TRAILER-MTD: PU-2102/30 KW/50/60 HZ/M200A1	T39954	$41,800	141	141	170	170	170
TRAILER-MTD: PU-2103/60 KW/50/60 HZ/M200A1	T60034	$47,007	3	3	43	43	43
UTILITY RECEPTACLE:*	U89185	$5,457	3,110	3,122	3,120	3,120	3,120
BATTLESPACE AWARENESS							
CENTRAL: COMMUNICATIONS AN/TSQ-226(V)1	C43263	$535,000	8	8	8	8	8
CENTRAL: COMMUNICATIONS AN/TSQ-226(V)3*	C43399	$139,750	43	42	48	48	48
CENTRAL: COMMUNICATIONS AN/TSQ226(V)2	C43331	$800,000	2	2	2	2	2
COMPUTER SYSTEM: DIGITAL AN/PYQ-3	C18312	$32,000	262	262	224	224	224
COMPUTER: SYSTEM DIGITAL AN/PYQ-8	C77823	$10,330	229	229	197	197	197
DETECTING SYSTEM COUNTRMEASURES: AN/MLQ-40(V)4 (Prophet Sensor)	D04182	$1,400,000	59	59	59	59	89
DATA ANALYSI CENTRAL: AN/MSW-24 (Prophet Control)	D77801	$318,673	25	25	25	25	27
GROUND STATION TACTICAL INTELLIGENCE: AN/TSQ-179*	T37036	$4,644,000	37	35	39	39	39
PROCESSING CENTER INTELLIGENCE VERSION 2: AN/TYQ-103(V)*	C18176	$1,200,000	43	43	45	45	45
SERVER INTELLIGENCE FUSION: AN/TYQ-94(V)2*	A35397	$56,000	379	379	368	368	368

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WORKSTATION GEOSPATIAL INTELLIGENCE: AN/TYQ-71(V)*	D11498	$443,968	211	211	207	207	207
WORKSTATION PORTABLE MULTIFUNCTION: AN/TYQ-93(V)*	A35329	$4,000	2,406	2,413	2,407	2,407	2,407
BATTALION COMMAND POST SWITCHING GROUP: OM-XXX*	B67234	$8,838	511	512	512	512	512
CENTRAL OFFICE TELEPHONE ATOMATIC: AN/TTC-XXX	C18291	$900,000	8	8	8	8	8
COMMUNICATION SYSTEM: TACTICAL TERMINAL CONTROL SYSTEM (TTCS)*	C59125	$998,000	28	28	28	28	28
COMPUTER SET GENERAL: AN/GKY-33E	C18297	$3,500	482	482	482	482	482
ENCRYPTION-DECRYPTION EQUIPMEN: KG-175D	E05004	$9,900	2,647	2,635	2,686	2,686	2,686
JOINT NODE NETWORK (JNN) CENTRAL OFC TELEPHONE AUTO: AN/TTC*	J05001	$925,000	153	147	141	141	141
RECEIVE SUITE: AN/TSR-8*	R30658	$159,585	345	345	328	328	517
SATELLITE COMMUNICATION SYSTEM: AN/TSC-156*	S23268	$4,000,000	37	37	48	48	48
TERMINAL: SATELLITE COMMUNICATION AN/TSC-154	T81733	$4,411,733	111	111	111	111	111
CBT MOBILITY							
ANTI-PERSONNEL MINE CLEARING SYSTEM: REMOTE CONTROL (M160)	A05002	$11,143	26	26	26	26	26
ASSAULT BREACHER VEHICLE: (ABV)^	A05001	$5,200,583	18	18	20	20	30
BOAT BRIDGE ERECTION INBOARD ENGINE: SHALLOW DRAFT*	B25476	$224,258	84	84	84	84	84
BRIDGE ARMORED VEHICLE LAUNCHED SCISSORS TY: 63 FT (AVLB) MLC 70*	B31098	$7,645,450	68	68	68	68	86
BRIDGE FIXED: RAPIDLY	B24592	$1,302,000	8	8	8	8	8
DETECTING SET MINE: PTBL METALLIC (AN/PSS-11)	G02341	$24,641	224	224	224	224	224
DETECTING SET: MINE AN/PSS-14	D03932	$24,641	3,211	3,211	3,211	3,211	6,906
DETECTING SET: MINE AN/PSS-14C	D05016	$14,000	24	24	24	24	24
HIGH MOBILITY ENGINEER EXCAVATOR (HMEE): TYPE I*^	H53576	$458,000	461	461	450	450	461
INSTRUMENT SET RECONNAISSANCE AND SURVEYING: AN/TKQ-5	D17191	$79,880	1,037	1,037	1,058	1,058	1,058
LAUNCH M60 SERIES TANK CHASS TRNSPTG: 40 AND 60 FT BRDGE TY CL60*	L43664	$527,126	86	86	86	86	86
LOADER SCOOP TYPE: 2.5 CUBIC YARD*	L76897	$99,516	111	111	111	111	111
LOADER SCOOP TYPE: DSL 2-1/2CU YD HINGE FRME W/MULTI PURP BUCKET*	L76556	$141,500	30	30	30	30	41
MINE PROTECTED CLEARANCE VEHICLE:	M05004	$1,451,707	78	78	78	78	78
MINE RESISTANT VEHICLE:	M74226	$540,000	59	59	59	59	95
SOF DEMOLITION KIT: M303	S93791	$31,671	308	308	308	308	362
SUPPLEMENTARY SET BRIDGE:	U60216	$90,852	22	22	22	22	22
TRANSPORTER: COMMON BRIDGE (CBT) M1977A4	T05067	$470,094	8	8	8	8	8
TOOL KIT: URBAN OPS	T30195	$76,364	703	703	663	663	703
TRACTOR WHEELED: DSL 4X4 W/EXCAVATOR AND FRONT LOADER*	T34437	$328,201	7	7	7	7	7
TRACTOR WHEELED: INDUSTRIAL*	T34505	$328,201	194	194	194	194	194
TRANSPORTER COMMON BRIDGE:*	T91308	$280,613	584	584	584	584	616
URBAN OPERATIONS: PLATOON KIT	U88092	$177,553	478	478	413	413	525
VEHICLE MOUNTED MINE DETECTION (VMMD) SYS:	V05001	$2,828,522	156	156	156	156	156
FIELD LOG							
ARMAMENT REPAIR SHOP SET (ARSS):	A05031	$408	35	35	35	35	35
ASSAULT KTCHN: (AK)	A94943	$65,000	676	676	650	650	913
CALIBRATION SET SECONDARY TRANSFER: STANDARDS	C72574	$713,335	7	7	7	7	12
FORWARD AREA WATER POINT SUPPLY SYSTEM: (FAW SS)*	F42612	$151,958	46	46	46	46	46
HYDRAULIC SYS TEST AND REPAIR UNIT (MX3):	H05002	$153,417	234	234	234	234	248
LIGHT CAPABILITY ROUGH TERRAIN FORKLIFT (LCRTF): 5K*	L05010	$113,280	475	501	501	501	501
LOAD HANDLING SYS (LHS): 2000 GAL COMP WATER TANK-RACK (HIPPO)*	T32629	$130,293	531	615	454	454	1,162
MACHINIST'S MEASURING TOOL SET: MMTS	M20190	$1,149	888	888	888	888	967
MAINTENANCE SUPPORT DEVICE:*	T92889	$22,901	9,226	9,226	9,226	9,226	11,902
MODULAR FUEL SYSTEM-TANK RACK MODULE: WITH RETAIL CAPABILITY	T20131	$78,038	1,446	1,452	817	817	1,455
PETROLEUM QUALITY ANALYSIS SYSTEM: ENHANCED (PQAS-E)	P25743	$1,770,000	15	15	15	15	18

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TEST KIT MASK PROTECTIVE: M41	T62350	$7,790	1,093	1,102	1,104	1,104	1,104
TRAILER TANK WATER (CAMEL): 800 GAL 5 TON W/E	T05047	$106,532	123	123	113	113	113
TRANSFER SET: STANDARDS (SUP/EQ) AN/GSM-439	T05046	$151,469	5	5	5	5	12
TRANSFER: SET STANDARDS AN/GSM-440	T05045	$713,335	5	5	5	5	12
WATER PURIFICATION: REVERSE OSM-OSIS 3000 GPH TRAILER MOUNTED*	W47225	$455,871	69	69	69	69	72
FORCE PROTECTION							
ALARM BIOLOGICAL AGENT AUTOMATIC: (BIDS) M31A2*	A48680	$1,408,429	98	98	98	98	98
DECONTAMINATING APPARATUS POWER DRIVEN SKID MOUNTED: MULTIPURPOS	F81880	$29,500	84	84	84	84	84
JOINT SERVICE: TRANSPORTABLE DECONTAMINATION	J01197	$0	1,431	1,431	1,431	1,431	1,431
NUCLEAR BIO CHEM RECON VEH: (NBC RV)*	N96543	$8,024,127	69	69	69	69	77
GEN ENGINEERING							
ALL TERRAIN CRANE TYPE II: (HEAVY)*	Z05089	$1,628,875	1	1	1	1	1
COMPACTOR HIGH SPEED: TAMPING SELF-PROPELLED (CCE)*	E61618	$135,186	62	62	62	62	62
CRANE: WHEEL MOUNTED HYDRAULIC 25 TON ALL TERRAIN AT422T*	C36586	$382,000	109	109	109	109	116
CRUSH SCREEN AND WASH PLANT: DSL/ELEC DRVN WHL MTD 150-225 TPH	F49673	$2,766,000	7	7	7	7	7
EXCAVATOR: HYDRAULIC (HYEX) TYPE I MULTIPURPOSE CRAWLER MOUNT*	E27792	$348,371	115	115	115	115	194
EXCAVATOR: HYDRAULIC (HYEX) TYPE II MLTIPURPOSE CRAWLER MOUNT*	E41791	$354,259	7	7	7	7	7
EXCAVATOR: HYDRAULIC (HYEX) TYPE III MULTIPURPOSE CRAWLER MOUNT*	E27860	$354,259	7	7	7	7	7
HYDRAULIC ELECTRIC PNEUMATIC PETROLEUM OPERATE EQUIP: (HEPPOE)	H05004	$230,000	378	378	378	378	378
MIXER CONCRETE MODULE: PLS 2600 GALLON	M81382	$127,160	34	34	34	34	39
ROLLER MOTORIZED STEEL WHEEL: 2 DRUM TANDEM 10-14 TON (CCE)*	S11711	$82,595	16	16	16	16	16
ROLLER MOTORIZED: VIBRATORY ROLLER TYPE II*	R11127	$88,000	211	211	211	211	211
SCRAPER EARTH MOVING SELF-PROPELLED: 14-18 CU YD (CCE)*^	S56246	$745,000	1	1	1	1	1
SCRAPER EARTHMOVING: 14-18 CU YD^	S05029	$796,100	237	237	237	237	297
SCRAPER ELEVATING: SELF PROPELLED 9-11 CU YD SECTIONALIZED*	S30039	$441,923	118	118	118	118	132
SELF PROPELLED CONCRETE SAW	Z05126	$100,000	5	5	2	2	18
TACTICAL WATER DISTRIBUTION EQUIP SET: (TWDS-RDF)*	T09094	$350,000	2	2	2	2	4
TRACTOR FL TRKD: LOW SPD - T9 TYPE II W/RIPPE	T05016	$325,000	189	189	189	189	189
TRACTOR FL TRKD: LOW SPD T-5 TYPE II W/RIPPER	T05026	$311,000	72	72	72	72	72
TRACTOR FULL TRACKED HIGH SPEED: ARMORED COMBAT EARTHMOVER (ACE)*	W76473	$887,050	48	48	48	48	54
TRACTOR FULL TRACKED HIGH SPEED: DEPLOYABLE LT ENGINEER (DEUCE)*^	T76541	$398,000	104	104	104	104	124
TRACTOR FULL TRCKD LOW SPD: T5	T05029	$311,000	66	66	66	66	68
TRACTOR FULL TRKD LOW SPD: T9*	T05015	$325,000	219	219	219	219	219
MANEUVER CBT VEH							
ANTI-TANK GUIDED MISSILE VEH: (ATGM)	A83852	$5,696,258	18	18	18	18	18
CARRIER 120 MILLIMETER MORTAR: SELF PROPELLED ARMORED	C10990	$511,343	90	90	90	90	90
CARRIER ARMORED COMMAND POST: FULL TRACKED^	C11158	$374,086	356	356	356	356	412
CARRIER CARGO TRACKED: 1.5T M973	C11280	$125,969	12	12	12	12	12
CARRIER COMMAND COMMUNICATION VEHICLE: ARTICULATED TRKD 1-1/2 T	C11651	$209,490	4	4	4	4	4
CARRIER COMMAND POST: LIGHT TRACKED	D11538	$345,787	67	67	67	67	67
CARRIER PERSONNEL FULL TRACKED: ARMORED (RISE)	C18234	$511,343	585	585	585	585	585
COMMAND VARIANT VEH: (CV)	C41314	$3,725,807	64	64	64	64	64
ENGINEER SQUAD VEHICLE: (ESV)	J97621	$3,839,417	24	24	24	24	24
FIGHTING VEHICLE: FULL TRACKED INFANTRY (IFV) M2A3	F60564	$6,661,335	250	250	250	250	250
FIRE SUPPORT VEHICLE: (FSV)	F86821	$3,694,633	26	26	26	26	26
INFANTRY CARRIER: VEHICLE (ICV)	J22626	$3,704,123	260	260	260	260	260

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KNIGHT: ARMORED	K29708	$1,718,004	60	60	60	60	60
MEDICAL EVACUATION VEHICLE: (MEV)*	M30567	$3,785,691	54	54	54	54	54
MOBILE GUN SYSTEM: (MGS)	M57720	$7,060,155	24	24	24	24	24
MORTAR CARRIER VEHICLE: (MCV)	M53369	$3,935,629	72	72	72	72	72
OPERATION DESERT STORM (ODS) SITUATIONAL AWARENESS (SA): M2A2	P19727	$3,006,569	375	375	375	375	375
RECONNAISSANCE VEH: (RV)^	R62673	$2,544,614	104	104	104	104	114
RECOVERY VEHICLE FULL TRACKED: HEAVY M88A2	R50885	$4,022,474	167	167	167	167	175
RECOVERY VEHICLE FULL TRACKED: MEDIUM	R50681	$3,593,524	142	143	144	144	144
TANK COMBAT FULL TRACKED: 120 MILLIMETER GUN	T13168	$7,598,833	261	261	261	261	261
TANK COMBAT FULL TRACKED: 120MM GUN M1A2	T13305	$7,598,833	160	160	160	160	174
MANEUVER SYSTEMS							
SURVEILLANCE SYSTEM: SCOUT LONG RANGE AN/TAS-8*	S02976	$514,063	737	737	737	737	737
TARGET ACQUISITION SYSTEM: TOW IMPROVED ITAS M41	T24690	$970,000	720	720	720	720	720
MEDICAL FIELD SYSTEMS							
ANALYZER BLOOD: (AB)	A83359	$10,498	203	203	203	203	203
AUTOMATIC EXTERNAL DEFIBRILLATOR (AED) :	A05034	$3,988	223	194	194	194	194
COMPUTER SET: DIGITAL AN/TYQ-106(V)1	C18345	$3,832	1,960	1,960	1,960	1,960	1,960
COMPUTER SET: DIGITAL AN/TYQ-107(V)1	C18277	$4,282	1,598	1,598	1,598	1,598	1,598
COMPUTER SET: DIGITAL AN/TYQ-107(V)2	C18209	$4,121	323	323	304	304	323
COMPUTER SYSTEM: DIGITAL AN/TYQ-105(V)1	C27503	$1,700	0	20	40	40	40
COMPUTER SYSTEM: DIGITAL AN/TYQ-108(V)3	C27639	$4,462	452	452	452	452	452
DEFIBRILLATOR MONITOR RECORDER: 120/230V 50/60HZ AC OR DC*	D86072	$38,868	823	823	807	807	826
DENTAL FIELD TREATMENT OPERATING SYSTEM:	D44052	$63,629	68	68	68	68	68
DENTAL FILMLESS IMAGING SYSTEM (DFIS):	D44302	$17,050	67	67	67	67	67
ELECTROCARDIOGRAPH: SOLID STATE AMPLIFIER PORT115V 60HZ AC	E17591	$4,943	73	74	74	74	74
MEDICAL EQUIPMENT SET AIR AMBULANCE:*	M29213	$256,166	315	315	315	315	315
MEDICAL EQUIPMENT SET GROUND AMBULANCE:*	M26413	$59,487	1,816	1,816	1,816	1,816	1,816
MEDICAL EQUIPMENT SET TACTICAL COMBAT MEDICAL CARE:*	M30499	$227,035	867	867	867	867	867
MEDICAL EQUIPMENT SET WATER QUAL ANALYSIS PREVENTIVE MEDICINE:*	Y36849	$24,034	50	50	50	50	50
MEDICAL FILMLESS IMAGING SYS:	M30817	$160,147	76	76	76	76	76
MONITOR PATIENT VITAL SIGNS: (MVS)	M66626	$18,119	314	314	314	314	314
OXYGEN GENERATOR: FIELD PORTABLE (OGFP)	P05027	$8,190	671	671	1,388	1,388	1,388
PUMP INTRAVENOUS INFUSION PIV:	P16161	$7,425	755	855	762	762	888
REFRIGERATOR SOLID STATE BIO:*	R64126	$8,456	181	182	182	182	182
SINK UNIT SURGICAL SCRUB AND UTENSIL HOSPITAL FIELD: 110V 60C AC*	T60464	$8,359	144	144	144	144	144
STERILIZER SURG INSTR DRESS: PRES EXTR HTDCRS 12-1/2 BY 12-1/2IN	U39016	$841	136	136	136	136	136
ULTRA SOUND DIAGNOSTIC SYSTEM: HAND-CARRIED	U26813	$63,772	9	9	9	9	9
VENTILATOR VOLUME PTBL:*	V99788	$20,174	680	680	680	680	680
X-RAY: APPARATUS DEN*	X38819	$6,532	67	67	67	67	67
ROBOTICS							
Man Transportable Robotic System MTRS	M05002	$182,154	159	159	159	159	261
Medium Flail	M05031	$664,971	6	6	6	6	6
SOLDIER SYSTEMS							
ILLUMINATOR INTEGRATED: SMALL ARMS STORM MLRF	J68653	$13,090	3,059	3,895	5,093	5,093	5,093
LASER: TARGET LOCATOR MODULE	L05003	$43,241	3,178	3,613	2,300	2,300	3,704
MANEUVERABLE CANOPY 6 (MC 6): PERSONNEL PARACHUTE SYSTEM	A46878	$5,140	5,403	7,866	7,866	7,866	7,866
MILITARY: FREEFALL ADVANCED RAM AIR PARACHUTE SYSTEM	M05026	$13,700	558	558	558	558	558

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SOLDIER WPNS							
CARBINE 5.56 MILLIMETER: M4A1	C06935	$1,772	203,522	203,522	207,436	207,436	258,336
M205: MACHINE GUN TRIPOD	X05002	$4,013	15,176	15,212	15,223	15,223	15,223
MOUNT TRIPOD MACHINE GUN: HEAVY CALIBER 50	M75577	$4,013	7,630	7,643	7,678	7,678	7,678
RIFLE RECOILLESS: 84MM (MAAWS)	R45101	$129,016	161	161	161	161	266
RIFLE 5.56 MILLIMETER: M16A2*	R95035	$1,773	90	90	90	90	422
STRIKE							
A3 BFIST: W/FS3	A70576	$1,500,000	26	26	26	26	65
HIGH MOBILITY ARTILLERY ROCKET SYSTEM: HIMARS	H53326	$7,153,000	192	192	192	192	192
HOWITZER LT TOWED: M119A3^	H05007	$1,400,000	228	228	228	228	240
HOWITZER MEDIUM SELF PROPELLED:	H57642	$1,435,000	210	210	210	210	228
HOWITZER MEDIUM TOWED: M777	H57916	$3,571,429	240	240	240	240	240
LIGHTWEIGHT COUNTER MORTAR RADR: AN/TPQ-50	L05007	$1,200,000	124	124	124	124	124
MULTIPLE LAUNCH ROCKET SYSTEM: (MLRS) M270A1 IMPROVED LAUNCHER	M82581	$8,243,000	32	33	54	54	54
RADAR SET: AN/TPQ-36(V)10	R14284	$7,977,850	10	10	9	9	9
RADAR SYSTEM: COUNTER FIRE TARGET ACQUISITION RADAR	R05016	$14,231,348	29	31	31	31	56
SUPPORT SYSTEMS							
CONTAINER HANDLING:*	C27294	$64,000	679	679	679	679	823
CONTAINER HANDLING: HEAVY EXP MOBIL TACT TRK (HEMTT)*	C84930	$42,249	8	8	8	8	8
FIRING DEVICE DEMOLITION: MK152 MOD 0	F60336	$43,311	338	338	338	338	406
JOINT PRECISION AIRDROP SYS: (JPADS) 10K	J05004	$81,000	34	34	34	34	34
PLATFORM: CONTAINER ROLL IN/ROLL OUT*	B83002	$8,250	14,659	14,659	14,659	14,659	17,175
TRAILERS							
PALLETIZED LOAD SYSTEM: TRAILER-CTE^	P05025	$133,000	578	572	574	574	574
SEMITRAILER FLAT BED: BREAKBULK/CONT TRANSPORTER 22-1/2 TON*	S70027	$42,678	3,406	3,406	3,406	3,406	3,406
SEMITRAILER FLATBED: BREAKBULK/CONTAINER TRANSPORTER CMRCIAL 34T*	S70159	$105,069	2,588	2,664	2,419	2,419	3,960
SEMITRAILER LOW BED: 25 TON 4 WHEEL W/E*	S70517	$179,778	206	251	377	377	510
SEMITRAILER LOW BED: 40 TON 6 WHEEL W/E	S70594	$104,444	1,182	1,182	1,182	1,182	1,182
SEMITRAILER LOW BED: 70 TN HEAVY EQUIPMENT TRANSPORTER (HET)	S70859	$610,664	420	420	420	420	420
SEMITRAILER TANK: 5000 GAL BULK HAUL SELF-LOAD/UNLOAD W/E*	S10059	$85,000	300	300	300	300	300
SEMITRAILER TANK: 5000 GAL FUEL DISPENSING AUTOMOTIVE W/E*	S73372	$97,000	139	139	139	139	139
TRAILER CARGO: 1-1/2 TON 2 WHEEL W/E	W95811	$50,433	48	48	48	48	82
TRAILER CARGO: MTV W/DROPSIDES M1095*	T95555	$50,433	6,006	5,995	5,984	5,984	5,984
TRAILER: PALLETIZED LOADING 8X20*^	T93761	$88,639	5,149	5,149	5,149	5,149	5,253
TRUCKS							
M-ATV UI W/CROW SYSTEM:	M05029	$0	94	94	94	94	94
M-ATV UI W/OGPK: ^	M05030	$575,000	190	190	190	190	215
TRACTOR LIN HAUL: M915A5*	T88858	$162,968	987	987	987	987	1,860
TRUCK AMBULANCE: 2 LITTER ARMD 4X4 W/E (HMMWV)	T38707	$397,000	1	1	1	1	1
TRUCK AMBULANCE: 4 LITTER ARMD 4X4 W/E (HMMWV)*	T38844	$96,466	1,616	1,616	1,616	1,616	1,616
TRUCK CARGO: 2 1/2 TON 4X4 LMTV W/E W/W LAPES/AD	T42063	$203,039	3	3	3	3	8
TRUCK CARGO: 4X4 LMTV W/E	T60081	$157,982	2,995	2,995	2,995	2,995	3,066
TRUCK CARGO: 5 TON 6X6 MTV W/E LAPES/AD	T41036	$210,180	69	69	69	69	103
TRUCK CARGO: 5 TON 6X6 MTV W/E W/W LAPES/AD	T41104	$220,616	12	12	12	12	17
TRUCK CARGO: 5 TON WO/WINCH*	T41515	$301,989	5,218	5,201	5,156	5,156	5,156

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TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10*	T40999	$1,075,209	619	619	619	619	842
TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10 W/MHE W/E*	T41067	$1,075,209	72	66	66	66	66
TRUCK CARGO: MTV W/E*	T61908	$255,952	1,544	1,497	1,493	1,493	1,493
TRUCK CARGO: MTV W/E W/W*	T41135	$255,952	371	371	371	371	615
TRUCK CARGO: W/MHE WO/WINCH	T59584	$374,498	610	610	611	611	617
TRUCK CARGO: WO/WINCH*	T59448	$270,372	3,670	3,664	3,666	3,666	3,666
TRUCK DUMP: 10 TON WO/WINCH*	T65342	$332,656	1,121	1,113	1,113	1,113	1,113
TRUCK DUMP: 20 TON DSL DRVN 12 CU YD CAP (CCE)*	X44403	$211,764	555	555	555	555	597
TRUCK DUMP: MTV W/E	T64911	$242,585	3	3	3	3	16
TRUCK DUMP: MTV W/E W/W	T64979	$383,786	0	0	0	0	3
TRUCK PALLETIZED LOADING: M1074A1	T55236	$836,000	133	133	137	137	193
TRUCK TRACTOR: M107A1	T05012	$550,000	420	420	420	420	420
TRUCK TRACTOR: (LET)*	T60946	$616,000	1,176	1,176	1,176	1,176	1,176
TRUCK TRACTOR: LET 6X6 66000 GVW W/W C/S*	T91656	$250,614	14	14	14	14	14
TRUCK TRACTOR: LINE HAUL C/S 50000 GVWR 6X4 M915*	T61103	$162,968	180	180	180	180	180
TRUCK TRACTOR: MTV W/E*	T61239	$262,509	845	842	837	837	837
TRUCK TRACTOR: MTV W/E W/W*	T61307	$242,669	100	100	100	100	199
TRUCK TRACTOR: WO/WINCH*	T88983	$294,509	2,093	2,092	2,088	2,088	2,088
TRUCK UTILITY: ECV ARMAMENT CARRIER W/IAP ARMOR READY M1151A1*	T34704	$129,376	5,514	5,519	5,500	5,500	5,690
TRUCK WRECKER:*^	T94671	$532,292	658	654	648	648	648
TRUCK WRECKER: M984A4*^	T63161	$763,000	681	685	690	690	690
TRUCK WRECKER: MTV W/E W/W*	T94709	$502,537	83	83	83	83	83
TRUCK WRECKER: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/WINCH*	T63093	$886,000	364	361	357	357	359
TRUCK: PALLETIZED LOADING*	T81874	$678,000	628	628	848	848	895
1. "*" indicates a Critical Dual Use (CDU) equipment item 2. "^" indicates a Pacing (ERC P) equipment Item impacting readiness reporting							

ARNG
Average Age of Equipment

Table 2

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021. Logistics Information Warehouse Data Base (LIWDB) convergence with Program Manager (PM) Army Enterprise System Integration Program (AESIP) in 2018 resulted in the inability to retrieve Average Age of Equipment data. This affects the validity of data in ARNG Table 2 Average Age of Equipment.

Nomenclature	Equip No.	Average Age	EUL	Remarks
Aircraft				
Helicopter Cargo Transport: CH-47D	H30517	8	17-25	
Helicopter Light Utility (LUH): UH-72A	H31329	9	17-25	
Helicopter Utility: UH-60L	H32361	28	17-25	Past EUL (economic useful life)
Helicopter Utility: UH-60M	H32429	13	17-25	
Helicopter Attack: AH-64D	H48918	16	17-25	
Helicopter Utility: UH-60A	K32293	37	17-25	Past EUL
Airplane Cargo Transport: C-12D	A29812	36	17-25	Past EUL
Airplane: Cargo Transport C-26	A46758	27	17-25	Past EUL
Airplane: Cargo Transport	BA108Q	26	17-25	Past EUL
Aviation				
Aviators Night Vision Imaging System: AN/AVS-6(V)1	A06352	16	8-15	Past EUL
Battle Command and Control (C2)				
Generator Set: DED Skid-mtd 5kW 60Hz	G11966	16	17-25	
Generator Set: DED TM PU-803	G35851	16	17-25	
Generator Set: DED: 60Hz AC MEP-531A	G36237	18	17-25	
Generator Set: DED TM 10kW 60Hz	G42170	16	17-25	
Generator Set: DED TM 5kW 60Hz	G42238	15	17-25	
Generator Set: DED Trailer-mtd (TM) PU-802	G53778	15	17-25	
Generator Set: DED Skid-mtd 10kW 60Hz	G74711	14	17-25	
Generator Set: DED TM 60kW 50/60Hz PU805 Chassis	G78306	19	17-25	
Generator Set: DED TM 15kW 60Hz	G78374	15	17-25	
Power Plant: Electric TM 30kW 50/60Hz AN/MJQ-40	P42126	16	17-25	
Power Plant: Diesel TM 10kW 60Hz AN/NJQ-37	P42262	19	17-25	
Combat Mobility				
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	24	17-25	
Cradle: Improved Boat (IBC) M14	C33925	15	17-25	
Interior Bay Bridge Floating	K97376	17	17-25	
Launch M60 Series Tank Chassis Transpt: 40/60ft Bridge	L43664	35	17-25	Past EUL
Loader Scoop Type: DSL 2-1/2 cu yd w/Multi Purp Bucket	L76556	35	15-40	
Pallet: Bridge Adapter (BAP) M15	P78313	13	17-25	
Ramp Bay Bridge Floating	R10527	18	17-25	
Tractor Wheeled: DSL w/Excavator & Front Loader	T34437	31	15-40	
Transporter Common Bridge	T91308	19	17-25	

ARNG
Average Age of Equipment

Table 2

Nomenclature	Equip No.	Average Age	EUL	Remarks
Field Logistics				
Containerized Kitchen (CK)	C27633	12	17-25	
Truck Lift Fork: Variable Reach Rough Terrain	T73347	12	17-25	
Water Purification: Reverse Osmosis 3Kgph TM	W47225	25	17-25	
General Engineering				
Crane: Whl-mounted Hydraulic 25-ton All Terrain AT422T	C36586	19	15-40	
Distributor Water Tank Type: 6K-gal Semitrailer-mtd (CCE)	D28318	35	17-25	Past EUL
Excavator: Hydraulic (HYEX) Type I	E27792	20	15-40	
Excavator: Hydraulic (HYEX) Type II	E41791	18	15-40	
Compactor High Speed: Tamping Self-Propelled (CCE)	E61618	21	15-40	
Grader Road Motorized: DED Heavy (CCE)	G74783	35	15-40	
Fire Fighting Equipment Set: TM Multipurpose	H56391	35	15-40	
Scraper Elevating: SP 9-11 cu yd sectionalized	S30039	12	15-40	
Scraper Earth Moving: SP 14-18 cu yd (CCE)	S56246	35	15-40	
Tractor FT HS: Deployable Lt Engineer (DEUCE)	T76541	18	15-40	
Tractor FT LS: DSL Med DBP w/Buldoz w/Scarif Winch	W76816	40	15-40	
Tractor FT LS: DSL Med DBP w/Buldoz w/Scarif Ripper	W83529	33	15-40	
Maneuver Combat Vehicles				
Carrier Personnel Full Tracked: Armored (RISE)	C18234	34	25-30	Past EUL
Bradley Fighting Vehicle M2A2 ODS SA	P19727	24	25-30	
Bradley Fighting Vehicle M2A3	F60564	28	25-30	
Fire Support Vehicle (FSV)	F86821	15	25-30	
Infantry Carrier Vehicle (ICV)	J22626	13	25-30	
Engineer Squad Vehicle (ESV)	J97621	13	25-30	
Mortar Carrier Vehicle (MCV)	M53369	16	25-30	
Mobile Gun System (MGS)	M57720	13	25-30	
Recovery Vehicle Full Tracked: Medium M88A1	R50681	42	25-30	Past EUL
Recovery Vehicle Full Tracked: Medium M88A2	R50885	14	25-30	
Tank Combat Full Tracked M1A1	T13168	27	25-30	
Tank Combat Full Tracked M1A2	T13305	27	25-30	
Strike				
Carrier Ammunition Tracked Vehicle (CATV)	C10908	28	25-30	
Howitzer Light Towed: M119A3	H05007	7	25-50	
Howitzer Medium Self Propelled M109A6	H57642	31	25-50	
Howitzer Towed: M777	H57916	10	25-50	
Support Systems				
Container Platform: Roll-In/Roll-Out	B83002	25	17-25	
Container Handling Unit (CHU)	C84862	14	17-25	
Trailers				
Semitrailer Tank: 5K-gal Bulk Haul Self-Load/Unload	S10059	19	20-25	

ARNG
Average Age of Equipment

Table 2

Nomenclature	Equip No.	Average Age	EUL	Remarks
Semitrailer Flatbed: Breakbulk/Cont Transporter 22-1/2-ton	S70027	25	20-25	
Semitrailer Flatbed: Breakbulk/Container Transporter 34-ton	S70159	29	20-25	
Semitrailer Low-bed: 40-ton 6-wheel	S70594	29	20-25	
Semitrailer Low-bed: 70-ton Heavy Equip Transporter (HET)	S70859	19	20-25	
Semitrailer Tank: 5K-gal Fuel Dispensing Automotive	S73372	25	20-25	
Trailer Flatbed: 11-ton 4-wheel (HEMAT)	T45465	19	20-25	
Trailer: Palletized Loading 8X20	T93761	13	20-25	
Trailer Cargo: MTV W/Dropsides M1095	T95555	9	20-25	
Trailer Cargo: High Mobility 1-1/4-ton	T95924	11	20-25	
Trailer: Light Tactical 3/4-ton	T95992	11	20-25	
Trailer Flatbed: M1082 Cargo LMTV w/Dropsides	T96564	11	20-25	
Trucks				
Truck Utility: Heavy Variant (HMMWV) 10K GVW	T07679	20	20-25	
Truck Utility: ECV Armament Carrier M1151A1	T34704	11	20-25	
Truck Utility: M1152A1	T37588	10	20-25	
Truck Ambulance: 4 Litter Armored (HMMWV)	T38844	20	20-25	Full buy out, older vehicles to be divested upon receipt.
Truck Cargo: Tactical HEMTT w/Lt Crane W/W	T39518	32	20-25	Past EUL
Truck Cargo: Tactical HEMTT w/Med Crane	T39586	26	20-25	
Truck Cargo: Tactical HEMTT w/Med Crane W/W	T39654	29	20-25	Past EUL
Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10	T40999	16	20-25	
Truck Cargo: Heavy PLS Transporter 15-16.5 ton w/MHE	T41067	25	20-25	
Truck Cargo: MTV W/W	T41135	15	20-25	
Truck Cargo: MTV w/MHE	T41203	15	20-25	
Truck Utility : M1165A1	T56383	10	20-25	
Truck Tank: Fuel Servicing 2500G HEMTT W/W	T58161	25	20-25	
Truck Tank: Fuel Servicing 2500G HEMTT W/W M978A4	T58318	12	20-25	
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	22	20-25	
Truck Cargo: Tactical HEMTT w/Lt Crane	T59278	31	20-25	Past EUL
Truck Cargo: Tactical HEMTT w/Med Crane M985A4	T59380	14	20-25	
Truck Cargo: LMTV	T60081	15	20-25	
Truck Cargo: LMTV W/W	T60149	15	20-25	
Truck Tractor: Tactical HEMTT M983A4	T60946	8	20-25	
Truck Tractor: Line Haul C/S 50000 GVW 6X4 M915	T61103	24	20-25	
Truck Tractor: MTV	T61239	10	20-25	
Truck Tractor: MTV W/W	T61307	15	20-25	
Truck Cargo: MTV LWB	T61704	15	20-25	
Truck Cargo: MTV	T61908	14	20-25	
Truck Wrecker: Tactical HEMTT W/W	T63093	21	20-25	
Truck Wrecker: Tactical HEMTT W/W M984A4	T63161	13	20-25	

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Table 2

Average Age of Equipment

Nomenclature	Equip No.	Average Age	EUL	Remarks
Truck Dump: MTV	T64911	23	20-25	
Truck Tank: Fuel Servicing 2500G HEMTT	T87243	21	20-25	
Truck Tractor: LET 6X6 66000 GVW W/W C/S	T91656	19	20-25	
Truck Van: LMTV	T93484	14	20-25	
Truck Wrecker: MTV W/W	T94709	14	20-25	
Truck Cargo: Tactical 8X8 HEMTT w/LHS	T96496	14	20-25	
Truck Dump: 20-ton DED 12 cu yd Cap (CCE)	X44403	27	20-25	Past EUL

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Table 3

Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2022 would be expected to arrive in RC inventories in FY 2023 or FY 2024. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2020[2]
FY 2019 NGREA Equipment			
Aviation			
Removable Door Pins UH-72	$652,536		
External Rescue Hoist UH-60M	24,750,000		
Firefighting Bucket Kits	15,960,000		
Hydraulic Test Equipment	918,600		
Deployment Support Kits (Tool Kits) (UH-60M)	11,020,000		
Communication			
Phase I and Phase II Block 2 Modernization	18,200,000		
ARNG Armory SIPR Expansion	13,392,000		
Armory-Level Commercial Wireless Access	13,872,000		
High-Frequency Radio	3,016,000		
Radio Set: Handheld Radio	21,000,000		
Tactical Media Acquisition Kit	9,200,000		
Domestic Operations			
WMD-CST TOC Trailer	4,410,000		
STORZ Video Laryngoscope	941,127		
Portable Ventilator	991,126		
Physiological Monitors	3,420,000		
Small Unit Support Vehicles	800,000		
Intelligence			
Sensitive Compartmented Information (SCIF) Equipment	6,000,000		
Foundry STRAP	5,100,000		
Stratomist	4,500,000		
Versatile Radio Observation & Direction (VROD) System	2,000,000		
Field Docking Station, Intermec Tethered	5,221,900		
Engineering			
Surveying Set General Purpose	1,929,600		
All-Terrain Crane, Type II (50 ton Heavy)	30,360,000		
Hydraulic Excavator	5,800,000		
VSECK Type II Carpenter Supplemental Tool Kit	3,979,400		
VSECK Type VI Plumbers and Pipefitters Tool Kit	9,390,300		
Installations			
Truck Firefighting: Powered Pumper 750 to 1250 GPM	4,059,600		
Truck Firefighting: Pumper and Rescue	1,718,740		
Truck Firefighting: Airfield Crash/Rescue 4x4	581,400		
Heavy Duty Snow Plow	346,500		
Truck Firefighting: 100F Ladder w/Pump Backhoe	2,024,572		
Fire Truck, Bulldog 4x4 Production Brush Truck	3,852,500		

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2019	FY 2020[1]	FY 2020[2]
Logistics			
Modular Fuel System-Tank Rack Module	93,000		
Maintenance			
Maintenance Support Device	136,152,016		
Training			
Ground-Based Air Surveillance Radar System S200H	745,000		
Target Fire Ranges	6,739,600		
Laser Live Fire Range	995,000		
Training/Aviation			
Black Hawk Maintenance Trainer (BHMT-M) UH-60M	8,289,765		
Transportation			
HEMTT Wrecker M984A4	24,077,718		
Semi-Trailer Flatbed, 34 Ton	14,500,000		
Total	**$421,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

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Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the potential equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 QTY	FY 2023 QTY	FY 2024 QTY
AIRCRAFT				
HELICOPTER ADVANCE ATTACK AH-64E	H05006	0	0	0
HELICOPTER UTILITY: UH-60L	H32361	75	31	0
HELICOPTER UTILITY: UH-60M	H32429	10	0	0
MEDEVAC HELICOPTER: HH 60M	M33458	21	0	0
BATTLE COMAND C2				
FREQ HOPING MLTIPLEX: TD-1456VRC	F99520	51	0	0
AN/TSC-183, AN/TSC-183A CSS VSAT:	J97857	10	0	0
RADIO SET: AN/VSQ-2D(V)2	P99724	28	0	0
MANEUVER COMBAT VEHICLE				
FIGHTING VEHICLE: FULL TRACKED INFANTRY (IFV) M2A3	F60564	9	0	0
TRUCK UTILITY ECV TOW/ITAS CARRIER WITH IAP ARMOR READY: M1167	T34840	5	0	0
COMBAT MOBILITY				
TRUCK UTILITY: ECV ARMAMENT CARRIER W/IAP ARMOR READY M1151A1	T34704	555	0	0
TRUCK UTILITY EXPANDED CAPACITY ENHANCED 4X4: M1165A1	T56383	29	0	0
TRUCK CARGO: M985A4	T59380	68	0	0
TRUCK UTILITY: EXPANDED CAPACITY 4X4 W/E HMMWV M1113	T61630	43	0	0

Projected Equipment Transfer/Withdrawal Quantities

Nomenclature	Equip No.	FY 2022 QTY	FY 2023 QTY	FY 2024 QTY
FIELD LOGISTICS				
AVENGER UNIT: DSMA1 MAINTENANCE SHOP SET	A09153	4	0	0
CMPUTER SET DIGITAL: AN/TYQ-151(V)1 ULLS-A(E)	C61191	528	0	0
DISTRIBUTION SYSTEM ELEC: 120/208V 3PH 40AMP	F55485	13	0	0
KITCHEN: COMPANY LEVEL FIELD FEEDING	K28601	29	0	0
SHOP EQUIPMENT: CONTACT MAINTENANCE ORD/ENG TRUCK MOUNTING	S25681	39	0	0
TRUCK LIFT: FORK VARIABLE REACH ROUGH TERRAIN	T73347	64	0	0
GENERAL ENGINEERING				
CONTROL REMOTE LANDMINE SYSTEM: M71	C96840	21	0	0
INSTRUMENT SET RECONNAISSANCE AND SURVEYING: AN/TKQ-5	D17191	7	0	0
ENGINEER MISSION MODULE-WATER DISTRIBUTO (EMM-WD): TYPE II	E05007	4	0	0
TRANSPORTER COMMON BRIDGE:	T91308	206	0	0
MEDICAL FIELD SYSTEMS				
DEFIBRILLATOR MONITOR RECORDER: 120/230V 50/60HZ AC OR DC	D86072	70	0	0
PUMP INTRAVENOUS INFUSION PIV:	P16161	63	0	0
SINK UNIT SURGICAL SCRUB AND UTENSIL HOSPITAL FIELD: 110V 60C AC	T60464	4	0	0
VENTILATOR VOLUME PTBL:	V99788	21	0	0
SOLDIER SYSTEMS				
ILLUMINATOR INTEGRATED: SMALL ARMS STORM MLRF	J68653	57	0	0
LASER TARGET LOCATOR MODULE, INFRA-RED SYSTEMS:	L05021	146	0	0
MAST: AB-1339A/G	M13833	107	0	0
MINI EYESAFE LASER INFRARED OBSERVATION SET (MELIOS): AN/PVS-6	M74849	1,238	0	0
TARGET LOCATOR MODU:	T27471	5	0	0
ARMAMENT SUBSYSTEM: REMOTELY OPER	A90594	40	0	0
CARBINE 5.56 MILLIMETER: M4A1	C06935	2,283	0	0
LASER: TARGET LOCATOR MODULE	L05003	25	0	0

ARNG
Projected Equipment Transfer/Withdrawal Quantities

Nomenclature	Equip No.	FY 2022 QTY	FY 2023 QTY	FY 2024 QTY
MORTAR: 120 MILLIMETER TOWED	M68326	8	0	0
TRAILERS				
SEMITRAILER FLATBED: BREAKBULK/CONTAINER TRANSPORTER CMRCIAL 34T	S70159	168	0	0
TRAILER TANK: WATER 400 GALLON 1-1/2 TON 2 WHEEL W/E	W98825	7	0	0

Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is able to be deployed in wartime. This data meets the Title 10 requirement to identify equipment that is not the most desired item of equipment.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
AIRCRAFT						
HELICOPTER UTILITY: UH-60L	H32361	HELICOPTER UTILITY: UH-60A	K32293	6	X	
UNIVERSAL GROUND CONTROL STATION 788 (UGCS-788)	U05011	GROUND CONTRL STATION (GCS): (TUAV-SHADOW)	G39497	1	X	
UNMANNED AERIAL VEHICLE (UAV): (TUAV-SHADOW)	U05001	UNMANNED AIRCRAFT RQ-7BV2	U05012	4	X	
AVIATION						
BLACK HAWK EXTERNAL AUXILIARY FUEL SYSTEM:	Z05614	UH-60 EXTERNAL STORES SUBSYSTEM (ESSS):	E21985	140	X	
BATTLE COMMAND C2						
CMPUTER SET DIGITAL: AN/TYQ-151(V)1 ULLS-A(E)	C61191	CMPTR SET DIGITAL: AN/TYQ-151(V)3	C61068	216	X	
COM ULLS-AE W/PTR:	C40745	CMPTR SET DIGITAL: AN/TYQ-151(V)3	C61068	59	X	
COMPUTER SET, DIGITAL (JBC-P): AN/UYK-128B(V)3	C05036	COMPUTER SET DIGITAL: AN/UYK-128	C18378	712	X	
COMPUTER SET: DIGITAL (JBC-P LOG) AN/UYQ-90B(V)4	C05055	NAVIGATION SET: SATELLITE SIGNALS AN/PSN-13	N96248	1105	X	
COMPUTER SET: DIGITAL OL-605/TYQ	C18344	COMPUTER SET: DIGITAL OL-608/TYQ	C27823	1	X	
COMPUTER SYSTEM: DIGITAL AN/UYQ-90(V)2	C18278	NAVIGATION SET: SATELLITE SIGNALS AN/PSN-13	N96248	5619	X	
GEN SET: DED SKID MTD 15KW 50/60HZ	G12170	GEN ST DED15KWW 50/60HZ: SKID-MTD	G49966	8	X	
GEN SET: DED SKID MTD 30KW 50/60HZ	G74575	GEN ST DE 30KWW 50/60HZ: SKID-MTD	G75200	4	X	
LTT TRAILER-MTD: PP-3101/5 KW/50/60 HZ/M200A1	L27070	POWER PLANT ELEC DED TM: 5KW 60HZAN/MJQ-36	P28151	2	X	
NAVIGATION SET: SATELLITE SIGNALS AN/GSN-13	N96180	NAVIGATION SET: SATELLITE SIGNALS AN/PSN-13	N96248	4	X	
POWER SUPPLY: PP-6224/U	P40750	POWER SUPPLY: PP-2953/U	P38588	456	X	
SHELTER: NONEXPANDABLE S250	S01427	SHELTER: NONEXPD LTWR MP RIGID -WALL S788 102LX84WX67H MTD HMMWV	S01563	23	X	
TRAILER-MTD: PU-2102/30 KW/50/60 HZ/M200A1	T39954	GENERATOR SET DIESEL ENGINE TM: PU-803	G35851	24	X	
BATTLESPACE AWARENESS						
CENTRAL: COMMUNICATIONS AN/TSQ-226(V)1	C43263	CENTRAL: COMMUNICATIONS AN/TSQ-226(V)3	C43399	4	X	
DETECTING SYSTEM COUNTRMEASURES: AN/MLQ-40(V)4	D04182	DETECTING SYSTEM: COUNTERMEASURES AN/MLQ-40(V)1	D02704	11	X	
DIG TOPOGRAPH SYS: AN/TYQ-67(V)	D10281	WORKSTATION, GEOSPATIAL INTELLIGENCE: AN/TYQ-71(V)	D11498	2	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
BATTLE COMMAND TRANSPORT NETWORKS						
RADIO TERMINAL: LINE OF SIGHT MULTI CHANNEL AN/TRC-190F(V)3	R90587	CENTRAL COMMUNICATIONS: AN/MSC-82	C05022	27	X	
RADIO TERMINAL: LINE OF SIGHT MULTI CHANNEL AN/TRC-190F(V)3	R90587	CENTRAL: COMMUNICATIONS AN/MSC-85(V)1	C05094	2	X	
RADIO TERMINAL: LINE OF SIGHT MULTI CHANNEL AN/TRC-190F(V)3	R90587	RADIO TERMINAL: LINE OF SIGHT MULTI-CHANNEL AN/TRC-238(V)2	R05031	24	X	
RADIO TERMINAL: LINE OF SIGHT MULTI CHANNEL AN/TRC-190F(V)3	R90587	RADIO TERMINAL: LINE OF SIGHT MULTI-CHANNEL AN/TRC-238(V)1	R05029	6	X	
TRAILER-MTD: PP-3102/10 KW/50/60HZ/M200A1	T39849	POWER PLANT: DIESEL TRL/MTD 10KW60HZ AN/NJQ-37	P42262	25	X	
COM ST GEN INFO DAT: AN/GYK-49(V)4	C05017	SECURITY DATA SYSTEM: AN/GYK-72(V)1 (KMI MGC)	S05038	5	X	
COMPUTER SYSTEM: DIGITAL AN/PSQ-17	C18380	COMPUTER DIGITAL MISSION PLANNER: AN/PYQ-19	C05003	29	X	
RADIO SET: AN/PRC-104A	R55200	RADIO SET: AN/PRC-150A(C)	R62247	192	X	
RADIO SET: AN/PSC-5	R57606	MBMMR: AN/PSC-5D	M27420	299	X	
RADIO SET: AN/PSC-5	R57606	RADIO SET: AN/PRC-117F(V)2(C)	R87207	1008	X	
RADIO SET: AN/VRC-104(V)6 150 WATT W/ PRC-150 HF RADIO	R87139	RADIO SET: AN/PRC-104A	R55200	46	X	
RADIO SET: AN/VRC-104(V)6 150 WATT W/ PRC-150 HF RADIO	R87139	RADIO SET: AN/VRC-104(V)5	R44706	113	X	
RADIO SET: AN/VRC-91F(C)	R68146	RADIO SET: AN/VRC-89F(C)	R44999	237	X	
REMOT CONTROL UNIT KY 100: KY 100 AIRTERM	R71740	REMOTE CONTROL UNIT: Z-AHP/TEC	R71604	191	X	
SPEECH SECURITY EQUIPMENT: TSEC/KY-57	S01373	KY-99: MINTERM	K47623	192	X	
TELECONFERENCE SYSTEM AN/TYQ-122B(V)2	Z05448	SWITCHING GROUP: DIGITAL DATA OA-9511/TYQ	S24749	66	X	
COMBAT MOBILITY						
BRIDGE, HEAVY ASSAULT SCISSORING	B31098	BRIDGE ARMOR VEH LAUNCH SCISSOR TY: CL 60 ALUM 60 FT LG OF SPAN	C20414	18	X	
DETECTING SET MINE: PTBL METALLIC (AN/PSS-11)	G02341	DETECTING SET: MINE AN/PSS-14C	D05016	63	X	
DETECTING SET: MINE AN/PSS-14	D03932	DETECTING SET MINE: PTBL METALLIC (AN/PSS-11)	G02341	3019	X	
DISPENSING SET MUNITION NETWORK COMMAND: SPIDER M7E1	D05021	MUNITION: NETWORK COMMAND (SPIDER)	M92387	17	X	
LOADER SCOOP TYPE: DSL 2-1/2CU YD HINGE FRME W/MULTI PURP BUCKET	L76556	LOADER SCOOP TYPE: 2.5 CUBIC YARD	L76897	11	X	
TRANSPORTER COMMON BRIDGE:	T91308	TRANSPORTER, COMMON BRIDGE (CBT) M1977A4	T05067	25	X	
FIELD LOGISTICS						

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
ASSAULT KTCHN: (AK)	A94943	KITCHEN: COMPANY LEVEL FIELD FEEDING	K28601	261	X	
ELECTRONIC SHOP SHELTER MOUNTED AVIONICS: AN/ASM-146 LESS POWER	H01907	ELECTRONIC SHOP SEMITRAILER MOUNTED: AN/ASM-189 LESS POWER	H01855	86	X	
HYDRAULIC SYS TEST AND REPAIR UNIT (MX3):	H05002	TOOL OUTFIT HYDRAULIC SYSTEM: TEST AND REPAIR 3/4 TON TLR MTD	T30377	14	X	
KITCHEN FIELD TRAILER MOUNTED: MTD ON M103A3 TRAILER	L28351	CONTAINERIZED KITCHEN: CK	C27633	73	X	
MACHINIST'S MEASURING TOOL SET (MMTS)	M20190	TOOL KIT WELDERS:	W58075	79	X	
MULTI-TEMPERATURE REFRIGERATE CONTAINER SYSTEM: MTRCS	M30688	CONTAINER ASSEMBLY REFRIGERATED: 8X8X20 W/9000 BTU REF UNIT	C84541	2	X	
SHOP EQUIP INSTR AND FIRE CONT SYS REPAIR: FM BASIC LESS POWER	T31784	ARMAMENT REPAIR SHOP SET (ARSS):	A05031	1	X	
SHOP EQUIPMENT MACHINE SHOP: FM BASIC LESS POWER	T15644	SHOP EQUIPMENT MACHINE SHOP: FM HEAVY LESS POWER	T15640	18	X	
SHOP EQUIPMENT: AUTOMOTIVE VEHICLE	S25885	SHOP EQUIPMENT AUTOMOTIVE MAINT AND REPAIR: FM BASIC LESS POWER	T24660	3	X	
SHOP EQUIPMENT: AUTOMOTIVE VEHICLE	S25885	TOOL SET VEHICLE FULL TRACKED: ORG MAINT SUPPL NO 2 LESS POWER	W65747	1	X	
SHOP SET SMALL ARMS: FIELD MAINTENANCE BASIC LESS POWER	W51499	ARMAMENT REPAIR SHOP SET (ARSS):	A05031	6	X	
TEST SET RADIO: AN/PRM 36	T05038	RADIO TEST SET: AN/PRM-34()	R93169	142	X	
TEST SET: RADAR TS-4530A/UPM	T99847	TEST SET TRANSPONDER: AN/APM-424(V)2	T49460	3	X	
TEST STATION ELECTRICAL ELECTRONIC EQUIPMENT CONTAINERIZED:	Z01554	TEST FACILITY BASE SHOP (BSTF/S): SINGLE PORT AN/TSM-191(V)3	T92961	1	X	
TRAILER TANK: WATER 400 GALLON 1-1/2 TON 2 WHEEL W/E	W98825	TRAILER TANK WATER (CAMEL): 800 GAL 5 TON W/E	T05047	21	X	
FORCE PROTECTION						
JOINT CHMCL AGENT: DETECTOR	J00697	ALARM: CHEMICAL AGENT AUTOMATIC M22	A33020	6	X	
GENERAL ENGINEERING						
ENGINEER MISSION MODULE-WATER DISTRIBUTO (EMM-WD): TYPE II	E05007	DISTRIBUTOR WATER TANK TYPE: 6000 GL SEMITRAILER MTD (CCE)	D28318	11	X	
EXCAVATOR: HYDRAULIC (HYEX) TYPE I MULTIPURPOSE CRAWLER MOUNT	E27792	EXCAVATOR: HYDRAULIC (HYEX) TYPE III MULTIPURPOSE CRAWLER MOUNT	E27860	5	X	
EXCAVATOR: HYDRAULIC (HYEX) TYPE I MULTIPURPOSE CRAWLER MOUNT	E27792	TRACTOR FULL TRCKD LOW SPD: DSL MED DBP W/BULDOZ W/SCARIF WINCH	W76816	27	X	
SCRAPER EARTHMOVING: 14-18 CU YD	S05029	SCRAPER EARTH MOVING SELF-PROPELLED: 14-18 CU YD (CCE)	S56246	53	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
TOOL KIT CARPENTERS: ENGINEER PLATOON W/CHEST	W34511	TYPE II CARPENTERS SUPPLEMENTAL TOOL KIT (CSTK)	T05084	78	X	
TOOL KIT CARPENTERS: ENGINEER SQUAD W/CHEST	W34648	TYPE I CARPENTERS TOOL KIT SQUAD (CTKS)	T05085	378	X	
TOOL KIT ELECTRICIANS: SET NO 1	W36977	TYPE IV ELECTRICIANS TOOL KIT (ETK)	T05082	25	X	
TOOL KIT MASON AND CONCRETE FINISHERS: BRICK STONE AND CONCRETE	W44923	TYPE V MASON & CONCRETE TOOL KIT (MCTK)	T05081	125	X	
TOOL KIT PIPEFITTERS: 1/8 TO 2 IN PIPE	W48622	TYPE VI PLUMBERS & PIPEFITTERS TOOL KIT (PPTK)	T05080	8	X	
TOOL KIT PIPEFITTERS: 2-1/2 TO 4 IN PIPE	W48759	TYPE VI PLUMBERS & PIPEFITTERS TOOL KIT (PPTK)	T05080	14	X	
TOOL KIT: ENG CONSTRUCTION CARPENTER SHOP (CTS)	T16988	TYPE III CARPENTERS TOOL KIT (CTK)	T05083	33	X	
TOOL OUTFIT PIONEER: PTBL HYDRAULIC/ELECTRIC TOOLS OUTFIT (HETO)	W58486	HYDRAULIC ELECTRIC PNEUMATIC PETROLEUM OPERATED EQUIP: (HEPPOE)	H05004	6	X	
TRACTOR FULL TRACKED HIGH SPEED: ARMORED COMBAT EARTHMOVER (ACE)	W76473	TRACTOR FULL TRCKD LOW SPD: DSL MED DBP W/BULDOZ W/SCARIF RIPPER	W83529	6	X	
TRACTOR FULL TRACKED HIGH SPEED: DEPLOYABLE LT ENGINEER (DEUCE)	T76541	TRACTOR FULL TRCKD LOW SPD: DSL MED DBP W/BULDOZ W/SCARIF WINCH	W76816	8	X	
MANEUVER COMBAT VEHICLE						
CARRIER ARMORED COMMAND POST: FULL TRACKED	C11158	CARRIER COMMAND POST: LIGHT TRACKED	D11538	44	X	
RECONNAISSANCE VEH: (RV)	R62673	INFANTRY CARRIER: VEHICLE (ICV)	J22626	10	X	
TANK COMBAT FULL TRACKED: 120MM GUN M1A2	T13305	TANK COMBAT FULL TRACKED: 120 MILLIMETER GUN	T13168	13	X	
MANEUVER SYSTEMS						
LAUNCHER GRENADE SMOKE: SCREENING RP M250	L44680	LAUNCHER GRENADE ARMAMENT SUBSYSTEM: SCREENING RED PHOSPHO M239	L44612	18	X	
MORTAR: 120 MILLIMETER TOWED	M68326	MORTAR 120 MILLIMETERS:	M68405	8	X	
MEDICAL FIELD SYSTEMS						
DEFIBRILLATOR MONITOR RECORDER: 120/230V 50/60HZ AC OR DC	D86072	AUTOMATIC EXTERNAL DEFIBRILLATOR (AED) :	A05034	59	X	
MEDICAL EQUIPMENT SET AIR AMBULANCE HELICOPTER LIGHT UTILITY	M05043	MEDICAL EQUIPMENT SET AIR AMBULANCE:	M29213	48	X	
ULTRA SOUND DIAGNOSTIC SYSTEM: HAND-CARRIED	U26813	ULTRASOUND UNIT DIAGNOSTIC: VETERINARY (USUDV)	U05009	2	X	
X-RAY APPARATUS: LOW CAPACITY PORT	X90968	X-RAY APPARATUS PORTABLE DIGITAL RADIOGRAPHY:	X05003	1	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
SOLDIER SYSTEMS						
BAYONET-KNIFE: W/SCABBARD FOR M16A1 RIFLE	B49272	BAYONET MULTIPURPOSE SYSTEM: XM9	B49004	25557	X	
M25A1: STABILIZED BINOCULAR	M05036	BINOCULAR: M25	B67907	489	X	
SIGHT: NIGHT VISION SNIPERSCOPE AN/PVS-10	S90433	SIGHT NIGHT VISION (SNS): AN/PVS-30	S60342	11	X	
TARGET LOCATOR MODU:	T27471	MINI EYESAFE LASER INFRARED OBSERVATION SET (MELIOS): AN/PVS-6	M74849	673	X	
SOLDIER WEAPONS						
LAUNCHER GRENADE: M320A1	L69080	LAUNCHER GRENADE: M203A2	L69012	538	X	
MACHINE GUN CALIBER .50: HB FLEXIBLE (GROUND AND VEHICLE) W/E	L91975	MACHINE GUN CALIBER .50: HEAVY FIXED TURRET TYPE	L91701	2	X	
MACHINE GUN CALIBER .50: HB FLEXIBLE (GROUND AND VEHICLE) W/E	L91975	MACHINE GUN GRENADE 40MM: MK19 MOD III	M92362	1	X	
MACHINE GUN CALIBER .50: HB FLEXIBLE (GROUND AND VEHICLE) W/E	L91975	MK47 MOD 0: WPN SYSTEM	M86811	1	X	
MACHINE GUN: CALIBER 50	M39331	MACHINE GUN CALIBER .50: HB FLEXIBLE (GROUND AND VEHICLE) W/E	L91975	757	X	
STRIKE						
A3 BFIST: W/FS3	A70576	ARMORED: RECONNAISSA	A40164	39	X	
SUPPORT SYSTEMS						
CONTAINER HANDLING:	C27294	CONTAINER HANDLING: CONTAINER HANDLING UNIT (CHU)	C84862	117	X	
CONTAINER HANDLING:	C27294	CONTAINER HANDLING: HEAVY EXP MOBIL TACT TRK (HEMTT)	C84930	24	X	
OUTBOARD MOTOR GASOLINE: 25-40 BHP	N34334	FOBAM OUTBOARD MOTOR	F05019	42	X	
TRAILERS						
SEMITRAILER TANK: 5000 GAL BULK HAUL SELF-LOAD/UNLOAD W/E	S10059	SEMITRAILER TANK: 5000 GAL FUEL DISPENSING AUTOMOTIVE W/E	S73372	47	X	
TRAILER CARGO: 1-1/2 TON 2 WHEEL W/E	W95811	TRAILER FLAT BED: M1082 TRLR CARGO LMTV W/DROPSIDES	T96564	34	X	
TRUCKS						
TRACTOR LIN HAUL: M915A5	T88858	TRUCK TRACTOR: LINE HAUL C/S 50000 GVWR 6X4 M915	T61103	873	X	
TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10	T40999	TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10 W/MHE W/E	T41067	60	X	
TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10	T40999	TRUCK: 1075A0 WITH ECHU	T05064	29	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
TRUCK CARGO: HEAVY PLS TRANSPORTER 15-16.5 TON 10X10	T40999	TRUCK: M1075A1 WITH ECHU	T05063	137	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOB W/LHS	T96496	TRUCK: M1120A2 WITH ECHU	T05062	6	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOB W/LHS	T96496	TRUCK: M1120A4 WITH ECHU	T05061	91	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/MED CRANE	T39586	TRUCK CARGO: M985A4	T59380	9	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/W W/LT CRANE	T39518	TRUCK CARGO: M977A4	T59532	3	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/W W/LT CRANE	T39518	TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/W MED CRANE	T39654	15	X	
TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/W W/LT CRANE	T39518	TRUCK: M1120A4 WITH ECHU	T05061	30	X	
TRUCK DUMP: 20 TON DSL DRVN 12 CU YD CAP (CCE)	X44403	TRUCK DUMP: 5 TON 6X6 W/E	X43708	2	X	
TRUCK DUMP: MTV W/E	T64911	TRUCK DUMP: 10 TON WO/WINCH	T65342	5	X	
TRUCK PALLETIZED (LHS): M1120A4	T55054	TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOB W/LHS	T96496	302	X	
TRUCK PALLETIZED (LHS): M1120A4	T55054	TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/LT CRANE	T59278	44	X	
TRUCK PALLETIZED (LHS): M1120A4	T55054	TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOBILITY W/W W/LT CRANE	T39518	20	X	
TRUCK TANK: WO/WINCH	T58318	TRUCK TANK: FUEL SERVICING 2500 GALLON 8X8 HEAVY EXP MOB W/WINCH	T58161	23	X	
TRUCK TRACTOR: MTV W/E W/W	T61307	TRUCK TRACTOR: M1088A1P2 W/WINCH	T61375	19	X	
TRUCK TRACTOR: MTV W/E W/W	T61307	TRUCK TRACTOR: MTV W/E	T61239	84	X	
TRUCK TRACTOR: WO/WINCH	T88983	TRUCK TRACTOR: MTV W/E	T61239	7	X	
TRUCK VAN: M1079A1P2 WO/WINCH	T62359	TRUCK VAN: LMTV W/E	T93484	12	X	
TRUCK WRECKER:	T94671	TRUCK WRECKER: MTV W/E W/W	T94709	8	X	

ARNG
Significant Major Item Shortages

Table 8

Note: *This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.*

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Joint Battle Command – Platform (JBC-P) and Mounted Family of Computer System (MFoCS) (hardware)	46,150	32,882	Multiple LINs Average Procurement Unit Cost (APUC) $24,796K	* No Current Unfunded Requirement (UFR)	The JBC-P and MFoCS consist of multiple LINs (CO5O36, C05037, C05054, C05055) providing Mission Command On-the-Move capability and situational awareness across all formations. The ARNG requires modernization to JBC-P in order to fill critical BFT shortages amongst the force and to further baseline our formations with modernized software/hardware/network that will reduce interoperability issues and cyber vulnerabilities. JBC-P serves as the foundation for the Mounted Computing Environment (MCE), part of the Common Operating Environment (COE) initiative. The Army force structure growth (approved in the Army Structure Message (ARSTRUC) FY 2020–FY 2024) and the Army Preposition Stock (APS) Configure for Combat (CfC) decision created a 10 percent increase in the total Army requirement, delaying ARNG full modernization until FY 2025. * HQDA POM23 Planning Task $254M Unfunded Requirement (UFR) has been fully funded during FY23-25 in order to resource HQDA AAO/BOI increase (POM22-26) from 103,158 to 109,289 (four JBC-P LINs).
2	Next Generation Automatic Test set (NGATS)	29	29	$3M	$87M	NGATS provides diagnostic maintenance support for all variants of the Abrams tank, Bradley fighting vehicle, Paladin artillery system, and Avenger Air Defense system. The ARNG has 5 ABCTs split across 13 states. Although the ARNG requirement was validated, the Army Acquisition Objective (AAO) is for the original requirement for two systems per ABCT. ARNG plans to use NGREA funding to procure non-tactical NGATS capability for its TDA maintenance support facilities. Fielding for the NGATS to ARNG begins in FY 2021.
3	Nuclear, Biological, Chemical Reconnaissance Vehicles (NBCRVs)	81	12	$4.5M	$54.M	The Army is no longer procuring NBCRVs, leaving an Army wide shortage and ARNG with a shortfall of 12 systems. However, ARNG NBCRVs on hand will receive a sensor suite upgrade. This item is both a Pacing Item (reports against readiness) and a Critical Dual Use (CDU) equipment. The ARNG will cross-level the NBCRV's as need to fulfill mission requirements.
4	Transporter Common Bridge M1977A4	636	196	$461K	$90.3M	Additional funding for the Army's modernization priorities gravely impacted the ARNG Engineering and Mobility portfolio. Specifically, 31% of the ARNG Multi-Role Bridge Company's will not go through the recapitalization program upgrades from M1977A0/A2 Common Bridge Transport (CBT) to the M1977A4 CBT. Therefore, four ARNG Multi-Role Bridge Companies will lack the same level of survivability and modernization as the Active Army.
5	M984A4 Wrecker	725	103	$886K	$91.3M	Funding for the M984A4 ends after FY20, severely hindering recovery capabilities of the HEMTT vehicles or light tactical wheeled vehicles across the ARNG. The ARNG recovery capability with the M984A4 Wrecker is projected to achieve 50% of its modernization requirement by the end of FY20. This 11-ton wrecker is capable of recovering other HEMTT vehicles as well as medium and light tactical wheeled vehicles. (Authorization: 1093 FMSWEB On Hand: 546 DST/554 AREM)
6	All Terrain Crane, Type II	126	43	$1.1M	$47.3M	The All Terrain Crane, Type II modernizes the 25Ton Crane providing the Horizontal, Clearance, Vertical Construction, Engineer Support Company, Combat Engineer Company - Infantry (CEC-I) with capabilities needed to support the Maneuver BCT. The ARNG is projected to only meet 66% of the modernization requirement resulting in all 43 ARNG Engineer Companies un-modernized in support of Domestic Operations.
7	Hydraulic Excavator (HYEX)	218	52	$350K	$15.6M	Critical to the mission capability sets required of Horizontal and Vertical Construction Companys and Multirole Bridge Company, the HYEX provides unique support to maneuver forces and key to bridging operations. . Due to additional decrement in funding, only 80% of the units across the Total Army will receive this capability. The ARNG continues to use NGREA funding to mitigate this modernization shortfall.

ARNG
Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
8	Detecting Set: Mine AN/PSS-14	3,638	3,638	$27.5K	$100.1M	The Detecting Set: Mine AN/PSS-14 program is severly underfunded. In the Future Year Program Defense budget ARNG is funded at 56%. Without this capability ARNG Units; Engineer, Ordance, Field Artillary, Infantry, Ranger, Armor and Special Forces, will not have the ability to clear a path, trail or road of mines, explosive hazards, and triggering mechanisms. The AN/PSS-14 was nominated for FY20 NGREA however those funds were reprogramed back to the Office of Secretary Defense (OSD) to fund other priorities.

III. Army Reserve Overview

A. Current Status of the Army Reserve

1. General Operational Overview

Top Army Reserve Focus Areas

- **Resourcing:** Optimize processes and prioritization to deliver modern enabler capabilities to support Multi-Domain Operations, including risk-informed divestiture of legacy equipment
- **Readiness:** Invest in responsive capabilities to enhance equipping posture for day-to-day competition, large-scale combat operations, Homeland Defense, and Defense Support to Civil Authorities
- **Modernizing:** Advocate for the development of future enabler capabilities to accelerate interoperability and holistically identify/ forecast resource gaps

The Army Reserve (USAR) is a community-based, global operational force with a presence in all 54 states and territories and the District of Columbia and 30 countries. It spans the globe with over 200,000 Soldiers and Civilian employees and more than 2,000 units in 20 different time zones. The USAR comprises nearly 65 percent of the Army's sustainment capabilities; 20 percent of its organized units; nearly half its total maneuver support; and a quarter of its mobilization base expansion capacity. With the mantra of "READY NOW! SHAPING TOMORROW...," the priorities of the Chief of Army Reserve and Commanding General, U.S. Army Reserve Command are: People, Readiness, Modernization, Partnerships, and Reform. The USAR is focused on manning, equipping, and training formations to support Combatant Commanders by deploying critical enabling capabilities within days or weeks and developing the future capabilities required to support MDO Capable Force (2028) and MDO Ready Force (2035). Put simply, the USAR supports U.S. national security interests by providing key and essential capabilities that the Total Army and the Joint Force need to compete and win.

a. The Army Reserve as an Operational Force

"Modernization is necessary to drive our processes and systems to support operations in the multi-domain environment. We have to be able to mobilize quickly and employ the necessary capabilities to win the future fight."

– LTG Jody J. Daniels, Chief of Army Reserve & Commanding General, U.S. Army Reserve

The USAR provides quick access to the mission-capable forces and capabilities the Army needs to build expeditionary combat power and sustain a campaign-capable force. Through their storied history of service in wars, contingency operations, and domestic emergencies, the Soldiers of the USAR has never failed to answer the nation's call. Evolving from a small corps of medical professionals to what is today a global operational reserve force, the USAR has become a relevant and skilled operational reserve. As the USAR looks to the challenges of the future, modernization and lifecycle sustainment of critical equipment are imperative to fully support MDO on multiple fronts. The USAR must remain compatible with the Total Army and fully capable of providing enabling functions in MDO. The Army equipment modernization strategy is focused on developing next generation combat vehicles, aerial platforms, network

communications, precision fires, and Soldier systems. However, enabler capabilities and capacities will also need to evolve for the Army to achieve transformation goals required to fight and win on a complex battlefield against near-peer competitors. The USAR strategy is to concentrate equipping priorities on units identified as early entry and on theater opening forces most critical to setting the conditions for and sustaining combat operations. Other USAR units will remain sized, trained, and postured to provide operational and strategic depth for the full scope of contingency missions. As part of the Joint Force, rapidly generating and deploying capable units requires the most modern equipment available to close interoperability gaps and ensure the same level of survivability, lethality, mobility, and network connectivity. Predictable and balanced resourcing for equipment modernization is required to meet these objectives, particularly as the Army seeks to harness rapid technological advancement.

b. Homeland Defense and Defense Support of Civil Authorities

The USAR is uniquely postured with Soldiers and equipment in over 1,100 communities to employ capabilities critical to HD and DSCA, including search and rescue, aviation, engineering, transportation, medical, water and fuel distribution, and communications support. The USAR provides a ready and deliberate response to DSCA demands. These responses are conducted under differing authorities and requested from different sources.

Over the past year, the USAR provided personnel and equipment to support numerous natural disaster response and search and rescue missions. Highlights include:

- Mobilized 3,890 service members, including Emergency Preparedness Liaison Officers (EPLOs), in response to COVID-19
- Activated 299 service members to provide support in Puerto Rico after several natural disasters
- Participated in more than a half dozen certification training events and seminars supporting mobilizations and chemical, biological, radiological, and nuclear and DSCA actions
- Provided a CH-47 with five crewmembers to rescue three stranded hikers on Mount Rainer
- Provided 183 USAR EPLOs in support of Hurricane Dorian, the UN General Assembly, and the western wildfires.

Readiness and availability of USAR CDU equipment is essential to respond to HD and DSCA events. CDU equipment on-hand posture is 94 percent including substitutes and 83 percent without substitutes, with a shortfall exceeding $1 billion. The USAR cannot perform some of its wartime missions with the current CDU posture, but can support HD and DSCA missions. The Army-identified liquid logistics capability gaps during LSCO are partially caused by the shortage of fuel and water systems in the USAR. The lack of these systems reduces the capability of petroleum and water units, but these units can still perform missions at a reduced capacity. Table 2-15 highlights the top USAR CDU equipment shortage values by capability.

Table 2-15. Army Reserve Top CDU Shortages

Capability	Equipment Type	Shortage Value
Engineering	Semitrailer Low Bed: (40 Ton)	$81M
Engineering	Heavy Dump Truck	$69M
Logistics	3K Gallon Reverse Osmosis Water Purification Unit	$56M
Logistics	Load Handling System 2,000 Gal Tank (HIPPO)	$34M
Transportation	M872A4 Semitrailer Flatbed: Transporter (34 Ton)	$13M

2. Status of Equipment

> *"Modernization is not just about equipment—the Army does not man equipment, the Army equips Soldiers."*
>
> ***– Army Modernization Strategy***

Over the past 12 months, the USAR's equipment shortage has increased from $4.3 billion to over $4.6 billion and is forecasted to grow to $4.99 billion in FY 2023. Although the USAR continues to advocate for consistent and predictable equipping, it is unable to fill all critical requirements. Slow production rates, reset issues, delays in payback plans, component reallocation of procured equipment, funding limitations, requirements approved in advance of resourcing, and deliberate Army decisions to procure less than the AAO, have resulted in shortages. As a result, units do not achieve required equipment readiness levels until at/near deployment. As the Army overhauls its acquisition process to ensure it keeps pace with near-peer competitors, the USAR will likely see significant negative impacts to readiness levels as funding shortfalls result in equipment shortages.

a. Equipment On-hand

In aggregate, the USAR's EOH without substitute items is 83 percent. When substitute items are included, the EOH climbs to 95 percent. The 12 percent substituted, in-lieu equipment creates two issues: 1) Substitutes can mask interoperability issues creating a false picture of readiness. 2) The equipment tends to be of a legacy and outdated variety, requiring comparatively more resources to sustain and crowding out other investments. The USAR posture illustrates the inventory-based management approach of filling shortages by redistributing against legacy requirements, which places emphasis on aggregated quantities over documenting new requirements in advance to identify future capability gaps. The data is also indicative of the current resource prioritization model that slows the modernization rate for enabler systems by means of new procurement, creating mixed fleets that are more difficult to maintain and employ. In the near-term, developing future enabler systems will remain a low priority, creating modernization and readiness challenges for key USAR capabilities.

b. Average Age of Major Items of Equipment

The average age of USAR Top Legacy Equipment is provided in Table 2-16. The average age of the majority of USAR top legacy equipment exceeds the EUL. In some instances, the USAR's equipment dates back to the Cold War. As identified in previous years' NGRER reports,

equipment age has a direct correlation to higher failure rates, increases operational and maintenance costs, impacts unit readiness, and could impact mission success or failure. Rather than receiving fully modern ("most modern") equipment via direct procurement, the USAR received most equipment from cascading actions, and the equipment transferred was often already at or near the end of its planned service life. Programmed replacements and rebuilding efforts are not able to keep up with the needs of the USAR's critical mission requirements.

Resourcing recapitalization and rebuild programs remain essential for incrementally replacing legacy systems and decreasing the average age of USAR equipment. The USAR continues to divest aging and obsolete equipment to reduce the average age and sustainment cost. Although the Army has improved the compatibility and modernization of USAR equipment, some units will continue to use legacy equipment. Balancing divesting legacy equipment to save resources with maintaining at least some level of on-hand equipment will continue to be a challenge.

Table 2-16. Army Reserve Top Legacy Equipment

Nomenclature	Line Item Number	Average Age (years)	EUL (years)
Armored Vehicle Launched Bridge	L43664	41	25–30
M113A3 Armored Personnel Carrier	C18234	35	25–30
Semitrailer Flatbed 34-Ton	S70159	31	17–25
Trailer Tank Bulk Petroleum 7.5K	S73119	28	17–25
Heavy Dump Truck 20-Ton	X44403	26	20–25

c. Maintenance

A consistent yearly decrease in depot maintenance spending prevents aging fleets, including large amounts of CDU equipment, from being rebuilt. The USAR's depot maintenance budget is less than 20 percent of what it was just eight years ago. This reduction in funding is highly disruptive to the USAR fleet modernization effort. As a result, readiness rates are suffering and safety concerns have increased. Emphasizing depot maintenance ensures equipment is available and ready for all missions, especially as near-peer/great power competitors continue to modernize their forces. The USAR must be adequately funded to maintain a ready force to meet today's challenges while implementing a transformational modernization effort to ensure the Army is prepared for future threats. As a mitigation measure to accommodate anticipated budgetary shortfalls in light of the COVID-19 pandemic, the USAR will prioritize maintaining equipment for units designated to support the highest priority missions, essentially mothballing lower priority stock and leaving certain units with deliberate shortages.

The Army's and the USAR's Organic Industrial Base (OIB) manufacture, repair, upgrade, and modernize the Army's equipment, and are absolutely critical to both Strategic and Tactical Readiness. The OIB supports three primary end states: support current unit readiness across the force; maintain the ability to meet wartime surge requirements; and modernize and retool to sustain the next generation of Army equipment. The USAR's Depot Maintenance program is key to maintaining the readiness of the USAR fleet. As an integral part of the USAR's sustainment activities, the depot overhaul and rebuild programs sustain Reserve EOH and extend the service

life of its fleet. The USAR's sustainment activities help to decrease operational tempo spending. The current USAR Depot Maintenance Program funding level is $43.1 million. This is 65 percent of the USAR's critical requirement of $66.7 million in FY 2021. Planned reductions in the Depot Maintenance program in FY 2021 and across the FY 2021–FY 2025 budget will significantly affect the program.

d. Compatibility of Current Equipment with the Active Component (AC)

Over the past several years, the Army has greatly improved the interoperability and modernization of USAR equipment. However, a large percentage of units will continue to have legacy equipment. While the USAR has explored initiatives to mitigate these interoperability differences for deploying units through internal cross-leveling during pre-mobilization preparations, redistributing equipment is not an affordable or cost-effective solution because it consistently consumes limited financial resources. For the USAR to remain a ready and operational force, it must be funded and equipped appropriately. A lack of adequate resources risks the USAR's ability to conduct effective, timely, sustained operations.

In the current threat environment, ground forces must fully integrate with the other Services to project power from land into all domains. Joint Force interoperability, especially from a Mission Command perspective, is the essential bedrock to enabling MDO from a Mission Command perspective and is crucial to fully integrating USAR capabilities within the Joint Logistics Enterprise. It drives a need for concurrent fielding of modern equipment to Focused Readiness units that will deploy early to contested, non-permissive environments. The Army's goal is to improve readiness by achieving higher levels of interoperability across all formations while minimizing platform generational gaps.

e. Equipment Modernization

The Army realigned over $33 billion to fund the six material modernization priorities, new organizations, training upgrades, facilities improvements, and other associated modernization efforts. Although important, the costs of modernization while maintaining readiness will exponentially grow as systems enter low-rate initial production and then procurement. In an effort to find savings to ensure resources are available to develop and scale systems, the Army appears set to take a deliberate approach to transitioning equipment to sustainment based on business case analyses. This entails assessing its capability needs, acquisition programs, and existing systems to determine the best and most economical sustainment approach. This can lead to forgoing additional incremental upgrades to legacy systems. The Army could divest legacy programs to free up resources for modernization priorities. However, the timelines for divestiture and comparable modernization are on a separate glide path. Risk to USAR readiness increases as the gap between divestiture and modernization efforts continues to grow.

The Army's Modernization Strategy (AMS) builds on the efforts to reduce that risk by maintaining clearly identified modernization priorities and making difficult but necessary choices to ensure sufficient funding for priority materiel solutions.

3. Transparency

Transparency refers to the accountability, traceability, and reporting of requirements, regarding the programming, funding, contracting, production, and delivery of procurement items. The ongoing Army initiative to implement Item Unique Identification (IUID) technology as a supply chain management efficiency is expected to establish a link from developed requirements through the acquisition cycle to the delivery of equipment. This path enables systematic and auditable traceability of quantities to fiscal year appropriations for each item delivered. However, IUID will not deliver the capability to connect planning data captured in the P-1 submission to actual post-appropriation adjusted procurements—it does not validate funding in a manner consistent with Congressional intent.

Further work remains to capture and maintain accurate data across the planning, procurement, and equipment delivery phases of the budgetary process to accomplish end-to-end transparency. As such, the USAR will actively participate in efforts to improve business processes relative to adjusted component splits based on enacted funding. This includes improving data accuracy and reliability by fully transitioning to an automated system capable of capturing fielding plan adjustments and able to account for items programmed but not received.

4. Army Reserve Equipping Strategy

The USAR will ensure its Soldiers are ready to mobilize, deploy, fight, and win as an integrated part of the Army team anywhere in the world. This force will be equipped to support the Total Force in the joint, multi-domain operational environment at scale and speed. The USAR remains committed to the National Security Strategy pillar “Preserve Peace through Strength” and the National Defense Strategy line of effort "Build a More Lethal Force."

The AR’s equipping strategy will nest with the Army’s Regionally Aligned Readiness and Modernization Model and the Army Response Force concept. Accordingly, the USAR will prioritize the lead capability sets and formations over a period of years. In the near term, the USAR will equip early deploying formations required within the first zero to 90 days of an operation. This construct rationalizes equipping and modernization strategies to improve interoperability, sustainability, and lethality.

5. Equipping Successes

The USAR procured 5,300 JBC-P systems using a combination of base and National Guard and Reserve Equipment Appropriation (NGREA) funds. These systems are required for interoperability with supported units and the 5,300 systems will equip 324 high priority USAR units. JBC-P is the Army’s next-generation, friendly force tracking system, equipping Soldiers with a faster satellite network, secure data encryption, and advanced logistics.

The USAR utilized NGREA to modernize and up armor 200 M1075 Palletized Load Systems and 91 M1120 Armored Heavy Expanded Mobility Tactical Trucks. These modernization efforts provide increased capability and soldier protection for USAR Soldiers. These systems will enable more agile, flexible, and full-spectrum movement of loaded flat rack, container roll out

platform, International Standards Organization, and similar-sized equipment across the range of military operations throughout the battlefield.

B. Future Years Program (FY 2022–FY 2024)

1. FY 2024 Equipment Requirements

a. Base Budget

Sustaining the readiness of USAR capabilities requires consistent and predictable funding. The USAR must replace or recapitalize aging critical equipment to support MDO. Although inventories are expected to remain a mix of fully modernized equipment and acceptable legacy substitute items, the USAR must be adequately and consistently funded to be equipped with platforms and systems capable of global deployment and seamless integration in support of the full range of MDO. Difficult resource decisions have forced tough choices in accepting near-term risk in enabler systems to support development of higher priority programs. All formations will not modernize at the same rate because of the fiscal realities that drive resource prioritization. Since FY 2013, the USAR portion of the base budget has declined to less than three percent annually and is projected at two percent annually through FY 2024. The budgetary outlook reflects the shift to a resource prioritization strategy that will slow investments for enabler systems and increase reliance on redistributing assets and sustainment funding for legacy fleets.

2. Anticipated Transfers from AC to RC

Table 5 Projected Equipment Transfer/Withdrawal Quantities reflects planned equipment transfers from the AC to the RC from FY 2021–FY 2024.

3. Anticipated Withdrawals from Army Reserve Inventory

Currently, there are no pending transfers captured under DoDI 1225.06, *Equipping the Reserve Forces*.

4. Equipment Shortages and Modernization Shortfalls

USAR equipment shortages and modernization shortfalls are based on data derived from the Army's end strength force structure analysis. The following portfolio funding narratives highlight the AR's equipment shortages and resource shortfalls. Army business rules do not allow for advance documentation of validated equipping requirements before resourcing and fielding. The embedded data tables include both documented and validated Basis of Issue Plans requirements.

a. Aviation Portfolio

The USAR owns 6 percent of the total Army aviation structure, with a fleet consisting of both fixed-wing and rotary-wing aircraft. All USAR aircraft are considered a CDU capability suitable for both contingency operations and HD and DSCA missions.

Investments in New Procurement and Modernization: In FY 2019 and FY 2020, base budget funding ($54.1 million) accounted for 98 percent of total Aviation portfolio investments ($55.2 million), with NGREA funding ($1.1 million) accounting for critical modernization gaps.

Increased funding in FY 2021–FY 2024 ($50.8 million) reflects investments focused on ground support equipment (see Table 2-17).

Table 2-17. Aviation Procurement Funding

Funding Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Base Budget (P-1R)	$37M	$17.1M	$10.8M	$14.2M*	$14M*	$11.8M*
NGREA Investment	$1.1M*	$0M				

* Projected

The USAR is reliant on base funding for aircraft procurement and modernization programs. The USAR is not projected to receive platform funding until FY 2025 for Blackhawk L to V model conversions. The USAR's top critical documented shortages within the Aviation Portfolio are listed in Table 2-18.

Table 2-18. Aviation Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
HH-60M Black Hawk MEDEVAC*	60	29	31	29	$510M
C-12 Airplane*	32	30	2	30	$16M

* Critical Dual Use Equipment

Aviation Focal Points:

- The USAR MEDEVAC capability is not pure fleeted; 50 percent of Air Ambulance Companies (2 of 4) are equipped with the most-modern HH 60M Blackhawk models. The remainder are equipped with UH-60L and HH-60L models. UH-60V is an affordable means to provide a HH-60M-like digital avionics architecture to remaining analog platforms and provides interoperability and enhanced situational awareness.
- Common UH-60L models are scheduled for RECAP to UH-60V models in FY 2025. Three Kits will also be procured in FY 2025 and the aircraft will receive digital control systems, Upturned Exhaust System II, Pilot Vehicle Interface, and training with H-60M with 80 percent common LRUs.
- RECAP to UH-60V includes a $62 million allocation in FY 2025 and a $150 million allocation in FY 2026. The program is currently in the EMD Phase.
- There is no projected new procurement of H-60M platforms through FY 2024.

b. Mission Command Portfolio

The Mission Command portfolio consists of four capability areas that facilitate joint interoperability: transport, applications, enablers, and integration. The rate of technology advancement is outpacing the Army's ability to resource modern systems evenly across the total force. The USAR remains multiple generations behind in the most modern mission command systems, creating communication compatibility gaps with the Total Force. The USAR continues to work with HQDA to sufficiently prioritize units within fielding plans to achieve battlefield

commonality. It is difficult to discern the portfolio funding outlook because fiscal constraints drive continued requirement adjustments and reprogramming actions. However, total Army Reserve Mission Command equipment modernization budget shortfall estimates exceed $600 million based on documented and validated future requirements.

Investments in New Procurement and Modernization: In FY 2019 and FY 2020, base budget funding ($163 million) accounted for 78 percent of total Mission Command portfolio investments ($208.5M), with NGREA funding ($45.5M) critical modernization gaps (see Table 2-19).

Table 2-19. Mission Command Procurement Funding

Funding Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Base Budget (P-1R)	$68.5M	$94.5M	$82.7M	$100.9M*	$135.2M*	$159.8M*
NGREA Investment	$45.5M*	$0M				

* Projected

The AR's top critical documented shortages within the Mission Command Portfolio are listed in Table 2-20.

Table 2-20. Mission Command Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
JBC-P	15,263	3,790	11,473	11,043	$118M
Command System Tactical: TSIv2 Large	143	0	143	34	$53M
Command System Tactical: TSIv2 Small	438	0	438	57	$14M
Terrestrial Line of Sight (TRILOS (V)2)	180	0	180	66	$13M

* Critical Dual Use Equipment

Mission Command Focal Points:

- Resource prioritization for Mission Command systems favor maneuver units. Resourcing is not adequate to field to the total force or keep pace by replacing obsolete equipment.
- Approximately 41 percent of USAR units have never been fielded mission command systems and of those that have, 61 percent of mounted mission command systems are considered legacy systems with degraded capabilities. The Army investment strategy accelerated procurement to address legacy system network compatibility challenges and seeks complete modernization by FY 2025.
- Actual fielding quantities by component and year will vary depending on how units are prioritized on the HQDA G3 Unit Set Fielding list.

c. Transportation Portfolio

The majority of the Army's echelons above brigade (EAB) transportation capability resides within the AR. The portfolio consists of motor transport and watercraft platforms. The USAR provides over 43 percent of motor transport units, comprising light, medium, and heavy TWVs.

Investments in New Procurement and Modernization: In FY 2019 and FY 2020, base budget funding ($265.6 million) accounted for 77 percent of total TWV portfolio investments ($346.2 million), with NGREA funding ($80.6 million) accounting for critical modernization gaps. Increased funding in FY 2021–FY 2024 ($399 million) reflects investments focused on trailer and Medium Tactical Vehicle modernization and JLTV production (see Table 2-21).

Table 2-21. Tactical Wheeled Vehicles Procurement Funding

Funding Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Base Budget (P-1R)	$27M	$238.6M	$167.2M	$95.3M*	$41.4M*	$95.1M*
NGREA Investment	$80.6M*	$0M				

* Projected

The current fiscal environment creates funding gaps for fleet modernization in the near to mid-term, but provides a funding solution to upgrade 50 percent of legacy fleets to meet armor-capable strategy goals. The USAR has utilized NGREA funding to exceed the 50 percent armor capable goal with most fleets at or above 70 percent. The armor-capable LTV fleet remains only 36 percent armor capable. Delayed investments in new procurement and recapitalization programs will increase the sustainment costs required to maintain the readiness levels of the legacy TWV fleet and will risk interoperability with the Total Force. Top unfunded shortfalls are listed in Table 2-22.

Table2-22. Tactical Wheeled Vehicles Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
JLTV	15,585	0	15,585	1,635	$50B
M915A5*	2,414	985	1,429	985	$500M
M872A4 Semitrailer Flatbed (34 Ton)*	1,700	1,375	825	1,472	$13M

* Critical Dual Use Equipment

Transportation Focal Points:

- The current USAR LTV fleet will remain HMMWV-centric and approximately 36 percent armor-capable through at least FY 2021, when the USAR is projected to begin JLTV fielding in greater quantities. The USAR will have 10 percent of the current JLTV requirement on-hand by the close of FY 2023.
- Production of the armor-capable M915A5 Line-Haul Tractor ceased before USAR fleet shortages and modernization requirements were fulfilled. There is no plan to restart production of this critical theater opening capability until FY 2028, leaving only 41 percent of the total USAR line haul fleet capable of global deployment to a non-permissive threat environment.
- The M872A4 Semitrailer (34 Ton) investment strategy is limited to modernizing 87 percent (1,472 of 1,700) of the total USAR legacy fleet by FY 2023. The USAR Ready Force requirement is 1,520 (48 short of planned procurement total). Production of the M872A4 trailer is expected to continue through FY 2026. Additionally, the Army is exploring options

to consolidate the medium tactical trailer fleet into a single variant. However, new program procurement is not expected to start before FY 2023.

d. Mobility and Engineering Portfolio

The USAR provides 36 percent of the Army's EAB Mobility structure. The portfolio consists of construction, tactical bridging, engineer support, command and control, mines and munitions, counter explosive hazard, and armored vehicle systems.

Investments in New Procurement and Modernization: In FY 2019 and FY 2020, the Army's base budget procurement funding ($169 million) accounts for 75 percent of the total Mobility portfolio investments ($226 million), with NGREA funding ($57 million) accounting for critical modernization gaps. Increased funding in FY 2021–FY 2024 ($425.5 million) reflects investments in USAR combat mobility systems, particularly the Joint Assault Bridge (see Table 2-23.)

Table2-23. Mobility Procurement Funding

Procurement Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Base Budget (P-1R)	$93M	$76M	$96.7M	$127.2M*	$127.7M*	$73.9M*
NGREA Investment	$57M*	$0M				

* Projected

The Army's near to mid-term base budget strategy remains focused on resetting and modernizing engineer capabilities resident in BCTs and assumes greater risk in EAB enabler equipment acquisition. Extending procurement timelines for mission essential Mobility equipment is directly impacting USAR readiness posture by burdening USAR with maintaining less optimal legacy platforms well beyond EUL and creating capability gaps with the Total Force. Top mobility unfunded equipment modernization shortages are listed in Table 2-24.

Table 2-24. Mobility Top Equipment Shortages and Modernization Challenges

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
Joint Assault Bridge (JAB)*	36	0	36	32	$216M
CBT*	504	280	224	336	$67M
Heavy Dump Truck–20 Ton*	357	0	357	139	$69M
Semitrailer Low Bed: (40 Ton)*	880	695	185	70**	$81M

* Critical Dual Use Equipment **Most modern variant

Mobility and Engineering Focal Points:

- The JAB replaces the legacy 60-year old Armored Vehicle Assault Bridge platform. USAR projected to begin fielding JAB in FY 2022. The Combat Engineer Company Force Design Update adjusted the USAR requirement down from 96 to 36 beginning FY 2021.

- Base budget and NGREA funding enabled the USAR to modernize six of nine Multi-Role Bridge Companies with Common Bridge Transporters in FY 2017–FY 2020. No additional base funding to modernize remaining systems is currently projected.
- The Heavy Dump Truck (20 Ton) investment strategy is limited to modernizing approximately 14 percent (49 of 357) of the total USAR legacy fleet to an armor-capable variant by FY 2023. FY 2019 NGREA funding will be used to modernize an additional 25 percent (90 of 357) to an armor capable variant by FY 2022.
- Semitrailer Low Bed (40 Ton) M870A0 and A1 variants are beyond EUL and the overall average age of the fleet is 32 years. Eighty-nine percent (619 of 695) of the Army Reserve Fleet are A0 and A1 models requiring upgrade to the M870A4 variant.

e. Field Logistics Portfolio

This portfolio comprises maintenance, medical, bulk supply, and liquid logistics capabilities, the majority of which are CDU items. Nearly 65 percent of the Army's sustainment capabilities reside in the AR. Unique USAR capabilities include 92 percent of the Total Army's bulk petroleum support, 88 percent of general supply, 49 percent of its water storage/distribution, and 59 percent of its medical capabilities.

Investments in New Procurement and Modernization: FY 2019 and FY 2020 Army base budget procurement funding ($41.4 million) accounted for 93 percent of total Field Logistics portfolio investments ($44.7 million), with NGREA funding ($3.3 million) critical modernization gaps. Increased funding in FY 2021–FY 2024 ($207.1 million) reflects investments modernizing medical systems/equipment, fuel/water storage and distribution systems, maintenance tool/diagnostic sets, and material handling equipment (see Table 2-25).

Table 2-25. Logistics Procurement Funding

Procurement Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Base Budget (P-1R)	$17.4M	$24M	$45M	$60.4M*	$52.3M*	$49.4M*
NGREA Investment	$3.3M*	$0M				

* Projected

Field Logistics portfolio funding has slightly increased, but significant challenges continue to impact readiness and interoperability. Critical shortages and modernization gaps within water and petroleum delivery/storage capabilities will persist until planned FY 2023 and beyond funds are executed. The lack of nearer-term investment to modernize water purification, storage, and distribution platforms at the EAB level degrades the early entry and theater-opening storage capacity and bulk distribution required to support joint forces in a non-permissive environment. The consequence is a move toward "pull" distribution, which slows advancing tactical movement and adversely affects combat lethality. Top equipment modernization shortages are listed in Table 2-26.

Table 2-26. Field Logistics Critical Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
Bulk Fuel Distribution System	1,140	0	1,140	502	$66M
Water Purification: Reverse Osmosis 3000 GPH*	78	31	47	31	$56M
Mobile Tactical Refueling System	1,034	73	961	239	$47M
Rough Terrain Forklift–5K*	957	418	539	592	$38M
Water Tank–2000 Gal (HIPPO)*	490	56	434	179	$34M

* Critical Dual Use Equipment

Field Logistics Focal Points:

- The USAR owns 50 percent of the Water Support Company Structure in the Army. The current 3000 GPH Reverse Osmosis Water Purification Unit is fielded at 39 percent, with repair parts obsolescence resulting in operational ready rates below 75 percent. There is currently no new contract in place for the new 3K Tactical Water Purification System (TWPS). TWPS funding is not planned until after FY 2024.
- Investments in the 2,000 gallon Load Handling System–Compatible Water Tank Rack System (HIPPO) have been delayed by follow-on contract implementation and limited resources. A new contract is expected to be awarded in April 2021 and fielding is expected to resume in FY 2022.
- Army will begin modernizing the legacy 7,500 gallon bulk fuel trailer which is beyond EUL with a new 8,500 gallon trailer in FY 2021. The USAR owns 100 percent of the requirement for this critical theater-opening capability. This new trailer will also replace the 5,000 gallon line haul bulk fuel trailers (M967 5K Tanker).
- The USAR will begin fielding the Joint Assault Bridge (Abrams chassis) by FY 2023 and requires an organic diagnostic capability to maintain them. It is imperative the USAR is either cascaded the Army's Direct Support Electrical Systems Test Sets when the Army modernizes with the Next Generation Automated Test System (NGATS) or receives funding for NGATS.

Medical Focal Points:

- The Combat Support Hospital continues its transition to the Hospital Center configuration. Currently, two Regional Training Sites are receiving the modernized equipment needed to sustain medical readiness through collective training opportunities.
- The newly converted Hospital Centers at each training site will consist of two Headquarters and Headquarters Detachment (HHD)/Hospital Centers, three Field hospitals, one Surgical Detachment, one Medical Detachment, and two Intermediate Care Wards.
- Risk is mitigated by fielding required minimal equipment maintained at three Regional Training Sites-Medical (RTS-MED). These RTS-MED sites support all the Multi-component

and Joint collective training requirements. A total resource shortfall of $66 million exists to modernize all three sites.

f. Force Protection and Soldier Portfolios

The Force Protection portfolio consists of CBRNE Defense, Civil Affairs and Military Information Support Operations, and Military Police. The Soldier portfolio consists of individual and crew items required for combat.

Investments in New Procurement and Modernization: FY 2019 and FY 2020 Army base budget procurement funding ($55.8 million) accounts for 100 percent of the total Force Protection and Soldier portfolio investments, as NGREA is not currently slated to fund any critical modernization gaps. Increased funding in FY 2021–FY2024 ($211.7 million) reflects investments modernizing individual Soldier weapons and Nuclear, Biological and Chemical protection equipment as depicted in Table 2-27.

Table 2-27. Force Protection and Soldier Procurement Funding

Funding Source	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Force Protection Base Budget (P-1R)	$7.8M	$2.2M	$1M	$2.3M*	$5.4M*	$2.6M*
Soldier Base Budget	$27.7M	$18.1M	$133K	$23M*	$18.4M*	$26M*
Soldier NGREA Investment	$0M*	$0M				

* Projected

Limited funding for force protection modernization programs increases the risk that biological detection and protection capabilities will be unable to provide responsive support for HD and DSCA missions and limits the AR's ability to bolster force protection posture. The AR's top critical shortages within the Force Protection and Soldier portfolios are listed in Table 2-28.

Table 2-28. Force Protection and Soldier Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2024 On-Hand Projected	Unfunded Requirement
Rifle 5.56mm: M4A1	142,607	76,725	65,882	126,885	$42M
Pistol M17: Piston 9mm	30,021	6,609	23,712	30,021	$4M

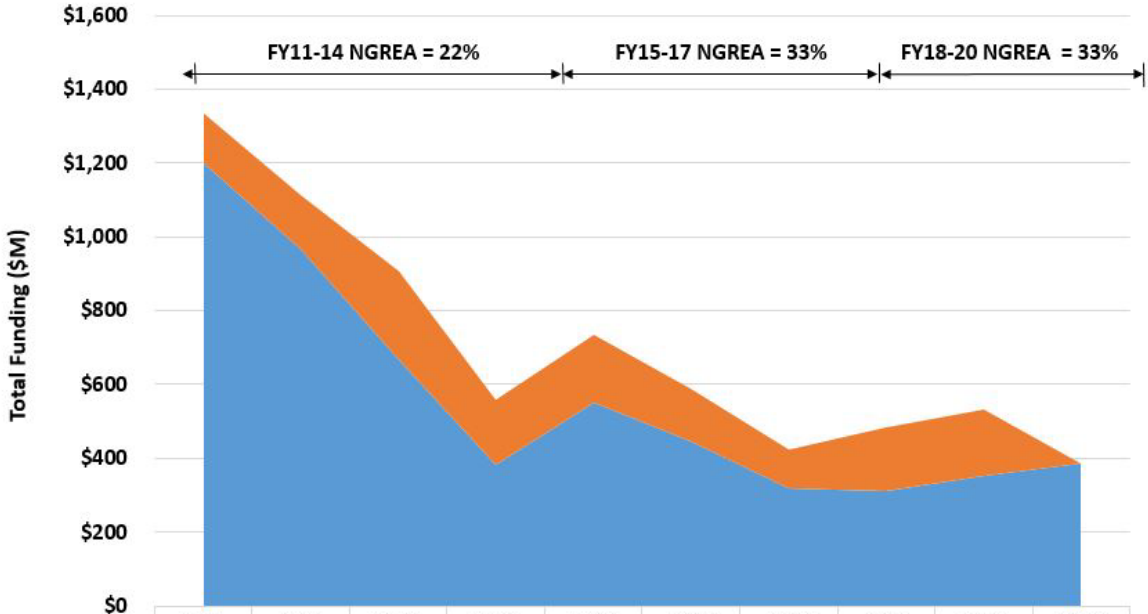
Force Protection and Soldier Focal Points:

- Forty-six percent of current on-hand carbines are obsolete M16 models identified for divestment. However, the current Army plan is funded and projected to be pure fleet by 4th QTR FY 2022.
- Seventy-nine percent of current on-hand pistols are obsolete M9 models identified for divestment. However, the current Army plan is funded and projected to be pure fleet by 4th QTR FY 2022.

C. National Guard and Reserve Equipment Appropriation

Figure 2-1 provides a comparison between base and above base funding, depicting the positive impact of NGREA. The FY 2018 and FY 2019 total NGREA of $290.3 million provided investments of $184 million in Tactical Wheeled Vehicles; $31.3 million in Field Logistics; and $62 million in Command and Control Systems, with the remaining funding dispersed among training devices and CDU items. NGREA for FY 2018 and FY 2019 accounts for 53 percent of the total equipment budget allocated to the AR.

Figure 2-1. Army Reserve Base vs. NGREA Funding



	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
NGREA %	12%	15%	36%	46%	34%	31%	33%	54%	51%	0%
NGREA	$138	$145	$240	$175	$185	$140	$105	$169	$180	$0
Base Budget	$1,198	$968	$667	$382	$551	$447	$320	$313	$351	$385

D. Summary

The USAR supports the Army Campaign Plan through a concept of operations that leads toward the Chief of Army Reserve's vision of the USAR by 2028. The USAR of 2028 will provide trained and equipped units and personnel at the scale and speed required to support the Total Force in the joint, multi-domain operational environment. Moving toward this vision, the USAR will continue to build the most capable, combat-ready reserve in the history of the nation and provide mission-critical forces and capabilities the Army needs to fight, survive, and win on the battlefield from day one. The United States faces a new era of great power competition, new concepts of warfare that challenge across every domain—land, sea, air, space and cyber space—and thus new threats to its freedom and security. Purposefully designed to enable forces, the USAR remains committed to achieving readiness objectives that allow seamless integration with the Total Force. To prepare for future challenges, the USAR will continue to optimize processes and prioritization to deliver modern enabler capabilities in support of MDO; invest in responsive capabilities to enhance equipping posture for large scale combat operations, HD, and DSCA; and

advocate for the development of future enabler capabilities to accelerate interoperability and holistically identify and forecast resource gaps.

USAR

Table 1

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. Unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Air Defense							
Center: Communications Operations	C18033	$3,648,500	5	5	5	5	5
Radio Set: AN/USQ-140(V)2(C)	R42399	$300,000	3	3	3	3	5
Aircraft							
Airplane Cargo Transport: C-12F	A30062	$3,068,422	16	16	16	16	32
CH-47F Improved Cargo Helicopter	C15172	$30,000,000	27	27	27	27	36
Helicopter Utility: UH-60L	H32361	$16,967,644	112	112	112	112	114
MEDEVAC Helicopter: HH-60M	M33458	$16,967,644	29	29	29	29	30
Small Unmanned Aircraft System: Raven B	S83835	$180,000	70	71	71	71	78
Utility Cargo Aircraft: UC-35A	U05004	$20,000	9	9	9	9	16
Aviation							
Battle Damage Assessment and Repair Sys: BDAR	B85617	$110,000	14	14	14	14	17
Command System: Tactical AN/TSQ-221	C61597	$3,000,000	2	2	2	2	2
Communication System: Tactical Terminal Control System (TTCS)	C59125	$998,000	4	4	4	4	4
Power Unit Auxiliary: Aviation Multi-Output Gted (AGPU)	P44627	$1,000,000	16	16	16	16	24
Radar Set: AN/TPN-31	R17126	$3,701,502	2	2	2	2	2
UH-60 External Stores Subsystem (ESSS)	E21985	$676,111	0	0	0	0	0
Battle Command Command and Control (C2)							
Command System Tactical	C40996	$870,000	6	6	6	6	14
Battlespace Awareness							
Central: Communications AN/TSQ-226(V)2	C43331	$800,000	1	-	-	-	4
Detecting System Countermeasures: AN/MLQ-40(V)4	D04182	$1,100,000	10	-	-	-	16
Digital Topographic System: AN/TYQ-67(V)	D10281	$800,000	5	5	5	5	24
Ground Station Tactical Intelligence: AN/TSQ-179	T37036	$4,644,000	0	-	-	-	4
Battle Command Transport							
Antenna: BB-1404/TRC	A81826	$1,066,695	27	27	27	27	36
Central Office: Telephone Automatic	C20617	$4,081,375	10	10	10	10	12
Joint Node Network (JNN) Central Office Telephone Auto	J05001	$925,000	28	28	28	28	37
Radio Terminal Set: AN/TRC-170 (V)3	R93035	$2,233,375	16	16	16	16	24
Radio Terminal: Line of Sight Multi-channel AN/TRC-190E(V)1	R90451	$2,472,271	128	128	128	128	170
Radio Terminal: Line of Sight Multi-channel AN/TRC-190F(V)3	R90587	$2,472,271	63	74	76	76	76
Satellite Communication System: AN/TSC-156	S23268	$4,000,000	21	21	21	21	36
Teleconference System: AN/TYQ-122	T43146	$5,282	48	48	49	49	51
Terminal: Satellite Communication AN/TSC-155	T81733	$4,411,733	6	6	6	6	13
Combat Mobility							

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Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Anti-Personnel Mine Clearing System: Remote Control (M160)	A05002	$11,142	24	24	24	24	24
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	$224,258	84	84	84	84	84
Boat: Bridge Erection	B05006	$826,128	14	14	14	14	42
Bridge Armored Veh Launched Scissors: 63-ft (AVLB) MLC 70	B31098	$7,645,450	41	36	36	36	36
Bridge Heavy Dry: Supt (HDSB) 40M MLC96	B26007	$1,869,741	36	36	36	36	36
High Mobility Engineer Excavator (HMEE) Type I	H53576	$458,000	160	160	160	160	267
Interior Bay Bridge Floating	K97376	$435,703	270	270	270	270	270
Launch M60 Series Tank Chass Trnsptg: 40 & 60 ft Bridge Ty CL60	L43664	$527,126	96	-	-	-	-
Launcher Heavy Dry Support Bridge (HDSB)	L67660	$10,631,000	36	36	36	36	36
Loader Scoop Type: 2.5 Cubic Yard	L76897	$99,515	31	31	31	31	31
Loader Scoop Type: DSL 2-1/2 cu-yd Hinge Frame w/Multipurpose Bucket	L76556	$141,500	3	3	3	3	22
Loader Scoop Type: Heavy Type II Loader	L15041	$250,000	60	60	60	60	78
Loader Skid Steer: Type III	L77147	$53,548	175	175	175	175	175
Loader Skid Steer: Type III	L77215	$349	331	331	331	331	312
Medium Flail	M05031	$664,971	24	24	24	24	24
Mine Protected Clearance Vehicle	M05004	$1,451,707	66	72	72	72	78
Ramp Bay Bridge Floating	R10527	$525,068	108	108	108	108	108
Tractor Wheeled: DSL 4X4 w/Excavator & Front Loader	T34437	$328,201	3	3	3	3	10
Tractor Wheeled: Industrial	T34505	$328,201	168	168	168	168	168
Transporter Common Bridge	T91308	$280,613	193	193	193	193	336
Vehicle Mounted Mine Detection (VMMD) System	V05001	$2,828,522	132	144	144	144	156
Field Logistics							
Assault Kitchen	A94943	$65,000	106	106	106	106	107
Force Provider Module: Houses 550 Soldiers Transportable	F28973	$4,650,000	2	2	2	2	6
Forward: Repair System (FRS)	F64544	$285,591	206	204	203	202	202
Fuel System Supply Point: FSSP Type 3 120K	F04898	$33,000	82	82	82	82	82
Kitchen Field Trailer-mtd: mtd on M103A3 Trailer	L28351	$351,688	533	514	512	509	509
Laundry Advanced System (LADS): Trailer-mtd	L70538	$1,022,444	103	103	103	103	108
Modular Fuel System-Tank Rack Module with Retail Capability	T20131	$78,038	31	31	31	31	42
Petroleum Quality Analysis System: Enhanced	P25743	$1,770,000	21	21	21	21	21
Rough Terrain Container Handler: Kalmar RT240	R16611	$868,103	334	334	334	334	375
Shower: Portable 12 Head	S62898	$1,200,000	125	125	125	125	125
Tactical Water Purification System (TWPS) 1500 gph	T14017	$455,871	33	33	33	33	40
Trailer Tank Water (Camel): 800 gal 5-ton W/E	T05047	$106,532	2	2	2	2	2
Trailer Tank Water: 400-gal 1.5-ton 2-wheel	W98825	$85,825	992	992	992	992	1,688
Water Purification: Reverse Osmosis 3000-gph Trailer-mtd	W47225	$455,871	28	28	28	28	78
Force Protection							
Alarm Biological Agent Automatic: (BIDS) M31A2	A48680	$1,408,429	350	322	266	210	210
CBRN Dismounted Reconnaissance: (SKO)	C05051	$1,410,000	42	42	42	42	42
Chemical-Biological Protective Shelter (CBPS): M8	C07506	$1,635,636	1	1	1	1	20

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Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
JBAIDS Augumentation Set:	J05007	$500,000	2	2	2	2	40
Mask Chemical-Biological: M45	M12736	$466	1,384	1,384	1,384	1,384	1,395
Mask Chem-Bio Joint Service General Purpose: Field M50	M12986	$400	133,998	134,697	164,266	133,821	133,863
Mask Chem-Bio Joint Service General Purpose: Combat Vehicle Crewman M51	M13236	$400	2,152	1,773	1,773	1,773	1,773
Nuclear Biological Chemical Recon Vehicle (NBCRV)	N96543	$8,024,127	56	56	56	56	64
General Engineering							
All Terrain Crane Type II: (Heavy)	Z05089	$1,628,875	0	0	0	0	6
Crane Wheel-mtd: Hydraulic Light 7.5-ton w/Cab	C36151	$165,922	24	24	24	24	25
Crane: Wheel Mounted Hydraulic 25-ton All Terrain AT422T	C36586	$382,000	81	81	81	81	81
Engineer Mission Module-Water Distributor (EMM-WD): Type II	E05007	$668,953	139	139	139	139	172
Excavator: Hydraulic Type I Multipurpose Crawler Mount	E27792	$348,371	80	80	80	80	80
Hydraulic Electric Pneumatic Petroleum Operated Equip (HEPPOE)	H05004	$230,000	229	229	229	229	229
M1158 Truck: HEMTT Based Water Tender	M31997	$668,953	42	42	42	42	42
Motorized Grader	M05001	$253,000	147	147	147	147	169
Paving Machine: Bituminous Material	P05023	$2,773,125	6	6	6	6	6
Scraper Earth Moving Self-Propelled: 14-18 Cu Yd (CCE)	S56246	$745,000	7	7	7	7	7
Scraper Earthmoving: 14-18 Cu Yd	S05029	$796,100	142	142	142	142	191
Scraper Elevating: Self Propelled 9-11 Cu Yd Sectionalized	S30039	$441,923	29	29	29	29	36
Tactical Water Distribution Equip Set: (TWDS-RDF)	T09094	$350,000	4	4	4	4	6
Tractor Full Tracked Low Speed: T9 Type II w/Ripper	T05016	$325,000	117	129	129	129	129
Tractor FT LS: T-5 Type II W/Ripper	T05026	$311,000	12	12	12	12	12
Tractor FT HS: Armored Combat Earthmover (ACE)	W76473	$887,050	44	48	48	48	48
Tractor FT HS: Deployable LT Engineer (Deuce)	T76541	$398,000	9	9	9	9	12
Tractor Full Tracked Low Speed: T5	T05029	$311,000	12	12	12	12	12
Tractor Full Tracked Low Speed: T9	T05015	$316,096	230	230	230	230	286
Truck: Tactical Firefighting 8X8 Hvy Exp Mov	T82180	$878,461	70	70	70	70	70
Maneuver							
Carrier Armored Command Post: Full Tracked	C11158	$374,000	25	25	25	25	31
Carrier Command Post: Light Tracked	D11538	$345,787	15	-	-	-	-
Carrier Personnel Full Tracked: Armored (RISE)	C18234	$511,343	245	110	110	110	110
Recovery Vehicle Full Tracked: Medium	R50681	$3,593,524	40	25	25	25	25
Medical							
Computerized Tomography Scanner Field	C79284	$1,284,215	0	0	0	0	28
Dental Materiel Set Oral: Maxillofacial Surgery	D65925	$1,253,538	0	0	0	0	12
Medical Materiel Set Central Materiel Service	M08417	$1,953,635	9	9	9	9	36
Medical Materiel Set Maxo -Facial head Neck Surg Augmentation	M09098	$1,247,818	5	5	5	5	6
Medical Materiel Set Medical Supply: 164 Bed CSH Co	M14585	$986,686	0	0	0	0	24
Medical Materiel Set Neurosurgery Augmentation: DEPMEDS	M48305	$211,674	5	5	5	5	6
Medical Materiel Set Pharmacy: 84 Bed CSH Co	M73254	$287,517	1	1	1	1	16

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Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Medical Materiel Set Post-Op/ICU Ward	M09576	$1,445,922	16	16	16	16	64
Medical Materiel Set Radiology Computerized Tomography	M09826	$908,000	4	4	4	4	28
Medical Materiel Set Triage/Emergency/Pre-Op	M73050	$975,265	23	23	23	23	24
MES Forward Surgical Team:	M45375	$1,951,907	22	22	22	22	22
Soldier Systems							
Armament Subsystem: Remotely Operated	A90594	$236,751	399	399	399	399	716
Mini Eyesafe Laser IR Observation Set (MELIOS): AN/PVS-7	M74849	$22,015	125	106	106	106	106
Soldier Weapons							
Carbine 5.56mm: M4A1	C06935	$1,772	72,614	72,614	72,614	72,614	119,441
Command Launch Unit: (Javelin) 13305405-119	C60750	$243,732	90	90	90	90	115
Launcher Grenade: M320A1	L69080	$4,876	7,282	7,336	7,272	7,208	7,208
Machine Gun 5.56mm: M249	M09009	$4,298	11,295	11,392	11,348	11,301	11,305
Machine Gun: 7.62mm M240L	M92454	$14,404	189	189	189	189	258
Machine Gun 7.62mm: M240H	M92591	$11,597	276	276	276	276	276
Machine Gun Caliber .50: HB Flexible (Ground & Vehicle) W/E	L91975	$11,005	678	677	660	658	658
Machine Gun: Caliber .50 Heavy Fixed Turret Type	L91701	$15,259	105	120	120	120	120
Machine Gun Grenade 40mm: MK19 Mod III	M92362	$17,085	1,593	1,571	1,565	1,561	1,561
Machine Gun: 7.62mm M240B	M92841	$14,404	7,055	7,067	7,047	7,023	7,023
Machine Gun: Caliber .50	M39331	$12,786	4,103	4,103	4,103	4,103	4,958
Machine Gun: Light 5.56mm M249	M39263	$4,298	2,519	2,519	2,519	2,519	3,104
Pistol 9mm: M11	P47365	$426	521	521	521	521	791
Pistol 9mm Automatic: M9	P98152	$426	23,960	23,960	23,960	23,960	24,137
Strike							
Command and Control System: AN/TSQ-284 (HCCC)	C05019	$8,807,000	0	0	0	0	5
Crane Barge: 89 to 250 ton	F36090	$8,000,104	0	0	0	0	0
Trailers							
Light Tactical Trailer: 3/4 ton	T95992	$27,859	5,383	5,514	5,457	5,399	5,399
Palletized Load System: Trailer-CTE	P05025	$109,794	265	265	265	265	316
Semitrailer Flatbed: Breakbulk/Container Transporter 34-ton	S70159	$105,069	1,001	1,001	1,001	1,001	1,720
Semitrailer Low Bed: 25-ton 4-wheel W/E	S70517	$179,778	94	94	95	97	97
Semitrailer Low Bed: 40-ton 6-wheel W/E	S70594	$104,444	682	682	682	682	935
Semitrailer Low Bed: 70-ton HET	S70859	$610,664	480	480	480	480	480
Semitrailer Tank: 5000-gal Bulk Haul Self-Load/Unload	S10059	$85,000	1,035	1,035	1,035	1,035	1,320
Semitrailer Tank: 5K gal Fuel Dispensing Automotive W/E	S73372	$97,000	433	433	433	433	433
Semitrailer Tank: Petroleum 7500-gal Bulk Haul	S73119	$198,020	391	391	391	391	420
Semitrailer Van: Supply 12-ton 4-wheel W/E	S75175	$84,466	57	57	57	57	57
Trailer Bolster: General Purpose 4-ton 4-wheel W/E	W94536	$9,618	192	172	172	172	172
Trailer Cargo: 1-1/2 ton 2-wheel W/E	W95811	$50,433	1	1	1	1	27
Trailer Cargo: High Mobility 1-1/4 ton	T95924	$9,615	2,211	2,211	2,211	2,211	210
Trailer Cargo: MTV W/Dropsides M1095	T95555	$50,433	2,292	2,302	2,300	2,298	2,298
Trailer Flat Bed: M1082 Trailer Cargo LMTV W/Dropsides	T96564	$38,200	1,584	1,591	1,590	1,589	1,589

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Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Trailer: Flat Bed	T64618	$55,875	11	11	11	11	70
Trailer: Palletized Loading 8X20	T93761	$88,639	3,001	2,909	2,849	2,789	2,789
Trucks							
Armored Security Vehicle (ASV): Wheeled	A93374	$1,019,000	204	246	246	246	246
Tractor Line Haul: M915A5	T88858	$162,968	961	985	985	985	1,021
Truck Ambulance: 4-Litter Armored HMMWV	T38844	$96,466	475	475	475	475	510
Truck Cargo: 5-ton 6X6 MTV W/E LAPES/AD	T41036	$210,180	5	5	5	5	5
Truck Cargo: 5-ton WO/Winch	T41515	$301,989	2,649	2,643	2,642	2,638	2,638
Truck Cargo: LWB WO/Winch	T93271	$309,428	216	206	198	190	190
Truck Cargo: M985A4	T59380	$575,000	108	78	78	78	78
Truck Cargo: Tactical 8X8 HEMTT w/LHS	T96496	$367,575	94	94	94	94	94
Truck Cargo: WO/Winch	T59448	$157,982	1,789	1,774	1,772	1,772	1,772
Truck Dump: 10-ton W/Winch	T65274	$383,892	87	87	87	87	87
Truck Dump: 10-ton WO/Winch	T65342	$322,656	498	498	498	498	498
Truck Dump: 20-ton DED 12 cu-yd Cap (CCE)	X44403	$211,764	232	232	232	232	357
Truck Materials Handling-Container Hoisting: M1148A1P2	T54516	$899,231	14	14	14	14	14
Truck Palletized (LHS): M1120A4	T55054	$550,000	570	570	570	570	570
Truck Tank: Fuel Servicing 2500-gal 8X8 HEMTT	T87243	$499,182	19	19	19	19	19
Truck Tank: WO/Winch	T58318	$597,000	323	323	323	323	377
Truck Tractor: M107A1	T05012	$550,000	288	288	288	288	288
Truck Tractor: LET	T60946	$616,000	889	891	891	891	931
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	$667,821	122	122	122	122	192
Truck Tractor: LET 6X6 66000 GVW W/W C/S	T91656	$250,614	13	13	13	13	13
Truck Tractor: Line Haul C/S 50000 M915	T61103	$162,698	1,440	1,440	1,440	1,440	1,440
Truck Tractor: MTV W/E	T61239	$262,509	364	364	365	367	367
Truck Tractor: WO/Winch	T88983	$294,508	821	822	822	822	833
Truck Utility ECV TOW/ITAS Carrier - Armor Ready: M1167	T34840	$207,760	8	8	8	8	8
Truck Utility Expanded Capacity Enhanced 4X4: M1165A1	T56383	$153,760	1,420	1,407	1,407	1,407	1,407
Truck Utility Expanded Capacity Enhanced: M1152A1	T37588	$153,760	1,454	1,457	1,457	1,457	1,457
Truck Utility: ECV Armament Carrier - Armor Ready M1151A1	T34704	$129,376	3,637	3,507	3,507	3,507	3,754
Truck Utility: Heavy Variant HMMWV 10000 GVW W/E	T07679	$153,760	8,197	7,915	7,786	7,656	7,656
Truck Van: M1079A1P2 WO/Winch	T62359	$232,284	199	199	199	199	199
Truck Wrecker	T94671	$532,292	125	121	119	117	117
Truck Wrecker: M984A4	T63161	$763,000	434	434	434	434	439
Truck Wrecker: MTV W/E W/W	T94709	$502,536	67	66	67	69	69
Truck Wrecker: Tactical 8X8 HEMTT W/Winch	T63093	$886,000	0	0	1	3	3
Truck: Expandable Van WO/Winch	T67136	$372,440	236	236	236	236	252
Truck: Palletized Loading System (PLS)	T81874	$678,000	114	114	114	114	308
Truck Wrecker: MTV W/E W/W	T94709	$690,707	24	24	24	24	24
Truck Wrecker: Tactical 8X8 HEMTT W/Winch	T63093	$886,000	98	98	98	98	98
Truck: Expandable Van WO/Winch	T67136	$372,440	227	227	227	227	251

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Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Truck: Palletized Loading System (PLS)	T81874	$418,000	732	732	732	732	732

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Average Age of Equipment

Table 2

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2019. Logistics Information Warehouse Data Base (LIWDB) convergence with Program Manager (PM) Army Enterprise System Integration Program (AESIP) resulted in the inability to retrieve Average Age of Equipment data.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Airplane, Utility, UC-35B	A05015	18	Not on Table 1
CH-47F Improved Cargo Helicopter	C15172	8	
Helicopter Utility, UH-60L	H32361	25	
Helicopter, Medevac, HH-60M	M33458	8	
Utility Cargo Aircraft UC-35A	U05004	22	
Combat Mobility			
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	21	
Armored Vehicle Launched Bridge (AVLB) Scissors: 63-ft MLC 70	B31098	23	
Interior Bay Bridge Floating	K97376	10	
Launch M60 Series Tank Chassis Transpt: 40/60ft Bridge	L43664	40	
Loader Scoop Type: DSL 2-1/2 cu yd w/Multi Purp Bucket	L76556	33	
Ramp Bay Bridge Floating	R10527	9	
Tractor Wheeled: DSL w/Excavator & Front Loader	T34437	29	
Transporter Common Bridge	T91308	17	
Field Logistics			
Kitchen Field Trailer-mtd Mtd on M103A3 Trailer	L28351	26	
Laundry Advanced System (LADS) Trailer-mtd	L70538	14	
Water Purification: Reverse Osmosis 3000-gph Trailer mtd	W47225	24	
Trailer Tank Water: 400-gal 1-1/2 ton	W98825	41	
General Engineering			
Crane: Whl-mounted Hydraulic 25-ton All Terrain AT422T	C36586	18	
Tractor FT HS: Deployable Lt Engineer (DEUCE)	T76541	19	
Excavator: hydraulic Type 1 Multipurpose Crawler	E27792	23	
Maneuver Combat Vehicles			
Carrier Personnel Full Tracked: Armored (RISE)	C18234	34	
Carrier Armoed Command Post: Full Tracked	C11158	33	
Trailers			
Semitrailer Tank: 5K-gal Bulk Haul Self-Load/Unload	S10059	26	
Semitrailer Flatbed: Breakbulk/Container Transporter 34-ton	S70159	30	
Semitrailer Low Bed: 25-ton 4-wheel	S70517	49	
Semitrailer Low-bed: 40-ton 6-wheel	S70594	27	
Semitrailer Low-bed: 70-ton Heavy Equip Transporter (HET)	S70859	21	
Semitrailer Tank: Petroleu 7500-gal Bulk Haul	S73119	27	
Trailer Cargo: High Mobility 1-1/4-ton	T95924	10	

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Average Age of Equipment

Table 2

Nomenclature	Equip No.	Average Age	Remarks
Trucks			
Truck Ambulance: 4-Litter Armored HMMWV	T38844	10	
Truck Dump: 20 Ton DSL 12 cu yd Capacity (CCE)	X44403	25	
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	23	
Truck Tractor: Line Haul C/S 50000 M915	T61103	25	
Truck utility: Cargo/Troop Carrier HMMWV	T61494	26	Not on Table 1
Truck Utility: Expanded Capacity Up-armored HMMW	T92446	15	Not on Table 1
Truck Tank: Fuel Servicing 2500-gal 8x8 Heavy Expanded Mob	T87243	23	
Truck Tractor: MTV W/E	T61239	17	
Truck Wrecker: Tactical 8x8 Heavy Expanded Mobility w/ Winch	T63093	20	

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Table 3

Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2022 would be expected to arrive in RC inventories in FY 2023 or FY 2024. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
FY 2019 NGREA Equipment			
Mission Command			
Command and Control Systems	$8,000,000		
Tactical Radio Platform	240,000		
Tactical Networking System	800,000		
Satellite Communications (SATCOM) System	1,500,000		
Tactical Digital Media	1,500,000		
First Responder Communication System	1,000,000		
Engineer			
Hydraulic, Electric, Pneumatic, Petroleum Operated Equipment (HEPPOE)	1,150,000		
Heavy Crane	1,250,000		
High Mobility Engineer Excavator (HMEE)	1,300,000		
T-9 Dozer	1,080,000		
Scraper	6,400,000		
Vertical Skills Construction Kit	980,000		
Assault Craft	80,000		
Assault Craft Motors	120,000		
Field Logistics			
Truck Lift Fork	3,750,000		
Mobile Tactical Retail Refueling System	1,870,000		
Load Handling System: 2000G Water (HIPPO)	7,000,000		
Water Production and Storage	1,000,000		
Medical Support Equipment	4,500,000		
Medical Equipment Sets	6,000,000		
Maintenance Support Device	900,000		
Tactical Wheeled Vehicles			
Light Tactical Vehicle Modernization (JLTVs and HMMWVs)	6,600,000		
Gunner Protection Kits	350,000		
Palletized Loading System	36,100,000		
HEMTT Modernization	36,400,000		
HEMTT Load Handling System	17,100,000		
Heavy Dump Truck	5,000,000		
Truck Tractor - Yard	600,000		
Medium Tactical Truck	3,960,000		
Medium Utility Trailer	5,000,000		
Light Utility Trailer	1,400,000		
Tactical Power			
Fuel Efficient/Clean Power Generators	1,600,000		
Power Distribution Systems	1,750,000		

Table 4

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
Environmental Control Unit	150,000		
Force Protection			
M4A1 Carbine	575,000		
Tactical Shelters	375,000		
Individual Tactical Equipment	1,000,000		
Simulators			
Modular Small Arms Range (MSAR)	9,000,000		
Marksmanship Trainer	1,600,000		
Medical Simulation	500,000		
Maintenance Trainer	20,000		
Transportation Reserve	500,000		
Total	**$180,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

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Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty
Aircraft				
Airplane Cargo - Tran: C-12F	A30062			
CH-47F Improved Cargo Helicopter	C15172			
Helicopter Utility: UH-60L	H32361			
Small Unmanned Aircraft System (USAS) Raven B (MIP)	S83835	+6	+1	
Aviation				
Power Unit Auxiliary: Aviation Multi-Output GTED (AGPU)	P44627			
Battle Command and Control				
Command System: Tactical	C40996			
Battlespace Awareness				
Central Communication/AN/TSQ226(V)2	C43331			
Detecting System Countermeasures; AN/MLQ-40(V)4	D04182			
Dig Topograph Sys: AN/TYQ-67(V)	D10281			
BC TRANSPORT NETWORKS				
Antenna: AB-1404/TRC	A81826			
Radio Terminal: Line of Sight Multi Channel AN/TRC-190e(V)1	R90451			
COMBAT MOBILITY				
Bridge Armored Vehicle Launched Scissors Ty: 63 Ft (AVLB) MLC 70	B31098	-	-5	-
Loader Scoop Type: 2.5 Cubic Yard	L76897			
Loader Scoop Type: Dsl 2-1/2cu Yd Hinge Frme w/ Multi Purp Bucket	L76556			
Transporter Common Bridge	T91308			
FIELD LOGISTICS				
Rough Terrain Container Handler (Rtch): Kalmar Rt240	R16611			
Showr: Portable 12 Head	S62898	-2		
Water Purification: Reverse OSM-OSIS 3000 Gph Trailer Mounted	W47225			
FORCE PROTECTION				
Nuclear Bio Chem Recon Veh (NBC-RV)	N96543			
MEDICAL FIELD SYSTEMS				
Dental Materiel Set Oral: Maxillofacial Surgery	D65925			
Medical Materiel Set Pharmacy: 84 Bed CSH Company	M73254			
SOLDIER SYSTEMS				
Mini Eyesafe Laser Infrared Observation Set (MELIOS): AN/PVS-6	M74849	-1	-19	
SOLDIER WPNS				

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Table 5

Projected Equipment Transfer/Withdrawal Quantities

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty
Launcher Grenade: M320A1	L69080	-28	+54	-64
Machine Gun: 7.62MM M240B	M92841	-193	+12	-20
Machine Gun: CALIBER 50	M39331			
STRIKE				
Computer System Digital: AN/GYK-56 (AFATDS)	C05018			
TRAILERS				
Trailer Flat Bed; M1082 TRLE Cargo LMTV w/ Dropsides	T96564	-7	+7	-1
TRUCKS				
Tractor Line Haul: M915A5	T88858		+24	
Truck Cargo; Tactical 8x8 Heavy Expanded mob w/ LHS	T96496	-6		
Truck Palletized (LHS): M1120A4	T55054			
Truck Tractor: Heavy Equipment Transporter (HET)	T59048			
Truck Tractor: Line Haul C/B 50000 GVWR 6x4 M915	T61103			
Truck Tractor; MTV W/E	T61239			+1
Truck Wrecker	T94671	+3	-4	-2

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Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is able to be deployed in wartime. This data meets the Title 10 requirement to identify equipment that is not the most desired item of equipment.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No
Aircraft						
Utility Cargo Aircraft: UC-35A	U05004	Airplane: Utility: UC-35B	A05015	5	X	
Combat Mobility						
Bridge, Heavy Assault Scissoring	B31098	Bridge Armor Veh Launch Scissor TY: CL 60 ALUM 60 FT L	C20414	25	X	
Loader Scoop Type: DSL 2-1/2CU YD Hinge Frame	L76556	Loader Scoop Type: 2.5 Cubic Yard	L76897	17	X	
TRANSPORTER COMMON BRIDGE:	T91308	TRANSPORTER, COMMON BRIDGE (CBT) M1977A4	T05067	127	X	
Tractor Wheeled: DSL 4X4 w/ Excavator & Front Loader	T34437	Tractor Wheeled: Industrial	T34505	7	X	
Field Logistics						
Rough Terrain Container Handler (RTCH): Kalmar RT240	R16611	Truck Lift Fork: DED 50K lb Container Handler Rough Terrain 48-in LC	T48941	16	X	
TRAILER TANK: WATER 400 GALLON 1-1/2 TON 2 WHEEL	W98825	TRAILER TANK WATER (CAMEL): 800 GAL 5 TON W/E	T05047	1	X	
Force Protection						
Chem-Bio Protective Shelter	C7506	Chem Bio Protective Shelter	C05093	15	X	
General Engineering						
Excavator; Hydraulic (HYEX) Multipurpose Crawler mount	E27792	Tractor Full Tracked Low Speed: DSL MED DBP w/ BULDOZ W/ SCARIF WINCH	W76816	8	X	
Tractor Full Tracked High Speed: Deployable LT Engineer	T76541	Tractor full racked low Speed: DSL MED DBP W/ BULDOZ W/ SCARIF WINCH	W76816	3	X	
ALL TERRAIN CRANE TYPE II: (HEAVY)	Z05089	CRANE: WHEEL MOUNTED HYDRAULIC 25 TON ALL TE	C36586	6	X	
ENGINEER MISSION MODULE-WATER DISTRIBUTO (EMM	E05007	DISTRIBUTOR WATER TANK TYPE: 6000 GL SEMITRAIL	D28318	7	X	
SCRAPER EARTHMOVING: 14-18 CU YD	S05029	SCRAPER EARTH MOVING SELF-PROPELLED: 14-18 CU	S56246	49	X	
Soldier Weapons						
Machine Gun: Caliber 50	M39331	Machine Gun Caliber 50: HB Flexible (Ground 7 Vehicle) W/E	L91975	802	X	
Trailers						
Palletized Load System: Trailer-CTE	P05025	Trailer: Palletized Loading 8x20	T93761	30	X	
Semitrailer Tank: 5000gal Bulk Haul Self-Load/Unload W/E	S10059	Semitrailer Tank: 5K-gal Fuel Dispensing Automotive W/E	S73372	165	X	
Trailer Cargo: 1-1/2 ton 2-wheel W/E	W95811	Trailer Flat Bed: M1082 Trailer Cargo LMTV w/ Dropsides	T96564	50	X	
Trailer Cargo: High Mobility 1-1/4 ton	T95924	Light Tactical Trailer; 3/4 ton	T92992	100	X	
Trucks						
Truck Tractor: heavy Equipment Transporter (HET)	T59048	Truck Tractor: M107A1	T05012	72	X	
Truck: Expandable Van WO/Winch	T67136	Truck Van; Expansible MTV W/E M1087A1	T41271	9	X	
TRUCK PALLETIZED (LHS): M1120A4	T55054	TRUCK CARGO: TACTICAL 8X8 HEAVY EXPANDED MOE	T39518	3	X	
TRUCK WRECKER: M984A4	T63161	TRUCK WRECKER: TACTICAL 8X8 HEAVY EXPANDED M	T63093	9	X	

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Table 8

Significant Major Item Shortages

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Joint Battle Command - Platform (JBC-P)	14,947*	12,057	$13K	$182M	Planned vs actual distribution by component varies within the year of execution based on the HQDA Unit Set Fielding (USF) prioritization model. As an enabler centric force, the Army Reserve does not historically compete well for resource prioritization as evident in the total quantity of JBC-P systems fielded. Since program inception in FY??, the Army Reserve has received ~2800 of 15,000 (19%) required items. Projected procurement & delivery time horizons extend into FY25. The Army Reserve is currently postured with ## legacy systems that allows units to conduct mission planning, but with degraded capabilities.
2	Load Handling System Compatible Water Tank Rack System (HIPPO)	490*	48	$130K	$60M	Army Reserve owns 50% of the EAB Water Support Units. The HIPPO provides the Army with the capability to receive, store and distribute potable water. Water production was eliminated from the BCT's, increasing distribution requirements from EAB units. Current O/H represents ~10% of total COMPO 3 requirement. COMPO 1 is currently fielded to ~88% and COMPO 2 is currently fielded to ~40%. Army Reserve requires 130 to support current Ready Force requirements.
3	Joint Light Tactical Vehicle (JLTV)	14,687*	11,479	$335K	$3.85B	The current Army Reserve light tactical vehicle fleet is composed of 64% non-armor capable & 36% armor variants, limiting the ability to globally deploy organic equipment to non-permissive threat environments. The JLTV will provide enhanced force protection & mobility for employment across the full spectrum of operations. The Army Reserve is scheduled to field 3,208 JLTV platforms through FY26, but will remain less than 50% armor capable across the entire fleet beyond FY30.
4	Line Haul Tractor - M915A5; 7.5K Petroleum Semitrailer	2820*	1,835	Varies	$533M	The Army Reserve owns 50% of the total Army line haul capability, to include 90% of the bulk petroleum transportation assets. The M915 contract expired in FY14 before Army Reserve completed fielding the M915A5 armor capable variant. Only 42% (985/2340) of the existing Army Reserve M915 fleet is armor capable. The entire 7,500 gallon tanker semitrailer fleet (480) exceeds economic useful life. Army investment strategy to replace 7.5K tankers begins in FY22 and the no current plan to replace the tractor before FY26.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
5	Joint Assault Bridge (JAB)	96*	96	$5.77M	$554M	The Joint Assault Bridge is a modified M1 tank platform replacement for the legacy Armored Vehicle Launched Bridge (AVLB) M60 tank chassis capability. Each of the Army Reserve's 16 Mobility Augmentation Companies are required 6 JABs for a total requirement of 96. Based on the projected procurement plan & fielding time horizon, the Army Reserve will begin fielding in FY22 with an anticipated completion in FY26. Of note, a pending Force Design Update will reduce the Army Reserve requirement to 36 JABs if approved.
6	Tracked Vehicle Maintenance Diagnostic Equipment	0	0	$1.1M	$6.6M	Require a modernized diagnostic capability to maintain Abrams & Bradley platforms. The Army Reserve currently has no current requirement. AR will begin fielding the Joint Assault Bridge (Abrams chassis), to its 16 Mobility Augmentation Companies in FY22. The Bradley is being considered as a bridging solution to replace legacy M113 systems resident in Army Reserve EAB Engineer units beginning in FY26. An authorization is essential to provide an organic capability to maintain both platforms without creating reliance on COMPO 1 or 2 facilities for maintenance support. The pending Combat Engineer Company - Armor (CEC-A) Force Design Update reduces the number of Army Reserve JAB & Bradley platform requirements, but does not address the diagnostic maintenance issue.
7	Common Bridge Transport (CBT) - M1977A4	504*	224	$370K	$67M	The CBT is the prime mover for mobility engineer bridging equipment used for spanning wet gap obstacles. The M1977A4 model replaces legacy vehicles that exceed economic useful life & provides an armor variant capable of global deployment to a non-permissive environment. Army Reserve will field 6 of 9 companies (56 systems each) by 4QFY20 with no additional procurements thru FY23.
8	Medical	3160*	1,420	Varies	$67M	In accordance with the Army Equipping and Modernization Strategy and Army Medicine Equipping Strategy, only 4 of the 16 248 bed Army Reserve Combat Support Hospitals are fully equipped. This equipping risk is mitigated through the maintenance of three Army Reserve Regional Training Sites - Medical that support multi-component and Joint collective training requirements. These sites require equipment upgrades to support on-going medical force design updates.
9	Mission Command Transport, Command Post & Enabler Systems	38,512*	12,328	Varies	$358M	The majority of the current budget shortfall is based on emerging command post & enabler systems. Incremental investments are needed to prevent an insurmountable funding challenge and widening network interoperability gaps. Failure to stay current will impact the ability to communicate, visualize the battle space, and synchronize the elements of combat power.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
10	All Terrain Crane Type II (Heavy)	75*	55	$1.5M	$82.5M	Army Reserve owns 35% of the total Army Construction Engineer force structure. The Heavy Crane will provide horizontal and vertical construction companies, route clearance companies, and multi role bridge companies with heavy lift and long reach capabilities needed to support the force. Army Reserve projects to have 20 on-hand by FY23.

* Quantities not limited to documented requirements; includes validated requirements captured in Basis of Issue Plan documents and Army Acquisition / Procurement Objectives.

Chapter 3
United States Marine Corps Reserve (USMCR)

I. Marine Corps Overview

The Marine Corps (USMC) is a warfighting organization. It exists to fight and to win. It remains the nation's most ready force.[1] The future operating environment will place heavy demands on the nation's naval Services, demands that the Marine Corps (USMC) is not currently organized, trained, equipped, or postured to meet. Modernizing the USMC for an era of great power competition will require significant adjustments to long-term Service investments, new integrated naval warfighting organizations and concepts of employment, and better training and education for Marines. The FY 2021 budget puts the USMC on the path toward modernization, supports irreversible implementation of the National Defense Strategy (NDS), and sustains and builds readiness to deter, fight, and win.[2]

> This necessary divestment and subsequent reinvestment process is a complex effort, and one that prudence dictates be conducted in the most thoughtful and analytically defensible manner possible. The strategic environment has changed significantly and that we are now in an era of great power competition mandates that we must make the necessary adjustments to our naval warfighting concepts and accompanying investment plans to create true readiness—operationally relevant and available naval forces that create and overmatch over anticipated adversaries. With peer competitors striving to supplant the role of U.S. military forces regionally and globally, we cannot afford to delay modernization when we see opportunities to make prudent adjustments from prior plans. To avoid being outpaced, agility in reprogramming becomes an essential tool to apply where it makes sense to do so.[3]

A. Marine Corps Planning Guidance

1. Strategic Concept of the Marine Corps

The USMC is optimizing its force structure for crisis response and forward presence.

> **The principal challenge facing the Marine Corps today lies in continuing to fulfill its role as the naval expeditionary force-in-readiness, while simultaneously modernizing the force in accordance with the NDS—and doing both within the fiscal resources provided.**[4] Marine forces must seamlessly integrate into and play a complementary role within a larger joint force. The USMC must strive to reduce duplication of warfighting capabilities; USMC contributions should largely be unique, complementary, and tailorable to the joint mission. Today's environment of renewed great power competition demands a truly integrated naval force. The imperative now to accelerate naval integration is driven not by historical example nor

[1] Commandant of the Marine Corps, *Statement before House Appropriations Committee Subcommittee on Defense*, March 4, 2020, p. 36–37.
[2] Ibid, p. 34.
[3] Ibid, p. 39–40.
[4] Commandant of the Marine Corps, The 38th Commandant's Intent, p. 1–2.

traditional bonds between the naval Services—it is driven by the global environment described in the National Security Strategy (NSS) and the NDS.[5]

2. Marine Corps Total Force Concept

The Active Component (AC) and Reserve Component (RC) are integrated as one Marine Corps—a Total Force Marine Corps. As an integral part of the Total Force, the USMCR plays a key role as a force multiplier, providing critical capabilities that increase the lethality of the Corps and contribute to the competitive advantage maintained over the nation's adversaries. Over the past year, the USMCR supported combatant commanders (CCDRs) providing support to combat operations, crisis prevention, crisis response, and theater security cooperation. Global deployments of the Reserve Force, along with participation in Service, Joint, and multinational exercises, deepen Reserve Force experience, ensuring the USMCR is relevant, ready, and responsive to meet CCDRs requirements.[6] Moving forward to FY 2022 and beyond, the active and reserve components of the USMC will adjust to the direction provided by the Commandant's Planning Guidance and Force Design implementation.

B. Marine Corps Equipping Policy

Marine Corps Systems Command (MARCORSYSCOM) acquires ground equipment for the RC in accordance with the Total Force Approved Acquisition Objective (AAO). The USMC develops the AAO for new equipment based on the approved capability requirement via the Joint Capabilities Integration and Development System process. The AAO is the quantity of an item authorized to equip and sustain the Service in accordance with current Department of Defense policies and plans. The USMC develops the Total Force AAO using an integrated system of dynamic processes that capitalize on operational experience to identify, define, and meet the emerging needs of Marine forces in support of the CCDR. This materiel management approach ensures that equipment sourced for the RC is consistent with the Service's equipping strategy and deployment schedule and the Commandant of the Marine Corps' guidance. In addition, it reduces latency in distribution and improves the visibility and transparency of the equipment distribution process. RC units remain interoperable with their AC counterparts because of the USMC's Total Force approach to equipment fielding and management. RC Forces are manned, trained, and equipped to standards that facilitate the seamless, integrated employment of forces to meet the CCDRs' requirements.[7]

C. Plan to Fill Equipment Shortages in the RC

Reserve units maintain equipment based upon the unit's Training Allowance (T/A), which is the portion of the unit's full Table of Equipment (T/E) kept for training at the Reserve Training Centers. This method maintains the necessary amount of equipment to train, maintain, and store the T/A within personnel and facility constraints. All equipment above the T/A (the difference between the T/A and the T/E) is stored at USMC Logistics Bases and other "in stores" locations.

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[5] Ibid, p. 40–41.
[6] Commander, Marine Forces Reserve, *Statement before the House Appropriations Committee Subcommittee on Defense Concerning Marine Corps Reserve,* March 3, 2020, p. 1–2.
[7] Ibid, p. 7.

The use of globally pre-positioned equipment brings RC units to full T/E equipping levels should the need arise. The USMC has used this methodology, known as "global sourcing," effectively to satisfy RC and AC unit equipment shortfalls in support of the RC filling the Infantry Battalion Unit Deployment Program (UDP) requirement for the UDP 19.1 and 20.1 rotations.

D. Initiatives Affecting RC Equipment

Equipment modernization and improved readiness are the key factors that allow the USMC to keep pace with future threats and preserve operational agility. Delays in investment funding have affected the USMC' modernization efforts as well as its ability to divest legacy equipment. The USMCRs' cost to maintain its legacy equipment has increased, adversely affecting unit training and overall readiness. Continued involvement by the RC in fielding conferences has a positive impact on the status of RC equipment. For example, fielding of the Joint Light Tactical Vehicle (JLTV) to the RC is scheduled to begin third quarter of FY 2021, earlier than the original anticipated start in FY 2023. However, the challenge of receiving the equipment concurrently with the AC counterparts continues to affect RC to AC equipment parity and readiness. Operational suitability should not be confused with availability; readiness must be more than a measure of availability. True readiness, which is defined as a unit's readiness to be deployed against a peer threat to achieve decisive tactical and operational outcomes, requires investment in modern capabilities commensurate with those of the threat.[8]

E. Plan to Achieve Full Compatibility between AC and RC

The USMC strives to achieve concurrent fielding of new ground equipment to the AC and RC to maintain common and interchangeable capability sets within the Total Force. The USMC Total Force fielding approach and push fulfillment sustainment policies contribute to RC units remaining interoperable with their AC counterparts. However, the USMCR needs more flexibility in assigning "mirror codes," given the size disparity and geographic distribution of units. USMCR Requirements Branch needs and has requested the ability to adjust "mirror codes" to balance unit requirements with total force integration. The request is being considered for implementation. For example, this will allow an RC Infantry Battalion to be "mirrored" to an AC Infantry Battalion without mirroring the RC Regimental Headquarters to allow for more robust T/E that facilitates vehicle and maintenance support to the distributed battalions and companies. Without the additional equipment at the Regimental level, the battalion and company will not have the necessary equipment for required training events.

Historically, the USMCR has leveraged National Guard and Reserve Equipment Appropriation (NGREA) to supplement funding deficiencies. NGREA has also improved efforts to achieve greater parity between the RC and AC. However, numerous programs are still fielded using a cascading vice concurrent fielding model, affecting the parity of RC to AC equipment. Most disconcerting is the RCs Individual Combat Clothing and Equipment (ICCE) deficiencies, specifically ballistic protection and load-bearing equipment. In the event of a large scale wartime

[8]Commandant of the Marine Corps, *Statement before House Appropriations Committee Subcommittee on Defense*, March 4, 2020, p. 38.

mobilization, to include any sizable call-up of the Individual Ready Reserve, ICCE deficiencies may become a strategic risk to mission.[9] Adjustments need to be made to all fielding models with consideration of the RC's actual operational commitments. Without concurrent fielding and RC equipment fielding prioritization on plane with AC prioritization, full compatibility between AC and RC equipment is not possible.

[9] Commander, Marine Forces Reserve, *Statement before the House Appropriations Committee Subcommittee on Defense Concerning Marine Corps Reserve,* March 3, 2020, p. 7.

II. Marine Corps Reserve Overview

A. Current Status of the Marine Corps Reserve

1. General Overview

Top RC Focus Areas

- Major Ground Equipment Modernization (JLTV, etc.)
- F-5N/F+ Block Upgrades
- Aviation and Ground Equipment Maintenance

The USMCR is an integral part of the Total Force. It is organized and trained to the same standards as its AC counterparts, facilitating the seamless employment of Reserve Forces to meet CCDR requirements. However, AC to RC equipment parity remains a challenge in key platforms. The USMCR provides critical capabilities to the Total Force, increasing the lethality of the Corps and contributing to the competitive advantage maintained over the nation's adversaries. The USMCR is relevant, ready, and responsive to the nation's call and CCDRs' requirements.

> On average in 2019, the Marine Corps Reserve provided approximately 11 percent of the Total Force's forward deployed forces for approximately 5 percent of the Marine Corps' budget. We continue to meet the increased demand for use as an operational reserve, though this has begun to challenge readiness to meet strategic requirements. Over the course of 2020, more than 8,000 Reserve Marines will support theater specific exercises, security cooperation events, and "standing" operations across every Combatant Command. These operations and exercises greatly increase the RCs interoperability with the AC, Joint Forces, U.S. allies, and coalition partners.[10]

The demand for Reserve Marines continues to grow. In 2019, the USMCR mobilized over 2,500 Reserve Marines supporting 45 operational requirements in each of the six geographic Combatant Commands. This represents a 19 percent increase in personnel deployed and a 22 percent increase in operational requirements compared to 2018. Additionally, more than 9,800 Reservists participated in 43 training exercises, supporting 21 countries across the globe, and filled 59 percent of the total service individual augment requirements. Participating in these operations and training exercises greatly increases the RCs' interoperability with the AC, Joint Forces, allies, and coalition partners. The USMCR will continue to meet the increased demand for use as an operational reserve, though this employment has begun to challenge readiness to meet strategic requirements.[11]

The top procurement priority for the USMCR involves the transition to the JLTV. The AC began receiving the JLTV in 3rd Quarter of FY 2019, but the RC will not receive its first shipment until 3rd Quarter of FY 2021. Because JLTV fielding to RC units was delayed, the RC will continue to operate the legacy high mobility multipurpose wheeled vehicle (HMMWV) during exercises and operational training.

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[10] Commander, Marine Forces Reserve, *Statement before House Appropriations Committee Subcommittee on Defense Concerning Marine Corps Reserve*, March 4, 2020, p. 2.
[11] Ibid, pg. 2.

Modernization efforts include block upgrades for the F-5N/F adversary aircraft and procurement of meteorological equipment that will add capability and increase safety and unit readiness. The transition from the AH-1W attack helicopter to the AH-1Z platform was completed in FY 2020 and the F/A 18A++ aircraft are transitioning to the updated F/A 18C+ modification with anticipated completion in FY 2023. For ground vehicles, transition to the Amphibious Combat Vehicle (ACV) will begin as the program reaches full-rate production. Lastly, the AC is currently seeking to replace the equipment sets for the Low Altitude Air Defense (LAAD) Battalions and an RC LAAD Battery, which is scheduled to come online in FY 2025.

2. Status of Equipment

The unique geographic dispersion of USMCR units, coupled with a limited number of full-time personnel and limited storage capacity, make the proper accountability of equipment and validation of the T/A essential to maintaining overall readiness. By continually refining the T/A, MARFORRES's goal is to balance the amount of equipment necessary to conduct training with the amount of equipment that can be maintained within personnel, facility, and fiscal constraints. Additionally, the use of Overseas Contingency Operations (OCO)–funded USMC Logistics Command mobile maintenance support teams that travel to Reserve Training Centers and augment the limited organic maintenance capacity has been very successful and has received Congressional support in the past. Continued support for this capability with OCO is central to MARFORRES's continued success in sustaining equipment and maintenance readiness. MARFORRES is critically deficient in the ICCE. The FY 2020 Unfunded Priority List included $69 million to address this deficiency, which was approved for funding, but the funding was subsequently reprogrammed to support other priorities. The slow procurement and fielding of the updated/modernized ICCE requires MARFORRES to maintain legacy equipment, causing the bulk of the ICCE shortfall. The legacy ICCE equipment is increasingly non-deployable, increasing RC and AC cost to support the ICCE requirements for global force management obligations. Additionally, the sustainment capability has historically been limited because the equipment is not available for procurement with baseline funds through Global Combat Support System–Marine Corps (GCSS-MC). However, the shortfall has been decreasing because updated equipment was fielded in the third quarter of FY 2020. MARFORRES was able to procure $22 million in ICCE using unobligated funds because of the COVID-19 shut down, with delivery expected late in FY 2021. With the exception of legacy equipment, the RC maintains equipment to the same standards as the AC, which facilitates a seamless employment in support of CCDRs. The ICCE shortfall is being addressed by including MARFORRES in the USMC Enterprise Consolidated Storage Program (CSP), as reviewed and approved by a Headquarters USMC Deputy Commandant for Installations and Logistics Marine Requirements Oversight Council (MROC) study. The study shows inclusion in the CSP provides significant sustainment cost savings/avoidance and improves inventory access and visibility over the current process.

a. Equipment On-hand (EOH)

The MARFORRES EOH consists of the T/A which is the minimum amount of equipment required to train to Core Mission Essential Tasks at the Reserve Training Centers. Currently, the functionality to display and track T/A is not in an Accountable Property System of Record

(APSR). MARFORRES is working with Deputy Commandant for Installations & Logistics (DC I&L), Combat Development & Integration, Marine Corps Logistics Command, and the respective program offices to make the required system changes to add the T/A to the Total Force Structure Management System (TFSMS) update. This change is critical to accomplishing the Commandant's Planning Guidance task to invest in modernization by divesting of legacy equipment. Adding the T/A to TFSMS will increase EOH transparency and visibility, improving allowance, inventory management, and unit readiness. Based on other system changes and funding shortfalls, the system changes have been delayed. A change request was submitted to the GCSS-MC to add the T/A data field as an interim solution. This change request was approved and is pending implementation, but was delayed because of a change in the contracted servicing company. By storing the T/E delta (the equipment that MARFORRES does not need for training, or have adequate resources to store and maintain) at USMC Logistics Bases and other "in stores" locations, MARFORRES maintains a high EOH posture for mission essential equipment.

Table 1 Consolidated Major Item Inventory and Requirements reflects the combined projected equipment inventories and requirements of USMCR units for FY 2022 through FY 2024. These quantities are an aggregate of the EOH and equipment maintained by USMC Logistics Command. Marine Forces Reserve mission essential equipment readiness levels are sufficient and capable of supporting all home station training requirements as well as current operational deployments. Congressional support for the FY 2022 President's budget request and continued support of appropriate OCO funds is essential to the USMCR's ability to maintain the readiness of multiple legacy equipment platforms that have been critical to supporting ongoing operations.

b. Average Age of Major Items of Equipment

The equipment listed in *Table 2 Average Age of Equipment* provides the average age of selected major equipment items at the start of FY 2021. The average age of RC equipment is currently consistent with the age of equipment in the AC except for legacy equipment such as the KC-130T, F/A-18 A++, and Assault Amphibious Vehicle. Maintaining legacy equipment is challenging because it is approaching the end of its lifecycle and lacks supply parts. These legacy systems are either in upgrade or modification programs to extend the lifecycle of the equipment or have fielding of replacement equipment planned. For example, the F/A-18A++ is being replaced/upgraded to the F/A-18C+, with scheduled completion in FY 2023, and the KC-130T is being replaced by the KC-130J via the future years defense program (FYDP).

c. Compatibility of Current Equipment with AC

The RC remains near parity with its AC counterpart because of the Total Force approach to equipment fielding. However, the fiscal unpredictability of the past several years and the continued reality of ongoing budgetary uncertainty disrupts the USMCR's ability to program long-term activities and challenges its efforts to improve current and future readiness. To continue to meet operational commitments and maintain a ready force, the USMC requires greater fiscal stability and continued congressional support. Fielding new equipment is improving the support and sustainment of ICCE in the RC. DC I&L conducted an MROC study regarding the addition of MARFORRES to the USMC Enterprise CSP. This review determined it was fiscally advantageous for MARFORRES to be included and to move forward with inclusion.

This change would have a significant and positive impact on ICCE availability and parity compared to the AC. Given the nature of the current manufacturing and logistics environments, this change would facilitate current ICCE for RC Marines before they depart to support CCDR requirements.

d. Maintenance Challenges

Several factors continue to affect maintenance efforts and priorities across the RC. These include limited personnel resources to identify and conduct maintenance; limited fiscal resources; and increased operational tempo (mobilizations and exercises). RC units are limited to the small full-time support staffs at each Reserve Training Center, which are augmented by Reserve Marines during the monthly drill and 2-week annual training period. The AC maintenance personnel, in many cases, do not possess the knowledge and experience necessary for independent duty assignment at Reserve Training Centers. This experience shortfall results in decreased maintenance readiness and inefficient performance of ground equipment maintenance.

The limited fiscal resources and limited staffing focus maintenance efforts on corrective maintenance for Mission Essential Equipment. This focus constrains routine preventative and corrective maintenance on the remaining equipment, further exasperating the maintenance challenges within the RC. Additionally, without a corresponding increase to authorizations, the increasing cost of Secondary Repairable parts compounds the maintenance challenges annually.

In recent years, the USMC's demand for unique capabilities has increased, requiring more RC activations of units and ad-hoc formations. This increased employment of RC forces has generated excessive wear on combat equipment. Consequently, requirements for maintenance, the exponential increase in secondary reparable cost, and the need to replenish gear have out-paced previous forecasts. The cost increase in repair and replacement parts without an increase in budget adversely affects the maintenance readiness of the RC ground equipment on hand. Additionally, the Government Accountability Office (GAO) found the USMC needs to implement its masterwork schedule into the baseline work schedule to facilitate performance assessments against the planned maintenance work.[12] Finally, aviation readiness challenges across the USMC enterprise, caused by a combination of aging aircraft, maintenance backlogs, and unresponsive supply chains, have affected MARFORRES aviation units. The result is a mission capable status of 50 percent for 4th Marine Aircraft Wing flight line aircraft.

e. Modernization Programs and Shortfalls

USMC modernization programs are designed to keep pace with the changing requirements of current and future operations. The RC uses various funding sources such as the baseline procurement budget and NGREA to execute these programs and fill equipment shortfalls for both aviation and ground forces.

- Aviation Modernization: The RC is included in the USMC Aviation Plan. During the current FYDP and out years planning profile, the RC squadrons will continue the transition to

[12] GAO-20-401, *Army and Marine Corps Need to Improve Efforts to Address Challenges in Measuring Performance and Planning Maintenance Work*

several new aircraft platforms (KC-130J, F/A-18C+, and AH-1Z). The RC has historically used NGREA funding to procure aviation-training simulators to facilitate the transition to the new aircraft (for example the KC-130J fuselage trainer).

- Combat Equipment Modernization: The USMC is acquiring major ground equipment modernizations that will provide the RC with the latest generation of warfighting capabilities. This includes fielding of the JLTV beginning in FY 2021.

f. Overall Equipment Readiness

Equipment readiness for RC units remains consistent with AC readiness reporting levels. The RC continues to maintain its T/A in a high state of operational readiness. Aviation readiness in the RC faces similar challenges as the AC and is consistent with readiness levels across the USMC enterprise.

B. Changes since the FY20 NGRER

Several major changes since the previous NGRER have had a significant impact on the RC achieving interoperability with the AC. The Mobile Integrated Remains Collection System (MIRCS) became a USMC Program of Record for procurement and was procured with FY 2019 NGREA. The RC anticipates delivery of nine MIRCS in FY 2021 with an additional three systems to be purchased in the out years. Additionally, after internal realignment of funds, 4th Marine Aircraft Wing was able to purchase the white phosphor image enhancer upgrade for night vision goggles as well as the Marine Air Ground Tablet. Force Design adjusted USMCR equipment priorities to posture the RC to augment, support, and reinforce the AC.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2022 Equipment Requirements

The USMC will continue to pursue current and emerging ground and aviation equipment requirements in order to modernize the Total Force. During this effort, the RC will strive to maintain equipment parity with its AC counterparts to the maximum extent possible.

2. Anticipated New Equipment Procurements

a. JLTV

The number one procurement priority for the USMCR is the JLTV, a joint Army/USMC program to procure the next generation of light tactical vehicles and companion trailers. The program's objectives are to improve the mobility and payload of the light tactical vehicle fleet while providing increased survivability through modular protection within the weight constraints of the expeditionary force. JLTVs are configured to support multiple mission packages, derived from two base vehicle configurations, the four-door Combat Tactical Vehicle and two-door Combat Support Vehicle. The commonality of components, maintenance procedures, and

training among all vehicle configurations minimize total ownership costs. This program minimizes maintenance costs through increased reliability and provides improved fuel efficiency over the current light tactical vehicle. The vehicle design uses scalable armor solutions to increase warfighter protection and restores payload capabilities lost due to the armoring of the HMMWV fleet. Full rate production and fielding began in August 2019 with Full Operational Capability occuring in FY 2021. The USMC plans to procure 15,235 JLTVs. The RC is slated to begin receiving its allocatioin of 2,053 JLTVs in 3rd quarter FY 2021. The RC is projected to receive 157 by the end of FY 2022. Modernizing from the HMMWV to the JLTV will reduce the maintenance burden on the RC that results from the aging fleet of HMMWV currently in operation. Currently, the RC is scheduled to receive 335 JLTVs (or 6 percent) of the total requirement through the FYDP. Table 1 will be updated to reflect the allowance for the JLTV once the AAO transitions out of "planned allowance." The RC needs its full T/E to be procured and fielded to support the training and war time requirement for light tactical vehicles. Pending final decision on the Commandant's Planning Guidance (CPG) and Force Design, the final requirement for the RC may be adjusted. The new RC Low Altitude Air Defense equipment set may introduce more JLTVs to the RC once the final capability is selected and sourced.

b. F-5 N/F+ Block Upgrade

Updating and modernizing the adversary aircraft fleet provides increased flight safety and tactical capability, facilitating effective training for 4th generation and the increasing number of 5th generation fighters while maintaining a low operation cost. The upgrades are necessary to ensure the USMC fleet is interoperable with the Navy Reserve (USNR). The FY 2020 budget provided the purchase of 22 from the Swiss. This purchase directs 12 aircraft to the USMCR and each will be upgraded on delivery. The RC is anticipating to receive one F-5N and one F-5F in FY 2022 and FY 2023 as well as three F-5Ns and one F-5F in FY 2024. A mixed fleet of aircraft creates a disparity in training, cockpit familiarity, safety, and in some cases system operation. Upgrading the existing aircraft in the USMC fleet is necessary for increasing safety and equipment parity across the adversary fleet. The Swiss aircraft being added to the inventory allows for the expansion of the squadron to include a detachment of adversary aircraft in Beaufort, SC. Additionally, the FY 2020 budget includes funding for the purchase of a simulator. This simulator is intended to be placed with VMFT-401

in Yuma, AZ, reducing travel and training cost for new and current personnel by minimizing or eliminating the requirement for travel to Falon, NV, to use the USNR simulator.

c. Meteorological Mobile Facility (Replacement) (METMF(R)) Next Generation (V)2

The METMF(R) NEXGEN (V)2 Intelligence Battalion Variant is a modular, man-portable system that provides limited functions of environmental sensing and data ingest and does not contain the vehicle, the shelter itself, or the trailer. The METMF(R) NEXGEN enables the Marine Meteorological and Oceanographic (METOC) analyst to effectively turn relevant METOC data into actionable knowledge, which can facilitate timely operational decision-making. The METMF(R) NEXGEN is the only organic USMC METOC system and has been fielded to the AC. While the RC has an allowance for the equipment, it has not been fielded to meet the requirement of one system. The METMF(R) NEXGEN is capable of sustained operations with or without network connectivity, providing critical METOC data in direct support of all elements of the Marine Air/Ground Task Force (MAGTF). The METMF(R) NEXGEN delivers relevant, timely METOC sensing, operational products, and mission-oriented impact assessments via the Common Operating Picture/Common Intelligence Picture to the MAGTF and the Joint Force. This equipment set was on the proposed FY 2020 NGREA buy list, but was not purchased as budget reprogramming funded other priorities.

d. Naval Integrated Tactical Environmental System (Nites-Next)

The AN/UMQ-4 (V)4 NITES-Next is a mobile and tactical METOC system that operates connected to shipboard and shore networks to collect, fuse, analyze, and disseminate METOC information in support of MAGTF operations. NITES-Next is employed by METOC Support Teams throughout the MAGTF to provide critical METOC information to operating forces conducting missions in remote locations and harsh environments. NITES-Next is portable, lightweight, rugged, and scalable, allowing mission requirements, network availability, and embarkation space to dictate how best to employ the system. NITES-Next consists of a processing suite, a standalone sensor suite, and a Broadband Global Area Network Inmarsat suite. MARFORRES has a total requirement of five INMARSAT, ten Processing Suites, and ten Sensor Suites. MARFORRES is deficient the entire total requirement with no scheduled fielding. This equipment set was on the proposed FY 2020 NGREA buy list, but was not purchased as budget reprogramming funded other priorities.

3. Anticipated New Equipment Requirements

a. ACV

The USMC established the ACV program as a way to acquire an enhanced capability to transport Marines from ship to shore under hostile conditions. At present, the USMC uses the AAV-7A1 series amphibious assault vehicle to move Marines from ship to shore. The USMC has used the amphibious assault vehicle (AAV) since 1971 and expects to continue to use it until replaced by the ACV. As part of a service initiative to minimize the maintenance challenges associated with the age of equipment, a portion of the USMC's existing AAV fleet will go through depot level maintenance to extend the vehicles' service lifecycle to FY 2035. However, no RC vehicles are scheduled to receive these depot level upgrades. The ACV Programs acquisition approach consists of two increments. Increment 1 will field a personnel carrier (ACV-P) with "ship-to-shore" capability. Increment 2 will enhance the personnel carrier capabilities over Increment 1, increase the number of battalions of lift by procuring more vehicles, and deliver the ACV-C, ACV-R, and ACV-30 Mission Role Variants (MRVs) derived from the ACV-P base vehicle platform. The ACV-C will serve as a tactical-echelon command post for the regiment or battalion. The ACV-C provides the embarked commander with the platform to command and control the battlefield from under armor. The ACV-R is an armored amphibious wheeled vehicle that provides field maintenance, recovery, and limited repair capabilities to the assault amphibian (AA) battalion. The ACV-R is organic to the AA company and battalion, as well as the maintenance battalion of the Marine Logistics Group. The ACV-30 carries a medium caliber weapon system capable of supporting dismounted maneuver while still embarking Marines. Each MRV will have its own initial operating capability (IOC). IOC for the ACV-P is planned to occur in FY 2020 with USMC slated to receive 30 ACV-P Variants. IOC for the ACV-C is planned to occur in the 4th Quarter of FY 2024 with USMCR slated to receive 30 vehicles. IOC for the ACV-30 is planned to occur in the 4th Quarter of FY 2025 with USMCR scheduled to receive 12 vehicles. IOC for the ACV-R is planned to occur in the 4th Quarter of FY 2026 with USMCR scheduled to receive five vehicles. ACV full operational capability quantities will be determined pending final decision on Force Design.

b. Tactical Decision Kit (TDK)

The TDK uses technology that allows Marines and Sailors to train virtually on or off duty and test their decision-making skills. Marines use computing and virtual reality hardware to enhance rapid decision making, employ a competitive training environment that was not previously available, and provide hands-on force-on-force training to allow them to operate against a thinking enemy and improve tactical decisiveness in any environment. The TDK includes augmented reality, virtual battle space 3 (VBS3), and interactive tactical decision game 5 (ITDG 5) capabilities. Augmented reality allows Marines to visualize a variety of terrain to aid in their mission planning and real-time decision-making skills. The virtual battle space is a first-person shooter simulation from the viewpoint of the player that places the Marine in squad- and platoon-level force-on-force scenarios. VBS3 requires Marines to think tactically, make decisions, and communicate with subordinates and adjacent units in a complex, competitive environment using a range of supporting assets. Finally, the ITDG 5 system allows users to create and execute in-depth, customizable tactical decision games that show second- and third-order effects of decisions. This enhances Marines' abilities to create after-action reports, debriefs, and digital sand table exercises, among other uses. With the TDK, Marines use tools such as drones to perform reconnaissance of the virtual battlespace and gather imagery data they can transform into a terrain model. They view the model using a 3D virtual reality headset and develop the warfighting plan within this environment. Once the plan is formulated and briefed, Marines rehearse the execution of the plan using the networked Deployable Virtual Training Environment software from MARCORSYSCOM's Training Systems. They can virtually fight each other or on teams against enemy forces using different scenarios and environments.

4. Anticipated Transfers from AC to RC

The infantry battalion equipment set that was transferred from 4th MARDIV to 1st MARDIV to support UDP 20.1 has been returned to the USMCR. No additional transfers are expected.

5. Anticipated Withdrawals from RC Inventory

The last KC-130T aircraft are scheduled to be removed from the RC inventory by April 2021 as part of the transition to the KC-130J. Furthermore, as the RC continues the transition to the F/A-18C+ aircraft, additional F/A-18A++ aircraft will be removed from the inventory as part of the platform "sundown" plan. The transition is expected to be complete in FY 2023. The HMMWV phase out will begin as JLTV fielding begins in 3rd quarter FY 2021. The USMCR anticipates receiving 157 JLTVs and divesting 157 HMMWVs by the end of FY 2022.

6. Equipment Shortages and Modernization Shortfalls at the End of FY 2023

The RC wartime requirements are addressed in *Table 1 Consolidated Major Item Inventory and Requirements*, which delineates the major item shortfalls that are anticipated to exist at the end of FY 2023. *Table 8 Significant Major Item Shortages* presents the RC's highest priority unfunded equipment and modernization shortfalls affecting Reserve unit training allowances.

D. Summary

As stated by the Commandant of the Marine Corps in the Commandant's Intent, "The principal challenge facing the Marine Corps today lies in continuing to fulfill our role as the naval expeditionary force-in-readiness, while simultaneously modernizing the force in accordance with the NDS—and doing both within the fiscal resources provided."[13] Concurrent fielding efforts and RC participation in the fielding conferences is having a positive impact on the status of RC equipment. However, the challenge of receiving the equipment concurrently with the AC counterparts continues to affect the RC to AC equipment parity; key examples for this challenge are the JLTV and ICCE fielding. Unless the Total Force is fielded concurrently and RC equipment fielding prioritization matches AC prioritization, full compatibility between AC and RC equipment is not possible.

Equipment accountability and readiness within the RC T/A continues to be a challenge. The T/A residing in an APSR will improve inventory management and unit readiness by increasing equipment visibility and providing a transparent picture of EOH compared to an APSR T/A. This action will also help accomplish the CPG task to invest in modernization by divesting of legacy equipment. Further, adding MARFORRES to the USMC Enterprise CSP for ICCE support provides increased visibility of enterprise inventory, improved fielding efficiency, and significant cost savings over the current management process. Recent fiscal unpredictability and ongoing budgetary uncertainty disrupts its ability to program long-term activities and challenges its efforts to improve current and future readiness. Limited fiscal resources generate a maintenance program focused on Mission Essential Equipment (MEE) and constrains routine preventative and corrective maintenance for non-MEE, further exasperating maintenance challenges within the RC.

Recent congressional adds improved the fielding plans for key equipment, decreased fielding timelines, and increased RC to AC equipment parity. Additionally, the improvements align with the Commandants Guidance and intent to modernize the Force by investing in modern equipment by divesting of legacy equipment. Pending anticipated CPG task and Force Design decisions, additional fidelity and clarity on the equipment challenges in the RC will be available.

[13] Commandant of the Marine Corps, The 38th Commandant's Intent, p. 1.

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Table 1

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2021 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Aircraft							
Aircraft, Fighter/Attack, F/A-18A++	F/A-18A++	$36,100,000	15	15	15	15	15
Aircraft, Fighter/Attack, F/A-18C+	F/A-18C+	$38,500,000	12	14	14	14	14
Aircraft, Fighter, F-5F	F-5F	$19,100,000	1	1	1	1	1
Aircraft, Fighter, F-5N	F-5N	$5,000,000	11	11	11	11	11
Aircraft, Refueling/Cargo, KC-130J	KC-130J	$92,152,561	14	16	16	20	28
Aircraft, Utility/Cargo, UC-12W	UC-12W	$15,500,000	2	2	2	2	2
Aircraft, Utility/Cargo, UC-35C	UC-35C	$33,500,000	2	2	2	2	2
Aircraft, Utility/Cargo, UC-35D	UC-35D	$33,500,000	4	4	4	4	4
Helicopter, Attack AH-1Z	AH-1Z	$30,450,000	0	26	26	26	26
Helicopter, Utility, UH-1Y	UH-1Y	$25,240,000	22	22	22	22	22
Helicopter, Cargo, CH-53E	CH-53E	$56,900,000	8	8	8	8	8
Tilt-rotor, Cargo, MV-22B	MV-22B	$104,027,000	24	24	24	24	24
RQ-21A Blackjack System	RQ-21A	$12,789,000	2	2	2	2	2
Flight Training Device, KC-130J Weapons System Trainer (WST)	KC-130J FTD (WST)	$33,267,089	1	1	1	1	1
Fuselage Trainer, KC-130J	KC-130J FUT	$17,078,182	0	1	1	1	1
Cockpit Procedures Trainer, KC-130J	KC-130J CPT	$4,937,258	1	1	1	1	1
Observer Training Aid, KC-130J	KC-130J OTA	$3,278,150	1	1	1	1	1
Aircrew Procedures Trainer, AH-1W	AH-1W APT	$4,500,000	1	1	1	1	1
Flight Training Device, UH-1Y	UH-1Y FTD	$16,400,000	2	2	2	2	2
Flight Training Device, CH-53E	CH-53E FTD	$10,611,000	1	1	1	1	1
Containerized Flight Training Device, MV-22B	MV-22B CFTD	$9,239,000	2	2	2	2	2
Communications & Electronics							
TRSS Day/Night Imager, V2 (IMAGER 2)	A0003	$24,373	102	102	102	102	102
Theater Battle Management Core Systems	A0013	$342,866	2	2	2	2	2
Comm Data Link System (CDLS)	A0021	$324,501	2	2	2	2	2
Communications Sub-System	A0032	$1,325,179	16	16	16	16	16
Digital Terrain Analysis Mapping System Light	A0059	$10,556	3	3	4	4	4
High Frequency Vehicle System	A0067	$53,234	152	152	207	207	207
Video Scout Remote Video Exploitation Terminal (RVET)	A0091	$87,400	76	76	76	76	114

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Hub Modem Package (HMP)	A0136	$107,297	1	1	1	1	3
Radio Set	A0139	$47,828	71	71	111	111	111
Radio Set	A0153	$224,839	38	38	63	63	63
Power Module	A0172	$5,165	27	27	27	27	27
Comm Security Module (CSM)	A0173	$44,550	79	79	79	89	79
LAN Service Module (LSM)	A0174	$92,330	79	79	79	89	79
Computer Digital Data Transfer	A0175	$2,615	118	118	118	114	118
LAN Extension Module	A0176	$27,930	369	369	369	353	369
Application Server Module (ASM)	A0177	$14,980	93	93	93	89	93
Data Processing Module	A0183	$16,375	26	26	26	26	71
CIHEP Commercial SATCOM Set (CSCS)	A0188	$21,032	22	22	22	22	64
Vehicle Accessory Module	A0193	$2,164	19	19	19	19	18
Common Geoint Workstation-R (CGW-R)	A0221	$28,491	0	0	0	34	34
Very Small Aperture Terminal - Small (VSAT-S)	A0234	$80,000	21	21	32	32	32
Very Small Aperture Terminal - Medium (VSAT-M)	A0241	$90,000	11	11	13	13	13
Very Small Aperture Terminal - Large (VSAT-L)	A0242	$295,000	14	14	26	26	26
VSAT Master Reference Terminal (MRT)	A0244	$105,000	7	7	13	13	13
Combat Operations Center (COC) V(3)	A0254	$1,698,000	8	8	8	8	0
Combat Operations Center (COC) V(4)	A0255	$1,220,000	19	19	19	19	0
Enterprise Switch Module (ESM)	A0269	$159,400	8	8	8	8	15
Tactical Exploitation Group Remote Workstation (TEG-RWS)	A0274	$52,000	7	7	7	7	30
Wan Service Module (WSM) (V)1	A0276	$75,470	0	0	1	3	12
Wireless Point To Point Link (WPPL) T	A0278	$100,000	11	11	11	11	60
Information Assurance Module (IAM) DDS-M	A0304	$50,000	29	29	29	29	25
WAN Services Module (WSM) V2	A0312	$41,850	163	163	163	1	163
SCA Multiband Networking Radio	A0336	$28,908	564	564	564	564	713
SCA Multiband Networking Vehicular Radio System - Single Mount (RF-300M-V150)	A0352	$17,900	103	103	103	103	319
SMG-L	A0358	$72,527	6	6	6	6	9
Group 3 UAS, Black Jack	A0362	$7,118,553	2	2	2	2	2
VSAT E	A0364	$190,000	4	4	4	4	6
Sensitive Compartmentalized Information Kit (SCIK)	A0366	$191,000	0	0	0	0	1
Mapping System, Terrain Analysis, Digital (DTAMS)	A0504	$90,748	5	5	5	5	10
Intelligence/Operations Workstation	A0932	$2,810	165	165	165	109	165
Hand-Held, Programmer Monitor (HHPM)	A1221	$15,000	12	12	12	12	54
Radar Set, Firefinder	A1440	$4,800,000	4	4	5	165	5
Radar Set	A1503	$15,217,555	1	1	2	5	0
Radio Set	A1957	$43,986	184	184	184	2	281
Radio Set, Multiband (Maritime)	A2044	$7,431	204	204	204	184	558
Terminal, Radio, Troposcatter, Digital	A2179	$1,500,000	16	16	28	204	28
TRSS Radio Repeater Set	A2300	$22,687	70	70	96	28	96
Advanced Field Artillery Tactical Data System	A2555	$2,844	147	147	163	96	163
Tracking Network, Composite (CTN)	A2600	$1,667,000	2	2	2	2	2
Tactical SATCOM, Transportable (SMART-T)	A3232	$825,000	6	6	6	163	9

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Sensor, Ground, Unattended	A3255	$867,264	6	6	6	6	6
Interrogator Computer	A8018	$1,499	4	4	4	4	11
Transponder Computer	A8019	$1,254	4	4	4	4	9
Engineer							
Air Conditioner, Horizontal, 1.5-ton, 60Hz, 18K Btu	B0003	$10,021	26	26	7		7
Air Conditioner, 5-ton, 60K; R-22	B0008	$20,251	62	62	86	7	86
Environmental Control Unit, Horizontal, 36K Btu; R-22	B0014	$15,092	184	184	273	86	273
Distribution System, Mobile Elect PWR, 5kW (Indoor)	B0027	$4,500	295	295	246	273	246
Distribution System, Mobile Elect PWR, 5kW (Outdoor)	B0028	$7,500	398	398	343	246	343
Distribution System, Mobile Elect PWR, 15kW	B0029	$8,800	166	166	197	343	197
Distribution System, Mobile Elect PWR, 30kW	B0030	$16,100	161	161	143	197	143
Distribution System, Mobile Elect PWR, 100kW	B0031	$28,500	90	90	80	143	80
Distribution System, Mobile Elect PWR, 300kW	B0032	$22,100	14	14	23	80	23
All Terrain Crane (ATC) Mac-50	B0038	$578,000	23	23	26	23	26
B0043	B0039	$450,000	3	3	7	26	7
Generator Set, 15 KW, 60 HZ, AMMPS, SKID-mounted	B0043	$20,949	72	72	72	72	182
Medium Crawler Tractor (John Deer)	B0060	$325,000	56	56	56	7	34
Tractor, Rubber Tire, Articulated Steering, Mp	B0063	$198,708	117	117	106	56	69
Light Weight Water Purification System	B0071	$194,580	44	44	53	106	53
Air Conditioner, MCS Horizontal, 60Hz, 9K Btu; R-22	B0074	$9,510	19	19	17	53	17
Generator Set, 5KW, 60HZ, AMMPS, Skid-mounted	B0077	$19,878	86	86	86	86	91
Grader, Road, Motorized	B0078	$236,008	21	21	21	17	14
Low Metallic Signature Mine Detector	B0102	$23,976	150	150	180	21	162
Light Weight Carbon Rod Detector	B0105	$3,886	143	143	143	143	414
Excavator, Hydraulic (HYEX)	B0119	$242,636	6	6	6	6	12
Container Handler, RT, Kalmar	B0392	$525,000	9	8	8	8	8
M9 Armored Combat Earthmover	B0589	$1,000,000	20	20	20	20	20
Tactical Airfield Fuel Dispensing System (TAFDS) (Firestone)	B0675	$331,062	10	10	9	9	9
Amphibious Assault Fuel System (AAFS)	B0685	$1,238,680	4	4	4	4	9
Generator Set, 3kW, 60Hz, Skid-mtd	B0730	$9,922	194	194	194	194	182
Generator Set, Skid Mtd, 10kW/60Hz, TQD	B0891	$19,912	130	130	130	130	229
Generator Set, SKID MTD, 10kW/400HZ, TQG	B0921	$15,304	10	10	10	10	5
Generator Set, Skid Mtd, 30kW/60Hz, TQD	B0953	$22,046	142	142	284	284	284
Generator Set, 60KW, 400HZ, AMMPS, SKID-MTD	B1016	$34,000	4	4	4	4	12
Generator Set, Skid-mtd, 60kW/60Hz, TQD	B1021	$26,956	171	171	211	211	211
Generator Set, 100kW, 60Hz, Skid-mtd, TQD	B1045	$67,000	58	58	50	50	50
Refueling System, Expedient, Helo	B1135	$101,863	6	6	9	9	9
Pump Module, Fuel (SIXCON)	B1580	$23,350	82	82	135	135	135
Roller, Compactor, Vibratory, Self-Propelled	B1785	$63,000	8	8	10	10	8
Scraper-Tractor, Wheeled	B1922	$708,597	9	9	9	9	20
Storage Tank Module, Fuel (SIXCON)	B2085	$6,948	385	385	432	432	399
Storage Tank Module, Water (SIXCON)	B2086	$5,524	120	120	120	120	293

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Sweeper, Rotary, Vehicle Mounting	B2127	$215,781	6	6	6	6	6
Loader, Backhoe (BHL)	B2483	$83,359	28	28	34	34	34
Truck, Forklift, Variable Reach	B2561	$99,245	72	72	67	67	67
Forklift, RT, Lt Capability (LRTF)	B2566	$74,750	91	91	91	91	89
Purification System, Water, Tactical	B2605	$350,000	20	21	21	21	21
20K Tank Assembly, Water, Fabric, Collapsible	B2632	$6,837	21	21	21	21	30
General Supply							
Expeditionary Field Kitchen	C0034	$419,830	12	12	12	12	20
MAGTF CBRN Dismounted Reconnaissance Set, Kit, Or Outfit (Dr Sko)	C0069	$1,630,000	2	2	2	2	2
Escalation of Force-Mission Modules (EOF-MM)	C0104	$422,000	7	8	9	9	9
Raiding Craft, Combat, Rubber, Inflatable (CRRC)	C5901	$10,500	47	47	86	86	86
Tandem Offset Resupply Delivery System (TORDS)	C6375	$18,736	10	10	10	10	10
Motor Transport							
Equipment Transporter, Semi-Trlr, Lowbed, 50T	D0002	$105,308	2	2	2	2	5
Truck, Armored, Cargo 7-ton, W/O Winch Reducible	D0003	$1,038,258	467	467	467	467	445
Truck, Armored, XLWB, W/O Winch Reducible	D0005	$967,505	31	31	42	42	38
Truck, Armored, Dump 7-ton W/O Winch Reducible	D0007	$909,255	33	33	40	40	45
Truck, RTAA, Tractor, 7-ton, W/O Winch	D0009	$553,981	28	28	20	20	20
Truck, Armored, Tractor, 7-ton, W/O Winch, Reducible	D0013	$991,148	38	38	44	44	44
Truck, Armored, Wrecker, 7-ton, W/Winch Non-Reducible	D0015	$941,695	49	49	53	53	50
Trailer, Palletized Loading System	D0035	$96,063	73	73	73	73	90
P-19R Airfield Rescue and Fire Fighting Vehicle	D0041	$1,030,850	18	18	18	18	18
LVSR, Armored Cargo Variant6	D0052	$1,403,789	6	6	6	6	44
LVSR, Armored Tractor Variant	D0053	$1,275,336	2	2	2	2	7
LVSR, Armored Wrecker Variant	D0054	$1,622,517	3	3	3	4	4
Armored Semi-Trlr, Refueler, 5,000 Gal	D0055	$386,909	0	0	0	0	13
Truck, RTAA, Cargo, 7-ton, W/O Winch	D0198	$449,613	670	670	465	465	443
Flatrack Refueling Capability (FRC)	D0211	$224,966	26	26	26	26	51
Semitrailer, Refueler, 5,000 gal	D0215	$397,355	18	18	18	18	51
Semitrailer, Lowbed, 40-ton	D0235	$102,094	43	43	43	43	59
Trailer, Cargo, Resupply for HIMARS	D0861	$91,922	18	18	18	18	36
Trailer, Tank, Water, 400 GAL, 1 1/2T, 2-WHL	D0880	$20,954	160	160	160	160	221
Truck Cargo 22.5-ton, 10X10, (LVSR)	D0886	$1,160,477	184	184	218	218	146
Truck, Tractor, 10X10 (LVSR)	D0887	$1,045,775	43	43	58	58	56
Truck, Ambulance, 4-Litter, Armored, 2 1/4-ton, HMMWV	D1001	$107,323	66	66	85	85	80
Truck, Ambulance, 2-Litter, Soft Top, 2 1/4-ton, HMMWV	D1002	$61,521	27	27	36	36	30
Truck, RTAA, XLWB Cargo, 7-ton, W/O Winch	D1062	$447,185	128	128	169	169	148
HIMARS, Armored Resupply Vehicle, Non-Reducible	D1063	$1,336,254	42	42	36	36	36
Truck, RTAA, Dump, 7-ton, W/O Winch	D1073	$475,839	59	59	34	34	29
Truck, Wrecker, 10X10 (LVSR)	D1214	$1,622,517	15	15	15	15	19

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Ordnance & Weapons							
Scout Sniper Day Scope (SSDS)	E0013	$2,670	364	364	364	364	255
Scout Sniper Mid-Range Night Sight (SSMRNS)	E0020	$8,795	378	378	378	378	361
Portable Lightweight Designator Rangefinder (PLDR)	E0042	$79,400	68	68	100	100	99
Saber System	E0055	$970,000	70	70	70	70	66
Modeled Meteorological Information Manager (MMIM)	E0059	$35,000	13	13	13	13	8
TALON	E0066	$177,543	2	2	2	2	6
EOD AN/PLT-4 Transmitter (CITADEL II)	E0090	$24,699	2	2	2	2	6
EOD AN/PLT-5 Transmitter (CITADEL III)	E0092	$108,827	2	2	2	2	6
M27 Infantry Automatic Rifle (IAR)	E0100	$2,815	2,791	2,791	2,791	2,791	3,251
Semiautomatic Sniper System (SASS)	E0103	$8,500	167	167	167	167	136
Machinegun .50 Cal Qcb	E0123	$12,886	291	291	291	291	589
Light Armored Vehicle - Electronic Warfare (LAV-EW)	E0133	$6,485,011	0	0	0	0	3
Radiac Set AN/PDX-2	E0153	$191,186	1	1	1	1	3
Sight, Weapon Thermal	E0156	$7,840	333	333	333	333	192
Circle, Aiming	E0180	$3,913	91	91	92	92	96
Javelin	E0207	$133,063	60	60	56	56	64
Howitzer, Lightweight, Towed, 155mm	E0671	$2,500,000	48	48	48	48	48
Assault Amphibious Vehicle (AAV), Command	E0796	$3,719,875	9	9	9	9	6
Assault Amphibious Vehicle, Personnel	E0846	$3,229,583	182	182	182	182	129
Assault Amphibious Vehicle, Recovery	E0856	$4,054,968	5	5	7	7	5
Launcher, Rocket, Assault, 83mm	E0915	$31,650	171	171	171	171	189
Light Armored Vehicle (LAV), Anti-Tank	E0942	$2,091,280	12	12	24	24	18
LAV, Command & Control (Battalion)	E0946	$3,255,380	11	11	16	16	18
LAV, Light Assault, 25mm	E0947	$3,224,110	87	87	68	68	88
LAV, Logistics	E0948	$1,883,020	22	22	40	40	30
LAV, Mortar	E0949	$2,507,080	13	13	12	12	18
LAV, Maintenance/Recovery	E0950	$2,183,920	8	8	8	8	9
Machine Gun, Cal .50, Browning, HB Flexible	E0980	$16,575	558	558	627	627	561
Machine Gun, Medium, 7.62mm, Ground Version	E0989	$8,590	1,473	1,473	1,404	1,404	1,310
Heavy Machine Gun, 40mm	E0994	$15,320	558	558	540	540	513
Common Laser Range Finder System	E1048	$26,236	469	469	514	514	514
Mortar, LW Company, 60mm, M224A1	E1065	$64,652	66	66	63	63	72
Mortar, Medium, 81mm, Extended Range	E1095	$47,043	68	68	68	68	76
Neutralization Device, Ordnance, Remote, MK3MOD0	E1385	$259,279	2	2	3	3	3
Rifle, Sniper, 7.62mm, M40A5	E1460	$7,503	210	129	129	129	56
Rifle, Scoped, Special Application, .50 Cal.	E1475	$12,078	71	71	67	67	63
Rocket System, Artillery, High Mobility (HIMARS)	E1500	$10,500,000	18	18	18	18	18
Receiver, Infrared (Stinger)	E1837	$24,143	3	3	4	4	4
Sight, Weapon, Thermal, Medium (MTWS)	E1975	$11,300	1,216	1,216	1,216	1,216	1,098
Sight, Weapon, Thermal, Heavy (HTWS)	E1976	$11,999	1,193	1,193	1,193	1,193	1,100

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Note: The above table reflects estimated on-hand and Reserve-In-Stores quantities against the full wartime requirement. USMC equipping strategy is that the RC maintains on-hand a Training Allowance only. The Training Allowance is the portion of the wartime requirement necessary to conduct home station training. USMC operating concepts rely on global sourcing and pre-positioned assets for combat. When activated, the USMC plans on RC units falling in on either pre-positioned equipment or assets already in theater from previous rotations.							

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Table 2

Average Age of Equipment

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Aircraft, Fighter/Attack, F/A-18A++	F/A-18A++	34	
Aircraft, Fighter/Attack, F/A-18C+	F/A-18C+	31	
Aircraft, Refueling/Cargo, KC-130T	KC-130T	27	
Aircraft, Refueling/Cargo, KC-130J	KC-130J	10	
Aircraft, Utility/Cargo, UC-12W	UC-12W	10	
Aircraft, Utility/Cargo, UC-35C	UC-35C	20	
Aircraft, Utility/Cargo, UC-35D	UC-35D	12	
Aircraft, Fighter, F-5F	F-5F	40	
Aircraft, Fighter, F-5N	F-5N	40	
Tilt-rotor, Cargo, MV-22B	MV-22B	13	
Helicopter, Attack, AH-1Z	AH-1Z	4	
Helicopter, Attack, AH-1W	AH-1W	28	
Helicopter, Utility, UH-1Y	UH-1Y	5	
Helicopter, Cargo, CH-53E	CH-53E	22	
RQ-21A Blackjack System	RQ-21A	3	
Communications/Electronics			
High Frequency Vehicle System	A0067	14	
Radio Set	A0153	11	
Very Small Aperture Terminal - Small (VSAT-S)	A0234	7	
Very Small Aperture Terminal - Medium (VSAT-M)	A0241	7	
Very Small Aperture Terminal - Large (VSAT-L)	A0242	7	
VSAT Master Reference Terminal (MRT)	A0244	11	
Combat Operations Center (COC) V(3)	A0254	5	
Combat Operations Center (COC) V(4)	A0255	5	
Combat Operations Center (COC) V(2)	A0271	5	
Radio Set	A1957	22	
Motor Transport			
Truck, Armored, Cargo 7-ton, W/O Winch Reducible	D0003	13	
Truck, Armored, XLWB, W/O Winch Reducible	D0005	13	
Truck, Armored, Dump 7-ton W/O Winch Reducible	D0007	10	
Truck, RTAA, Tractor, 7-ton, W/O Winch	D0009	8	
Truck, Armored, Tractor, 7-ton, W/O Winch, Reducible	D0013	8	
Truck, Armored, Wrecker, 7-ton, W/Winch Non-Reducible	D0015	8	
Truck, Utility, Expanded Capacity, Enhanced, M1152	D0022	11	

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Table 2

Average Age of Equipment

Nomenclature	Equip No.	Average Age	Remarks
Truck, Utility, Expanded Capacity, Armament Carrier	D0030	11	
Truck, Utility, Expanded Capacity, C2/GP Vehicle	D0031	11	
Truck, Utility, ECV, TOW Carrier, Armored	D0032	11	
Truck, Utility, Expanded Capacity, Fully-armored (2-door)	D0033	11	
Truck, Utility, Ground Mobility Vehicle, Armored (4-door)	D0034	11	
Truck, RTAA, Cargo, 7-ton, W/O Winch	D0198	13	
Semitrailer, Refueler, 5,000 gal	D0215	17	
Semitrailer, Lowbed, 40-ton	D0235	17	
Trailer, Cargo, Resupply for HIMARS	D0861	13	
Truck Cargo 22.5-ton, 10X10, (LVSR)	D0886	8	
Truck, Tractor, 10X10 (LVSR)	D0887	6	
Truck, Ambulance, 4-Litter, Armored, 2 1/4-ton, HMMWV	D1001	16	
Truck, Ambulance, 2-Litter, Soft Top, 2 1/4-ton, HMMWV	D1002	16	
Truck, RTAA, XLWB Cargo, 7-ton, W/O Winch	D1062	13	
HIMARS, Armored Resupply Vehicle, Non-Reducible	D1063	10	
Truck, RTAA, Dump, 7-ton, W/O Winch	D1073	10	
Truck, Wrecker, 10X10 (LVSR)	D1214	7	
Ordnance & Weapons			
Saber System	E0055	8	
Javelin	E0207	8	
Equipment Set, Night Vision	E0330	29	
Howitzer, Lightweight, Towed, 155mm	E0671	10	
Assault Amphibious Vehicle (AAV), Command	E0796	44	
Assault Amphibious Vehicle, Personnel	E0846	44	
Assault Amphibious Vehicle, Recovery	E0856	44	
Launcher, Rocket, Assault, 83mm	E0915	36	
Launcher, Tubular, F/GM TOW Weapon System	E0935	32	
Light Armored Vehicle (LAV), Anti-Tank	E0942	27	
LAV, Command & Control (Battalion)	E0946	18	
LAV, Light Assault, 25mm	E0947	24	
LAV, Logistics	E0948	21	
LAV, Mortar	E0949	24	
LAV, Maintenance/Recovery	E0950	32	
Recovery Vehicle, Full-tracked, Heavy, W/Equip	E1378	11	
Rocket System, Artillery, High Mobility (HIMARS)	E1500	10	
Tank, Combat, Full-tracked, 120mm Gun	E1888	21	

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Table 3

Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2022 would be expected to arrive in RC inventories in FY 2023 or FY 2024. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
FY 2019 NGREA Equipment			
F-5 Filthy Buzzard Pods	$14,055,000		
F/A-18 Filthy Buzzard Pods	11,243,000		
Force Protection Large / 40' Patrol Boats	9,600,000		
Tactical Communications Equipment	8,372,179		
Weapons Simulators	2,499,135		
HSC-85 MH-60S Equipment	3,890,573		
Cargo Handling Equipment	2,416,776		
Concrete Mixer	1,050,000		
C-130 Corrosion Correction Equipment	820,867		
MH-60R Link 16 Terminal Upgrade	773,624		
LCSRON Support Equipment	645,710		
F-5 Aircraft Protective Equipment	1,141,429		
C-40A Weather Radar Upgrade	172,433		
C-37A Safety Upgrades	191,000		
F-5 Block Upgrade	4,500,000		
F-5 Maintenance Support Equipment	2,301,333		
F-5 Avionics Upgrade	1,326,941		
Total	**$65,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

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Table 5

Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty	Remarks
Aircraft, Refueling/Cargo, KC-130J	KC-130J	TBD		TBD	Receive 1 KC-130J in FY 2021. DC Aviation has not published projected transfers of KC-130Js to the RC beyond FY 2021, due to unknown production and delivery schedule from manufacturer.
Aircraft, Fighter Adversary, F-5N	F-5N	+1	+1	+3	With the FY 2020 NDAA line item for purchasing F-5N aircraft from the Swiss, the Marine Corps Reserve anticipates a total of (16) F-5N aircraft in FY 2024
Aircraft, Fighter Adversary, F-5F	F-5F	+1	+1	+1	With the FY 2020 NDAA line item for purchasing F-5F aircraft from the Swiss, the Marine Corps Reserve anticipates a total of (4) F-5F aircraft in FY 2024

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Table 6

FY 2018 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2018 with actual procurements and transfers. FY 2018 is selected as these are the most recent funds to expire. Because the procurement cycle is normally one to two years from funding to delivery, this table identifies only deliveries through the end of FY 2020. Procurement and NGREA columns reflect cost values in dollars.

Nomenclature	Equip No.	FY 2018 Transfers (# of items)		FY 2018 Procurements ($s)		FY 2018 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2018 Planned Transfers & Withdrawals							
Aircraft, Refueling/Cargo, KC-130J	KC-130J	0	6				
Aircraft, Refueling/Cargo, KC-130T	KC-130T	0	-3				
Deployable End Office Suite - Transition Switch Module (TSM)	A0125	-1	-30				
Radar Set (LCMR)	A0169	0	-5				
FY 2018 Service Procurement Programs – RC (P-1R) Equipment							
Weapons and Combat Vehicles							
Assault Amphibious Vehicle (AAV7A1) Product Improvement Program (PIP)				$321,000	$321,000		
155mm Lightweight Towed Howitzer				9,000	9,000		
High Mobility Artillery Rocket System (HIMARS)				3,190,000	3,190,000		
Modification Kits				2,508,000	2,508,000		
Guided Missiles and Equipment							
Anti-Armor Missile-Javelin				174,000	174,000		
Anti-Armor Missile-TOW				211,000	211,000		
Communications and Electronics Equipment							
Items under $5M (Communications & Electronics)				46,000	46,000		
Radar Systems				3,647,000	3,594,000		
Fire Support System				668,000	668,000		
Intelligence Support Equipment				1,006,000	1,006,000		
Command Post Systems				1,449,000	1,449,000		
Communications Switching & Control Systems				2,440,000	2,440,000		
Support Vehicles							
Commercial Cargo Vehicles				8,919,000	8,919,000		
Motor Transport Modifications				192,000	192,000		
Family of Tactical Trailers				662,000	662,000		
Engineer and Other Equipment							
Environmental Control Equipment Assort				1,405,000	1,405,000		
Tactical Fuel Systems				893,000	893,000		
Power Equipment Assorted				1,788,000	1,788,000		
Amphibious Support Equipment				274,000	274,000		
Family of Construction Equipment				2,624,000	2,624,000		
Items less than $5M (Engineer)				82,000	82,000		
Spares and Repair Parts				362,000	362,000		

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Table 6

FY 2018 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2018 Transfers (# of items)		FY 2018 Procurements ($s)		FY 2018 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2018 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
F-5 N/F Martin Baker MK - 16 Ejection Seat						$4,100,000	$4,100,000
RQ-21A Mission Training Device						65,000	0
RQ-21A Production Spares Pack-up						4,180,000	4,117,974
AH-1Z Flight Training Device (FTD) Initial Spares Package						1,250,000	301,124
Radio Set, AN/PRC-117G						3,405,000	4,480,902
Total				**$32,870,000**	**$32,817,000**	**$13,000,000**	**$13,000,000**

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Table 7

Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is deployable in wartime. This data meets the Title 10 requirement to identify substitutes that are not the most desired equipment item.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No

Service Does Not Use Substitution to Satisfy Major Item Equipment Requirements.

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Table 8

Significant Major Item Shortages

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Joint Light Tactical Vehicle (JLTV)	2,053	2,053	$339,000	$695,967,000	The JLTV is a joint Army/Marine Corps program to procure the next generation of light tactical vehicles and companion trailers. The vehicle design provides the warfighter with increased protection through the use of scalable armor solutions, while restoring payload capabilities lost due to the armoring of the high mobility multipurpose wheeled vehicle (HMMWV) fleet. Full rate production and fielding are scheduled to begin in FY 2019. The Marine Corps plans to procure 15,390 JLTVs. The RC is slated to receive a total of 2050 vehicles starting in FY 2022 with FOC slated for FY 2030.
2	F-5 N/F block upgrades	12	12	Varies	$61,170,000	The F-5 is a significant part of the USMCs overall capability in tactical aviation training. It is the DoN's only tactical jet without basic safety features; as an adversary aircraft, it is flown in some of the most dynamic roles. The impact of the current cockpit instrumentation will increasingly degrade F-5 readiness because of the lack of basic safety features, extreme obsolescence, and sustainment challenges. Upgrading the old/obsolete instrumentation and adding required safety features will avoid degraded readiness and mitigate mishaps. Total cost for block upgrade is: $54.750M, with add-in upgrades totaling: $6.42M.
3	Meteorological Mobile Facility (Replacement) Next Generation (V)2 IBV	1	1	$1,900,000	$1,900,000	The AN/TMQ-56 METMF(R) NEXGEN is a lightweight, mobile, fully integrated, FORCENet compliant tactical meteorological support system. The METMF(R) NEXGEN enables the Marine Meteorological and Oceanographic (METOC) analyst to effectively turn relevant METOC data into actionable knowledge which can facilitate timely operational decision-making. The system is built into a standard shelter and mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) with a towable trailer. The METMF(R) NEXGEN (V)2 Intelligence Battalion Variant (IBV) is a modular, man-portable system that provides for limited functions of environmental sensing and data ingest and does not contain the vehicle, the shelter itself, or the trailer.
4	Naval Integrated Tactical Environmental System (NITES-Next) INMARSAT Modual	Varies	Varies	Varies	$1,472,140	NITES-Next is employed by METOC Support Teams (MST) throughout the MAGTF in order to provide critical METOC information to operating forces conducting mission that are commonly in remote locations and harsh environments. NITES-Next is made up of three moduals: INMARSAT, Processing, and Sensor moduals. It is a portable, lightweight, rugged, and scalable, allowing mission requirements, network availability, and embarkation space to dictate how best to employ the system.

USMCR

Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
5	White Phosphor Night Vision Goggle Upgrade	1,408	1,408	$3,401	$4,788,608	Provides an increased visual environment by adding the White Phosphor Image Intensifiers to the current AN/AVS-9's used by aviators. Adding the white phosphor NVGs capability offers many benefits over the traditional green phosphor NVGS: Increased field of view, increased depth perception, increased spatial awareness to help mitigate against collisions, clearer targets and Landing Zone identification during night time operations
6	Marine Air Ground Tablet MAGTAB (Larg and Small variants)	512	512	$3,502	$1,793,024	The MAGTAB is an Officially Procured Personal Electronic Device OPPED specifically designed for use with tactical networks as part of Digital Interoperability for the MAGTF. The MAGTAB was designed specifically by Marines to provides increased communication, tactical awareness & capabilities, and increased mission planning.Procuring these assets would enable the Reserve Force to remain current and standardized with the rest of Marine Aviation and MAGTF tactical capabilities.
7	KC-130J Aircraft	28	17	$92,152,561	$1,566,593,537	Fielding of the KC-130J to the RC began in FY 2014 and will continue beyond FY 2023. The extended nature of this fielding timeline results in significant operational and training compatibility issues as the Active Component (AC) has already fielded the KC-130J. To date the RC has 11 aircraft delivered.
8	NETWORKING ON THE MOVE (NOTM) FAMILY OF SYSTEMS (FOS)	44	44	144,000	$6,336,000	A force multiplier on the battlefield, NOTM provides forward and main integrated C2 capabilities for bounding assaults to the edge of the battlespace; commanders are no longer geographically tethered to the COC. The NOTM capability is currently employed both in ground and air platforms.
9	Tactical Decision Kit	8	8	$273,000	$2,184,000	Tactical Decision Kits (TDK) provide a means to challenge Marines to think critically, innovate smartly, and adapt rapidly in complex environments against adaptive enemies.
10	UC-35D Engine Spares	2	2	$1,425,000	$2,850,000	New engine spares are required to support continued operation. Purchasing new engines is more cost effective than rebuild. Rebuild adds 5,000 hours of operation with required maintenance at 2,500 hours. At a cost of $2.6M not including the over and above cost of the rebuild, the total cost to rebuild existing engines and gain the operating time of a new engine is qadrouple the cost of a new engine. The new engines cost $2.85M and provide an additional 10,000 hours of operation with no over and above cost and no intermitant major maintenance, resulting in a cost savings.

Chapter 4
United States Navy Reserve (USNR)

I. Navy Overview

A. Navy Planning Guidance

The reemergence of long-term Great Power Competition (GPC), the evolving character of that competition, and the accelerating advancements in technology are spurring a period of transformation in the strategic environment, requiring the Navy to adapt its integrated naval force design and operating concepts to new realities. The Navy must be ready to respond as a single unit wherever and whenever there is need. The Navy must deliver the personnel, platforms, and operational capability necessary to secure vital sea lanes, stand by its allies, and protect the American people.[1]

GPC requirements dictate that the Navy Reserve (USNR) will pivot to a unit-centric model capable of rapidly deploying trained and ready forces while ensuring that force structure, resourcing, manning, and mobilization processes are aligned with the National Defense Strategy.[2] The ability of the USNR to be a Global Force Management (GFM) deployer and pre-deployment enabler depends on readiness. Being ready to win is not a passive undertaking. The USNR must deliberately focus its actions on readiness and infuse a sense of urgency in how it operates. This requires improved readiness systems and processes that better enable Reserve Sailors to contribute to the fight.[3]

B. Navy Equipping Policy

DoDI 1225.06, *Equipping the Reserve Forces*, states that all units will be equipped to accomplish assigned missions and shall have a responsive, balanced, and sustainable equipment and distribution program to effectively meet mission requirements. Units scheduled for deployment should be prioritized as equipment is distributed. Equipment priorities for Reserve Component (RC) units will be determined with the same methodology as Active Component (AC) units with the same mobilization mission and following Chief of Naval Operations (CNO) established guidance.

C. Plan to Fill RC Equipment Mobilization Requirements

In the past, reserve equipment allocation was planned and coordinated by the AC through the Planning, Programming, Budgeting, and Execution process. In 2020, the USNR began a shift to assume responsibility as a resource sponsor beginning with Program Objective Memorandum-23. The USNR maintains equipment as training or mobilization assets and, in many instances, will utilize AC equipment already in theater. In certain warfare areas, such as aviation and expeditionary, the RC maintains much of its own equipment for operational employment.

[1] Chief of Naval Operations Statement before the Senate Armed Services Committee, March 5, 2020.
[2] Chief of Navy Reserve Statement before the Senate Subcommittee on Defense, March 4, 2020.
[3] *Navy Reserve Action Plan*, January 2018.

Equipment requirements and shortfalls are identified during the resource allocation process, which the USNR then prioritizes.

D. Initiatives Affecting RC Equipment

In the *Navy Reserve Fighting Instructions*, the Chief of Navy Reserve states:

> We are focused unambiguously on warfighting readiness. It is my number one and only priority—period. We will generate the combat power and critical strategic depth the Navy requires to prevail in conflict in an era of great power competition. That's our job, and why we exist. All else is secondary.[4]

Three overarching principles are outlined for meeting this priority: Design, Train, and Mobilize the Force. In alignment with these principles, and to ensure that Reserve Sailors are ready to activate and serve on "Day One" throughout the spectrum of conflict at a resource-informed cost, the Navy and USNR have a number of ongoing initiatives to recapitalize or modernize most of its fleet of aircraft and patrol boat inventory. Examples of key USNR programs that require further investment are listed below:

- **K/C-130T Hercules**: The K/C-130T is a unique Fleet logistics enabler capable of airlifting outsized cargo (weapons, submarine masts, small aircraft, etc.) that the AC is unable to transport organically. However, while the mission of Reserve K/C-130T aircraft is essential, aircraft age and associated parts availability and maintenance issues present significant challenges that negatively affect aircraft readiness and Fleet support capability.

  The most desirable and longest-term solution to increase readiness and meet increasing Fleet demand is to recapitalize the existing K/C-130T aircraft with the more supportable and capable KC-130J. To mitigate existing challenges with the K/C-130T fleet and maintain global support operations, Commander, Naval Air Force Reserve (CNAFR) has undertaken several modernization initiatives including a substantial avionics safety upgrade and procurement of a modern anti-skid system.

- **FA-18E/F Super Hornet and F-16C Fighting Falcon**: As part of the RC Tactical Support Wing (TSW), VFA-204 and VFC-12 provide critical 4th generation adversary support to the Fleet by emulating the capabilities and tactics of threat nation air forces. In FY 2021, VFC-12 will transition from the FA-18C/D Hornet to the FA-18E/F Super Hornet, and in 2022 VFA-204 will begin transitioning from the FA-18C/D Hornet to the F-16C Fighting Falcon. To continue providing the Fleet with advanced, high-fidelity adversary support, future funding will be required to modernize these aircraft with threat representative capabilities like Infrared Search and Tracking Systems.

- **F-5 N/F Tiger II:** USNR F-5N/F squadrons provide dedicated professional adversary support to the Fleet. These aircraft provide 60 percent of the U.S. Navy's professional adversary support sorties, primarily to Fleet Replacement squadrons and Fleet squadrons going through Advanced Readiness Program syllabi and Air Wing training.

[4] *ALNAVRESFOR 025/20: NAVY RESERVE FIGHTING INSTRUCTIONS 2020.*

The F-5N/F fleet must be modernized for safety and training relevance. These aircraft were designed in the mid-1950s, and much of the technology is unchanged. At present, several F-5N/F aircraft are undergoing a necessary block upgrade that brings modernized cockpits and a digital architecture. Block upgraded aircraft will be safer to operate, with more advanced tactical systems and better threat representation, and will provide higher fidelity training to Fleet customers. Additional funding will be required to complete this effort.

- **MH-60S Seahawk:** HSC-85 is the USNR's only Helicopter Sea Combat (HSC) squadron. It is also the Navy's only dedicated Special Operations Forces (SOF) support squadron. In FY 2019, the squadron completed its transition from the HH-60H to the MH-60S, which offers lower operating costs and enhanced compatibility with the AC HSC community. NGREA-funded temporary modernization efforts enabled HSC-85 to rapidly deploy the Navy's first MH-60S detachment with a GAU-17 capability post HH-60H sundown. Future funding will be required to ensure HSC-85 can maintain and expand this capability and continue to provide lethal and agile Reserve assets to support the Fleet.
- **Maritime Expeditionary Security Force (MESF)**: Formerly the Coastal Riverine Force, MESF is the only force provider for port security and harbor defense within the Department of Defense (DoD). With the current 34-foot Patrol Boat (34PB) operating past its service life, the Navy has begun to procure the 40-foot Patrol Boat (40PB) as the fleet replacement. The 40PB will be procured over a 15-year period 2018–2033. In FY 2014, the USNR MESF assumed Continental United States (CONUS) high-value unit escort missions from the U.S. Coast Guard. In FY 2019, that encompassed six locations across both coasts. The RC MESF continues to support this mission while forward-deployed. Other critical MESF equipment procurement needs include Patrol Boat navigation simulators, Patrol Boat prime mover trucks, and mobile SATCOM equipment.

E. Plan to Achieve Full Compatibility between AC and RC

To compete and win in a GPC requires a depth of assets. This depth can only be built through AC/RC compatibility and interoperability. To ensure effective and efficient execution, it is absolutely critical that the Navy and USNR work in concert to achieve and maintain synergy within the Total Force. Along with various upgrade and recapitalization efforts, the following are several recent NGREA procurements helping the RC to keep pace:

- 40' Patrol Boats
- Standard Navy Double-lock Recompression Chamber
- MH-60R VHF Omni-Directional Ranging/Instrument Landing System
- Undersea/Subsurface Remotely Operated Vehicle Suite.

Without a continued focus on interoperability, the USNR will fall behind the AC and therefore the demands of GPC.

II. Navy Reserve Overview

A. Current Status of the Navy Reserve

1. General Overview

An integral part of the U.S. Navy, the RC is comprised of 101,000 citizen Sailors, including 49,000 Selected Reservists, 42,000 Individual Ready Reservists, and 10,000 Full Time Support members, from every state and territory. Historically comprising less than 2 percent of the Navy's total annual budget, USNR Sailors have mobilized over 92,000 times to every theater of operation since 2001.

Top Navy Reserve Focus Area: AC/RC Compatibility

- Keeping RC aircraft recapitalization on pace with AC recapitalization
- Modernizing key RC capabilities to increase lethality and agility
- Investing in Expeditionary Logistics in support of Distributed Maritime Operations

Aligned with guidance from the National Military Strategy and the CNO's *Design for Maintaining Maritime Superiority 2.0*, the USNR is rebalancing to meet the dynamic challenges of today and the threats of tomorrow. It is building a more lethal and ready force, focused on capabilities, as an essential element of naval power in an era of GPC.[5]

The USNR provides crucial capabilities for urgent missions and operational support. Recent examples include:

- VAQ-209 deployed to Misawa Air Force Base, Japan for three months in FY 2020 in direct support of SEVENTH Fleet operations. In addition to its core Airborne Electronic Attack mission, the squadron regularly executed Air Defense/Air Intercept missions normally reserved for Navy and Air Force dedicated fighter aircraft.
- HSC-85 maintains an enduring four aircraft detachment in the INDOPACOM area of responsibility. As the Navy's only dedicated Special Operations support squadron, they provided uninterrupted support to deployed U.S. Special Operations Command forces in 2020, participating in multiple international large force exercises.
- HSM-60 deployed multiple times in FY 2020 to perform the Anti-Submarine Warfare (ASW) mission. The squadron also executed two short-notice deployments to FOURTH Fleet onboard U.S. Navy vessels where they performed Counter-Illicit Trafficking (CIT) missions alongside U.S. Coast Guard personnel. HSM-60 is the only Navy helicopter maritime strike squadron (HSM) manned and equipped to execute this mission at night because it has a night Head Up Display capability procured using NGREA.
- From Guam to Key West, USNR Adversary squadrons continued to provide the majority of the Navy's professional airborne adversary support. These four squadrons supported Fleet Replacement Squadron initial air-to-air training, Fleet squadron unit-level air-to-air-training, and advanced graduate level training for Tactical Air (TACAIR) Advanced Readiness Programs, Air Wings, and Battle Groups.

[5] Chief of Navy Reserve Statement, Hearing before the Senate Appropriations Committee Subcommittee on Defense, April 10, 2019.

- From the outset of the pandemic, USNR logistics aircraft provided thousands of hours in direct support of the Navy's COVID-19 mitigation and relief efforts. In one example, VR-57 (C-40A) received urgent tasking from PACFLT to move medical personnel and COVID-19 test kits from San Diego to Guam to support the crew of USS Theodore Roosevelt (CVN 71). The aircraft touched down in Guam 19 hours after the initial tasking was received, epitomizing the responsiveness and effectiveness of Navy Unique Fleet Essential Aircraft (NUFEA) under the most trying circumstances.
- In November 2019, USNR logistics aircraft supported the rapid deployment, sustainment, and return of Patrol Squadron Sixteen in response to emerging submarine threats in the North Atlantic. With less than 24-hour notice, a USNR C-130T was dispatched to deploy 38 operational support personnel and required mission equipment from Jacksonville, FL, to Keflavik, Iceland. Continued mission support was provided by an enduring USNR detachment in Sigonella, Italy. USNR aircraft resupplied Patrol Squadron Sixteen with sonobuoys, facilitated their redeployment to Lajes, Portugal, and eventually brought them home at the conclusion of their mission. This mission highlights how NUFEAs can provide the Navy with organic airlift capability to rapidly deploy warfighting assets in response to real world threats.
- Throughout FY 2019 and FY 2020, Navy Cargo Handling Battelions (NCHB) 11, 13, 8, and 10 deployed RC Sailors to CENTCOM, AFRICOM, and INDOPACOM under recurring GFM requirements to provide logistics support to entities such as CTF 56, CTF 75, and Joint Special Operations Command.
- In April 2020, NAVELSG RC and FTS Sailors assigned to CTF-75 executed the offload of an Expeditionary Medical Facility from a Maritime Prepositioning Ship, the USNS Dahl, in support of the whole-of-government response to the COVID-19 pandemic.

a. Naval Air Force Reserve

The Naval Air Force Reserve provides critical GFM assets and personnel the Navy needs to prepare for and defeat current and future threats. It is comprised of 7,600 personnel and 150 aircraft that make up three Air Wings, two Joint Reserve Bases, and one Naval Air Facility. Fleet Logistics Support Wing (FLSW) and TSW are based at Naval Air Station (NAS)–Joint Reserve Base Fort Worth, TX, and Maritime Support Wing is headquartered at NAS North Island, CA. Naval Air Forces Reserve Joint Reserve Bases are in Fort Worth, TX, and New Orleans, LA, and Naval Air Facility Washington is co-located with Andrews Air Force Base. The USNR also operates 23 Reserve Squadrons and 30 Squadron Augment Units who either deploy regularly or provide critical pre-deployment support to Fleet customers.

3 Wings / 21 Squadrons / 2 Shore Commands

NAS Whidbey Island, WA
VAQ-209 (6 x E/A-18G)
VR-61 (3 x C-40A)
VP-69 (6 x P-3C)

NAS Fallon, NV
VFC-13 (14 x F-5N/F)

NAS Pt Mugu, CA
VR-55 (5 x K/C-130T)

NAS North Island, CA
CNAFR Headquarters
Maritime Support Wing (MSW)
VR-57 (3 x C-40A)
HSC-85 (10 x MH-60S)

MCAS Kaneohe Bay, HI
VR-51 (2 x C-40A)

JB Pearl Harbor, HI
ETD Pacific (1 x C-37A)

NAS JRB Fort Worth, TX
Tactical Support Wing (TSW)
Fleet Logistics Support Wing (FLSW)
VR-59 (3 x C-40A)

New Orleans, LA
Navy Air Logistics Office (NALO)
VFA-204 (12 X F/A-18C)
VR-54 (4 x K/C-130T)

JB McGuire, NJ
VR-64 (5 x K/C-130T)

NAF Washington, DC
VR-1 (3 x C-37B)
VR-53 (5 x K/C-130T)

NAS Oceana, VA
VFC-12 (15 x F/A-18A-D)
VR-56 (3 x C-40A)

NB Norfolk, VA
HM-14* (4 x MH-53E)
HM-15* (4 x MH-53E)

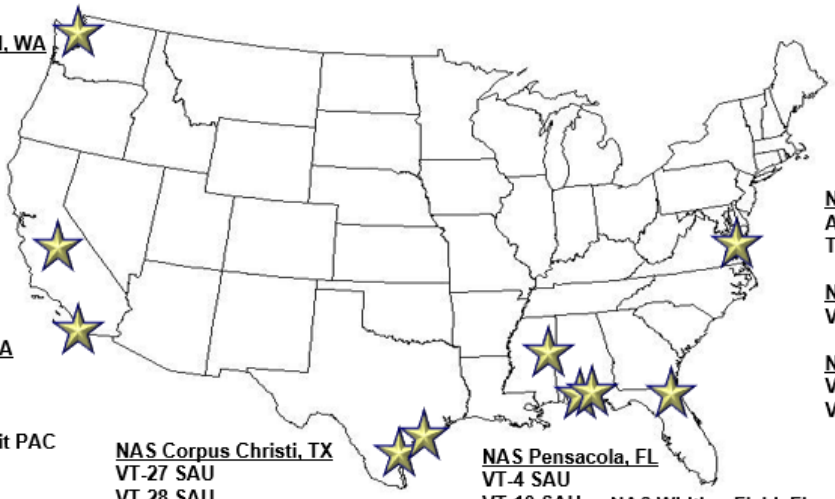
NAS Jacksonville, FL
VR-58 (3 x C-40A)
VR-62 (5 x K/C-130T)
HSM-60 (7 x MH-60R)
VP-62 (6 x P-3C)

NAS Key West, FL
VFC-111 (17 x F-5N/F)

Enduring Detachments
NSA Bahrain (C-40A + K/C-130T)
NAS Sigonella, Sicily (C-40A + K/C-130T)
NAF Atsugi, Japan (C-40A + K/C-130T)
Kadena AFB, Okinawa (4x MH-60S)

* Integrated AC / RC Squadron

30 Squadron Augment Units (SAUs)



NAS Whidbey Island, WA
VAQ-129 SAU

NAS Lemoore, CA
VFA-122 SAU
VFA-125 SAU

NAS North Island, CA
HSC-3 SAU
HSM-41 SAU
HSC-3 SCORE DET
Tactical Support Unit PAC
VRM-30 DET SIX

NAS Corpus Christi, TX
VT-27 SAU
VT-28 SAU
VT-31 SAU
VT-35 SAU

NAS Kingsville, TX
VT-21 SAU
VT-22 SAU

NAS Meridian, MS
VT-7 SAU
VT-9 SAU

NAS Pensacola, FL
VT-4 SAU
VT-10 SAU
VT-86 SAU

NAS Whiting Field, FL
VT-2 SAU
VT-3 SAU
VT-6 SAU
HT-8 SAU
HT-18 SAU
HT-28 SAU

NB Norfolk, VA
ACCLOGWING SAU
Tactical Support Unit LANT

NAS Oceana, VA
VFA-106 SAU

NAS Jacksonville, FL
VP-30 SAU
VUP-19 Reserve Component

Reserve Maritime Patrol and Reconnaissance Force (MPRF): MPRF provides operational support to forward commanders while maintaining surge readiness to rapidly mobilize in the event of war or national emergency. To increase lethality in the maritime domain, Commander, Naval Air Force Reserve is focused on P-3C sustainment in support of the Littoral Surveillance Radar System (LSRS) mission, P-8A recapitalization, and supporting the MQ-4C Triton mission.

P-3C Orion: The RC operates two MPRF P-3C squadrons: VP-62 based at NAS Jacksonville, FL, and VP-69 at NAS Whidbey Island, WA. Squadrons are manned, trained, and equipped to provide combat deployments and perform the core missions of ASW and Anti-Surface Warfare (ASuW) while maintaining combat-ready ISR or LSRS aircraft and aircrews, a mission supported exclusively by the RC until the service-life expiration of their P-3C fleet in FY 2022.

Recapitalization is planned for FY 2023 and FY 2024 with eleven P-8A aircraft apportioned to the USNR. One additional P-8A is required to fully transition both squadrons.

Reserve Helicopters: The Reserve rotary wing force provides two RC and two blended AC/RC squadrons that execute regular combat deployments and detachments in their respective platforms.

MH-60S Knighthawk: The MH-60S is a multi-mission helicopter capable of performing Surface Warfare, Maritime Interdiction Operations, SOF Support, Personnel Recovery, Combat Search and Rescue, Casualty Evacuation, Search and Rescue (SAR), Vertical Replenishment, Non-Combatant Evacuation Operations, and Humanitarian Assistance/Disaster Relief (HA/DR).

The RC operates one MH-60S squadron: HSC-85, based at NAS North Island, CA. HSC-85 is the Navy's only dedicated Special Operations support squadron. They are capable of performing all core mission sets, while providing dedicated SOF capability for an enduring detachment in support of Special Operations Command Pacific.

MH-60R Seahawk: The MH-60R is the Navy's shipboard submarine hunter, capable of performing ASW and ASuW, as well as Airborne Use of Force in support of the CIT mission.

The RC operates one MH-60R squadron, HSM-60, based in JAS Jacksonville, FL. HSM-60 utilizes the same hardware as the AC, and is trained and equipped to execute all core mission sets. They regularly execute deployments in support of GFM tasking.

MH-53E Sea Stallion: The MH-53E is a heavy-lift helicopter capable of supporting Airborne Mine Countermeasures (AMCM), Vertical Onboard Delivery operations, HA/DR, and Defense Support of Civil Authorities.

RC personnel are embedded within two blended squadrons that report to Commander, Sea Combat Wing Atlantic: HM-14 and HM-15, both based at NAS Norfolk, VA. These squadrons represent the Navy's only heavy-lift helicopter capability. They are trained and equipped for all core mission sets and maintain combat detachments capable of worldwide rapid response AMCM support.

The Navy's MH-53E program is executing an in-service sustainment strategy to ensure continued AMCM and heavy-lift support to the Fleet until the transition to the Littoral Combat

Ship mine countermeasures mission package is complete, which is expected in FY 2024. Funding for HM-14 and HM-15 will reduce incrementally starting in FY 2022 and continue through the end of FY 2024 once the aircraft are fully divested.

FLSW: The Navy relies on its own combat logistics aircraft to enable the expeditionary posture inherent in naval operations. In peace or war, the USNR provides 100 percent of the Navy's organic intra-theater logistics support and airlift capability and fulfills the NUFEA requirement with its C-40A and K/C-130T aircraft. Together, they provide the flexible, responsive, and efficient global support the Fleet needs at a lower cost than other DoD and commercial logistics support options. FLSW C-40A and K/C-130T cost avoidance averages approximately $1.0 billion each year.

C-40A Clipper: The C-40A is a military variant of the Boeing 737. It has a 3,000nm range fully loaded and is reconfigurable to support passengers, cargo, or a combination of both. Established through Title 10 wartime requirements, the C-40A provides the Fleet with on-demand, medium cargo airlift capability to rapidly support ongoing naval operations. Examples of their services include critical weapons and parts resupply, global personnel movements, supply-chain linkage between commercial and shipboard delivery, and timely deployment and detachment support for myriad entities across the Navy.

The RC operates six C-40A squadrons: VR-51 at MCBH Kaneohe Bay, HI; VR-56 at NAS Oceana, VA; VR-57 at NAS North Island, CA; VR-58 at NAS Jacksonville, FL; VR-59 at NAS Joint Reserve Base (JRB) Fort Worth, TX; and VR-61 at NAS Whidbey Island, WA. Additionally, these squadrons collectively provide continuous detachment coverage with a minimum of one aircraft in each of three locations: NAS Bahrain; NAS Sigonella, Italy; and NAF Atsugi, Japan.

While the Navy achieved its reduced-risk inventory objective of 17 C-40A aircraft, the warfighting requirement remains 23. Sustaining the C-40A fleet must remain a high priority to ensure that the Navy continues to receive the support it requires in wartime and contingency operations.

K/C-130T Hercules: Like the C-40A, Navy K/C-130T Hercules aircraft provide the Fleet with rapid, on-demand, medium cargo airlift in support of ongoing naval operations. The K/C-130T is also able to airlift outsized cargo (larger weapons, submarine masts, small aircraft, etc.) that does not fit in the C-40A, which makes it a critical logistics enabler for the Fleet. They are typically kept in a cargo-only configuration, but can be quickly configured to support passengers as well.

Recapitalizing the USNR K/C-130T fleet with KC-130Js is the Chief of Navy Reserve's top priority to ensure that the Navy is able to receive the support it requires in future wartime and contingency operations. In the interim, several stop-gap modernization efforts are underway, including the acquisition of six additional KC-130T aircraft from USMC by the end of FY 2022.

The RC operates five K/C-130T squadrons: VR-53 at Joint Base Andrews, MD; VR-54 at NAS JRB New Orleans, LA; VR-55 at NAS Point Mugu, CA; VR-62 at NAS Jacksonville, FL; and VR-64 at McGuire AFB, NJ. The squadrons also collectively provide continuous detachment

coverage with a minimum of one aircraft in each of three locations: NSA Bahrain; NAS Sigonella, Italy; and NAF Atsugi, Japan.

Service Secretary Controlled Aircraft (SSCA): The Secretary of the Navy's SSCA aircraft, operated by CNAFR, provide DoD required-use travelers with on-demand airlift equipped with continuous secure communications while airborne. These aircraft provide airlift capability for senior Service officials when a threat exists that could endanger lives or when there is a need to satisfy short-notice travel requirements that make commercial transportation unacceptable.

VR-1 is based at Joint Base Andrews, MD, and operates the C-37B, a military variant of the Gulfstream 550. VR-1 also maintains one forward-deployed Executive Transport Detachment located at Joint Base Pearl Harbor-Hickam, HI, which operates the C-37A, a military variant of the Gulfstream V.

TSW: TSW provides expeditionary Airborne Electronic Attack and airborne Adversary support to the Navy.

EA-18G Growler: The EA-18G Growler provides full-spectrum Airborne Electronic Attack from land bases and aircraft carriers to exploit, suppress, degrade, and deceive enemy electromagnetic defensive and offensive systems in support of amphibious assaults, air strikes, and Fleet operations.

The RC has one EA-18G squadron, VAQ-209, based in Whidbey Island, WA. VAQ-209 deploys regularly to mitigate VAQ operational capacity gaps while providing a formidable strategic capability at a reduced cost. They are able to leverage their Reserve aircrew's civilian skillsets to link government entities outside the Navy directly to the squadron, which creates dynamic and diverse synergies not found in their AC counterparts. VAQ-209 deploys every two years in support of GFM. They also regularly participate in various Joint or combined Large Force Exercises.

FA-18 Hornet: RC FA-18 Hornets provide high-fidelity, professional CAT IV Adversary support to the Fleet by emulating the capabilities and tactics of threat nation air forces. VFA-204 and VFC-12—located in NAS JRB New Orleans, LA, and NAS Oceana, VA, respectively—both support the Navy's TACAIR Advanced Readiness Programs, and advanced Air Wing and Strike Group large force exercises. VFC-12 also provides legacy Hornet transition training for all Navy pilots transitioning to the FA-18A-D, which qualifies RC and AC pilots to fly the FA-18A-D in support of the Blue Angels, the test community, the Naval Aviation Warfare Development Center, and CNAFR. TSW's FA-18C/D Hornet squadrons will transition to the FA-18E/F Super Hornet as well as USAF-acquired F-16C Fighting Falcons by the end of 2022.

F-5 Tiger II: USNR F-5N/F squadrons also provide dedicated professional Adversary support to the Fleet. Aircraft are flown to emulate threat nation tactics and capabilities. VFC-13 in NAS Fallon, NV, and VFC-111 in NAS Key West, FL, each provide undergraduate support to the Fleet Replacement Squadrons during air-to-air training detachments and graduate level training for Advanced Readiness Program and Air Wing Fallon events.

Modernization of the F-5N/F fleet is Commander, Naval Air Force Reserve's top priority for safety and training relevance. The current fleet of F-5 aircraft faces service life limitations which will be mitigated via the underfunded but ongoing Block Upgrade efforts and the procurement of 11 additional F-5 aircraft from the Swiss.

b. Navy Expeditionary Combat Command (NECC)

NECC's mission is to organize, man, train, equip, and sustain Navy Expeditionary Combat Forces to execute combat, combat support, and combat service support missions across the full spectrum of naval, joint, and combined operations that enable access from the sea and freedom of action throughout the sea-to-shore and inland operating environments. Approximately 50 percent of NECC personnel are Navy Reservists.

MESF: The USNR MESF is an operational reserve that protects critical maritime infrastructure, embarks in military and strategic sealift vessels, and escorts fleet units operating in and around ports across the world. In addition to conducting CONUS high value unit protection missions, the RC MESF conducts rotational deployments in support of AFRICOM and CENTCOM. It also provides mission-enabling augmentation to AC MESF as required. The most critical MESF equipment need is the 40PB and the 40PB prime mover. Both the 34PB and associated prime mover have reached critical maintenance and service life issues, requiring ever increasing maintenance and overhaul scheduling to meet mission requirements and increasing risk to personnel and readiness. The recapitalization plan is to procure 40PB for both AC and RC, an effort the RC has already begun with NGREA funding.

The RC MESF consists of four Mobile Security Squadrons (MSRON): MSRON 1 at San Diego, CA; MSRON 8 at Newport, RI; MSRON 10 at Jacksonville, FL; and MSRON 11 at Seal Beach, CA. Each MSRON has geographically dispersed subordinate companies and high value unit protection detachments.

Naval Construction Force (NCF): USNR NCF units provide a wide range of capability in support of Navy and Joint Forces, including the construction and repair of bridges, airfields, forward operating bases, and roads, as well as civic projects for partner nations. The RC NCF represents almost half of the total naval construction force capacity. The RC NCF consists of two Naval Construction Regiments (NCR) and five Naval Mobile Construction Battalions (NMCB). RC battalions continue to deploy as detachments in a rotation with AC in support of missions in the CENTCOM and AFRICOM areas of responsibility. Developing additional port and airfield damage repair capabilities in support of operational plan requirements will require additional investment to ensure compatibility with active NCF forces. Funding is also required to upgrade communications equipment. NMCB 14, NMCB 27, and 7th NCR are located in Gulfport, MS, while NMCB 18, NMCB 22, NMCB 25, and 1st NCR are homeported in Port Hueneme, CA.

Navy Expeditionary Logistics Support Group (NAVELSG): NAVELSG is a vital enabler of Maritime Prepositioning Forces, Joint Logistics Over the Shore operations, and maritime forces ashore, providing expeditionary cargo handling services for surface, air, and terminal operations; expeditionary refueling; and expeditionary ordnance handling/reporting/reloading to support worldwide Naval, Joint, interagency, and combined forces/organizations. Shortfalls exist in expeditionary reloading training equipment, material handling equipment, expeditionary

refueling, and organic mobility equipment to move large equipment in austere environments. The USNR accounts for over 90 percent of NAVELSG forces.

NAVELSG consists of three Navy Expeditionary Logistics Regiments (NELR) and six Navy Cargo Handling Battalions (NCHB): 2nd NELR, in Williamsburg, VA; 4th NELR in Jacksonville, FL; and 5th NELR in Point Mugu, CA. NCHB 5 is located at Tacoma, WA; NCHB 8 at Fort Dix, NJ; NCHB 10 at Yorktown, VA; NCHB 11 at Jacksonville, FL; NCHB 13 at Gulfport, MS; and NCHB 14 at Port Hueneme, CA.

c. Surface Warfare

RC Sailors support Surface Warfare through the following major surface and amphibious warfare areas: Littoral Combat Ship (LCS) support units, surface readiness detachments, surface and mine warfare development, afloat cultural workshops, Tactical Air Control Squadrons, and Naval Beach Group (NBG) activities consisting of Amphibious Construction Battalions, Naval Beach Master Units, and Assault Craft Units. Additionally, RC Sailors provide critical sustained operational support to worldwide surface deployments through the RC-to-Sea initiative.

Navy Reserve LCS Community: The USNR LCS mission is to provide and maintain trained RC Sailors and equipment in an optimized state of readiness to support global LCS mission requirements. RC LCS units are organized to provide strategic support for warfighting requirements as well as operational support during normal and surge operations. Shipboard maintenance and watch support remain the primary lines of effort for LCS Reservists. To support their mission, RC LCS units require fire arms training simulators for proficiency and various SAR, Anti-Terrorism Force Protection, and visit, board, search, and seizure equipment for real-world operations. LCS Reserve Squadrons (LCSRON) have multiple units across 17 locations with LCSRON ONE HQ at San Diego, CA, and LCSRON TWO HQ at Mayport, FL.

NBG: NBG consists of Assault Craft Units, Amphibious Construction Battalions, and Beach Master Units whose primary mission is to provide dedicated support to amphibious operations. The RC maintains qualified boat crews, beach masters, and Seabees in support of this effort. In addition, the RC owns, operates, and maintains 10 Maritime Prepositioning Force Utility Boats in five different locations for training on assault follow-on echelon offload mission support and several other homeport support requirements. Currently, NBG requires additional Improved Navy Lighterage Systems to train Navy reservists for deployment. NBG-1 is located in Coronado, CA, and NBG-2 is located in Little Creek, VA.

d. Naval Special Warfare (NSW)

For more than a decade NSW has relied on its RC to consistently provide 10 percent of their worldwide deployable capability, including 33 percent of its Unmanned Aerial Systems capacity. RC NSW has been at the forefront of innovation and transformation in the USNR Force by fully integrating with its AC counterpart. This provides additional lethal combat capability for NSW to accomplish its current operational mission downrange and ensures NSW maintains a robust operational reserve. RC NSW consists of three AC/RC hybrid commands and 12 USNR Units located in Coronado, CA, and Little Creek, VA, as well as 14 regional detachments dispersed across the country. RC NSW relies on a combination of programmed acquisition resourcing and

unprogrammed funds to procure the equipment required to maintain the highest state of RC readiness.

e. Military Sealift Command (MSC)

MSC is the Maritime Component Commander for sealift missions for U.S. Transportation Command and the Type Commander for MSC ships for U.S. Fleet Forces Command. MSC is the seaborne transportation provider for DoD with the responsibility of providing worldwide strategic sealift and ocean transportation for all military forces. MSC is represented by five geographic area commands (Atlantic, Pacific, Europe and Africa, Central, and Far East), which exercise tactical control of all assigned U.S. Transportation Command and MSC forces assigned to the numbered fleet commanders. MSC HQ is located in Norfolk, VA.

f. Submarine Force

The RC submarine force's four main missions are undersea warfare operations, expeditionary maintenance, force protection, and undersea rescue. RC Sailors support undersea warfare operations, thus enabling the AC to sustain 24/7 antisubmarine warfare operations both ashore and at sea. RC expeditionary maintenance Sailors augment submarine tender crews to provide maintenance support and voyage to deployed submarines worldwide. The RC undersea rescue teams provide critical assistance to rescuing Sailors from distressed undersea platforms. Additionally, the RC provides 56 percent of the submarine force's undersea rescue team and is ready to execute a submarine rescue from Coronado, CA, to anywhere in the world within 72 hours.

2. Status of Equipment

a. Equipment On-hand

Table 1 Consolidated Major Item Inventory and Requirements provides projected RC major equipment requirements and on-hand inventories to meet assigned missions.

b. Average Age of Major Equipment Items

With a Reserve Force that maintains increasingly older equipment, particularly aircraft, there is a compelling need to recapitalize or modernize the USNR's oldest assets. The USNR's primary concerns are K/C-130T aircraft (28 years old) and FA-18C/D aircraft (29 years old), both of which operate at higher than optimal costs per flight hour, produce lower readiness rates, and provide less capability than their projected replacement platforms.

Both RC FA-18C/D squadrons are programmed to transition to more modern airframes by the end of FY 2022. There is currently no funded plan to recapitalize Reserve K/C-130T aircraft.

c. Compatibility of Current Equipment with the AC

USNR equipment requires compatibility with the AC to support applicable Navy assigned missions. Achieving equipment compatibility with the AC is critical to ensuring the USNR has the ability to train to the same standards and operate seamlessly with AC counterparts. While procurement and upgrade programs, Congressional additions, and NGREA funds have helped

improve RC equipment capability and compatibility, significant challenges remain. *Table 8 Significant Major Item Shortages* provides the USNR equipment recapitalization priorities.

d. Maintenance Issues

USNR equipment maintenance remains a high priority. Due to competing fiscal priorities, depot throughput limitations, and high operations tempo, both the AC and the RC are confronted with maintenance shortfalls and backlogs. The USNR's high operational tempo has accelerated equipment degradation and service-life expenditure. Maintenance issues most significantly affect RC P-3C, K/C-130T, and FA-18C/D aircraft. USNR K/C-130T and Legacy FA-18C/D aircraft suffer from long and costly depot maintenance periods, a lack of qualified maintainers, service-life-related issues, and repair parts unavailability because of obsolescence. Modern aircraft such as the P-8A, FA-18E/F, F-16C and a Future Medium Lift Aircraft (K/C-130T replacement), would reduce maintenance and supply issues, avoid significant maintenance cost, and increase fleet support with reliable aircraft.

Modernization Programs and Shortfalls: The Department of the Navy maintains a prioritized list of unfunded equipment that is used to inform unfunded priority list (UPL) development. When directed, the CNO forwards the UPL to Congress for resourcing consideration. The USNR's top-10 unfunded equipment requirements are provided in *Table 8 Significant Major Item Shortages*.

B. Changes since the Last NGRER

The following statements represent the latest changes since the previous NGRER

- VFC-12 will transition from the F/A-18C/D to 10 F/A-18E/F by the end of FY 2021.
- CNAFR will complete acquisition of six additional USMC KC-130T aircraft in FY 2022.
- Nine P-8A's have been appropriated to the USNR in FY 2021.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2024 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements identifies major equipment requirements and on-hand inventories projected from FY 2022 to FY 2024.

2. Anticipated Withdrawals and Transfers from AC to RC

Table 5 Projected Equipment Transfer/Withdrawal Quantities identifies major RC equipment forecasted for withdrawal or decommissioning and anticipated equipment transfers from the AC to the RC.

Differences in *Table 5* between the FY 2021 and the FY 2022 NGRER:

- The USNR is scheduled to divest all Legacy F/A-18A-D aircraft by the end of FY 2022. These aircraft will be replaced with 12 F/A-18E/F aircraft at VFC-12 and 12 F-16C aircraft at VFA-204.
- The P-3C divestment schedule has been updated to reflect divestment at the end of FY 2022.
- Two P-8A will be delivered to VP-62 in FY 2022.

3. Remaining Equipment Shortages and Modernization Shortfalls at the End of FY 2023

Aircraft recapitalization remains the USNR's number one equipment priority. *Table 1 Consolidated Major Item Inventory and Requirements* and *Table 8 Significant Major Item Shortages* provide a listing of the RC's projected on-hand equipment inventories and requirements through FY 2024.

D. Summary

Mission One for every Sailor—active and reserve, uniformed and civilian—is the operational readiness of today's Navy.[6] To this end, the USNR must continue to prioritize AC/RC compatibility and interoperability. Specifically, the Navy must recapitalize its RC aircraft at a rate that makes the RC force multipliers and operationally relevant. The USNR must modernize its capabilities to increase its effectiveness when called deploy and grow its investment in expeditionary logistics to support distributed maritime operations to provide maximum support to the fleet during strained military conflict.

The USNR remains ready to respond when called. In the face of great power competition, investment in a forward-looking, holistic Total Force mindset ensures the most effective and lethal reserve warfighting component possible.

[6] FRAGO 01/2019: A Design for Maintaining Maritime Superiority, December 2019.

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Table 1

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2021 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Aircraft							
Aircraft, Transport, C-40A (Boeing 737-700)	C-40A	$93,000,000	17	17	17	17	23
Aircraft, Transport, C-130T (Hercules)	C-130T	$64,200,000	19	19	19	19	19
Aircraft, Transport, KC-130T (Hercules)	KC-130T	$73,000,000	10	11	11	11	13
Aircraft, Transport, C-37A (Gulfstream)	C-37A	$71,100,000	1	1	1	1	1
Aircraft, Transport, C-37B (Gulfstream)	C-37B	$67,600,000	3	3	3	3	3
Aircraft, Patrol, P-3C (Orion)	P-3C	$36,000,000	7	3	0	0	0
Aircraft, Patrol, P-8A (Poseidon)	P-8A	$174,000,000	0	0	2	2	12
Aircraft, Electronic Attack, EA-18G (Growler)	EA-18G	$88,700,000	5	5	5	5	5
Aircraft, Fighter/Attack, F/A-18C (Hornet)	F/A-18C	$43,000,000	0	0	0	0	0
Aircraft, Fighter/Attack, F/A-18D (Hornet)	F/A-18D	$43,000,000	0	0	0	0	0
Aircraft, Fighter/Attack, F/A-18E (Super Hornet)	F/A-18E	$68,000,000	10	10	10	10	10
Aircraft, Fighter/Attack, F/A-18F (Super Hornet)	F/A-18F	$68,000,000	2	2	2	2	2
Aircraft, Fighter, F-5F (Tiger II)	F-5F	$21,700,000	2	2	3	3	3
Aircraft, Fighter, F-5N (Tiger II)	F-5N	$3,300,000	29	30	32	35	35
Aircraft, Fighter, F-16C Fighting Falcon	F-16C	$18,800,000	0	6	12	12	12
Helicopter, ASW, MH-60R (Seahawk)	MH-60R	$47,100,000	5	5	5	5	5
Helicopter, NSW, MH-60S (Seahawk)	MH-60S	$30,700,000	12	12	12	12	12
Helicopter, Mine Warfare, MH-53E (Sea Dragon)	MH-53E	$62,300,000	6	4	2	0	0
Aviation Simulators							
C-130T Simulator	C-130T SIM	$8,893,000	3	3	3	3	3
F-5 Simulator	2F213	$4,000,000	2	2	2	2	2
FA-18C Simulator	2F193A	$7,964,000	3	0	0	0	0
F-16C Simulator	F-16C SIM	$3,500,000	1	1	1	1	1
Naval Beach Group							
Maritime Prepositioning Force Utility Boat	MPF-UB	$1,000,000	10	10	10	10	10
Naval Beach Group Table of Allowance (TOA) Equipment	NBG	$26,705,722	1	1	1	1	1
Naval Construction Force (NCF)							
Construction Battalion Maintenance Unit TOA	CBMU	$14,507,560	2	2	2	2	2
Naval Mobile Construction Battalion TOA	NMCB	$88,223,834	5	5	5	5	5

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Naval Construction Regiment TOA	NCR	$14,685,716	2	2	2	2	2
Construction Capability Augment TOA	NCFCCA	$296,992,280	1	1	1	1	1
NAVCONTGRU Equipment	NCGEQP	$68,470,013	2	2	2	2	2
Maritime Expeditionary Security Force (MESF)							
Squadron TOA Equipment	CORIVGRUSQ	$16,832,037	4	4	4	4	4
MobileSecurity Company TOA	CORIV-CO	$2,465,769	16	16	16	16	16
MK VI Patrol Boat	MKVIPB	$14,247,672	6	6	6	6	6
Navy Expeditionary Logistics Support Group (NAVELSG)							
Navy Expeditionary Logistics Regiment TOA	NELR	$4,526,911	3	3	3	3	3
Navy Cargo Handling Battalion (Commercial) TOA	NAVCARGOBN (C)	$46,967,158	2	2	2	2	2
Navy Cargo Handling Battalion (Tactical) TOA	NAVCARGOBN (T)	$53,156,828	1	1	1	1	1

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Table 2

Average Age of Equipment

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Aircraft, Transport, C-40A (Boeing 737-700)	C-40A	11	
Aircraft, Transport, C-130T (Hercules)	C-130T	26	
Aircraft, Transport, KC-130T (Hercules)	KC-130T	31	
Aircraft, Transport, C-20G (Gulfstream)	C-20G	27	
Aircraft, Transport, C-37A (Gulfstream)	C-37A	18	
Aircraft, Transport, C-37B (Gulfstream)	C-37B	14	
Aircraft, Patrol, P-3C (Orion)	P-3C	36	
Aircraft, Electronic Attack, EA-18G (Growler)	EA-18G	9	
Aircraft, Fighter/Attack, F/A-18C (Hornet)	F/A-18C	28	
Aircraft, Fighter/Attack, F/A-18D (Hornet)	F/A-18D	28	
Aircraft, Fighter, F-5F (Tiger II)	F-5F	23	
Aircraft, Fighter, F-5N (Tiger II)	F-5N	40	
Helicopter, ASW, MH-60R (Seahawk)	MH-60R	7	
Helicopter, ASW, MH-60S (Seahawk)	MH-60S	11	
Helicopter, Mine Warfare, MH-53E (Sea Dragon)	MH-53E	29	
Aviation Simulators			
C-130T Simulator	C-130T SIM	29	
F-5 Simulator	2F213	10	
F/A-18C Simulator	2F193A	10	
Naval Beach Group			
Maritime Prepositioning Force Utility Boat	MPF-UB	9	
Naval Beach Group Table of Allowance (TOA) Equipment	NBG	5	
Naval Construction Force (NCF)			
Construction Battalion Maintenance Unit TOA	CBMU	12	
Naval Mobile Construction Battalion (NMCB) TOA	NMCB	12	
Naval Construction Regiment TOA	NCR	10	
Construction Capability Augment TOA	NCFCCA	13	
NAVCONTGRU Equipment	NCGEQP	13	
Maritime Expeditionary Security Force (MESFF)			
Squadron TOA Equipment	CORIVGRUSQD	14	
Mobile Security Company	CORIV-CO	14	
MK VI Patrol Boat	MKVIPB	5	
Navy Expeditionary Logistics Support Group (NAVELSG)			
Navy Expeditionary Logistics Regiment Staff TOA	NELRHQ	12	
Navy Cargo Handling Battalion (Commercial) TOA	NAVCARGOBN (C)	12	
Navy Cargo Handling Battalion (Tactical) TOA	NAVCARGOBN (T)	12	

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Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2022 would be expected to arrive in RC inventories in FY 2023 or FY 2024. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
FY 2019 NGREA Equipment			
F-5 Filthy Buzzard Pods	$14,055,000		
F/A-18 Filthy Buzzard Pods	11,243,000		
Force Protection Large / 40' Patrol Boats	9,600,000		
Tactical Communications Equipment	8,372,179		
Weapons Simulators	2,499,135		
HSC-85 MH-60S Equipment	3,890,573		
Cargo Handling Equipment	2,416,776		
Concrete Mixer	1,050,000		
C-130 Corrosion Correction Equipment	820,867		
MH-60R Link 16 Terminal Upgrade	773,624		
LCSRON Support Equipment	645,710		
F-5 Aircraft Protective Equipment	1,141,429		
C-40A Weather Radar Upgrade	172,433		
C-37A Safety Upgrades	191,000		
F-5 Block Upgrade	4,500,000		
F-5 Maintenance Support Equipment	2,301,333		
F-5 Avionics Upgrade	1,326,941		
Total	**$65,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

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Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty	Remarks
Aircraft, Fighter, F-5F	F-5F	0	+1	0	One Swiss F-5F expected FY23 delivery
Aircraft, Fighter, F-5N	F-5N	+1	+2	+3	Additional F-5s from Swiss buy.
Aircraft, Fighter / Attack, FA-18A	FA-18A	0	0	0	All As should be divested by end of FY21.
Aircraft, Fighter / Attackr, FA-18B	FA-18B	0	0	0	All Bs should be divested by end of FY21.
Aircraft, Fighter / Attack, FA-18C	FA-18C	-10	0	0	Current plans have all F-18C/Ds divested by the end of FY22.
Aircraft, Fighter / Attack, FA-18D	FA-18D	-2	0	0	Current plans have all F-18C/Ds divested by the end of FY22.
Aircraft, Fighter / Attack, FA-18E	FA-18E	+10	0	0	VFC-12 Transitions to 12 PAA Super Hornet Squadron.
Aircraft, Fighter / Attack, FA-18F	FA-18F	+2	0	0	VFC-12 Transitions to 12 PAA Super Hornet Squadron.
Aircraft, Fighter, F-16C	F-16C	+4	+8	0	VFA-204 will transition to 12 F-16Cs by the end of FY23.
Aircraft, Electronic Attack, EA-18G	EA-18G	0	0	0	VAQ-209 slated for steady state PAA 5
Aircraft, Transport, KC-130T	KC-130T	+1	0	0	Received from Marine Corps Reserve (3 received FY20, +2 planned FY21 + 1 FY22 = 6 total additional aircraft)
Aircraft, Patrol, P-3C	P-3C	-4	-3	0	Plan is support LSRS requirment through FY22 w/ full P-3 sundown scheduled for FY24.
Aircraft, Patrol, P-8A	P-8A	0	+2	0	VP-62 slated to transiton to P-8 FY23 w/ subsequent VP-69 transition pending budget increase of additional P-8 buy.
Aircraft, Transport, C-20G	C-20G	0	0	0	Will be divested by 31 JAN 2021. Last flight will be 01 Dec 2020 from SIG to AMARG.
Aircraft, Helicopter, MH-53E	MH-53E	-2	-2	-2	Navy plans to divest to of all MH-53 aircraft by the end of FY24.

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Table 6

FY 2018 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2018 with actual procurements and transfers. FY 2018 is selected as these are the most recent funds to expire. Because the procurement cycle is normally one to two years from funding to delivery, this table identifies only deliveries through the end of FY 2020. Procurement and NGREA columns reflect cost values in dollars.

Nomenclature	Equip No.	FY 2018 Transfers (# of items)		FY 2018 Procurements ($s)		FY 2018 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2018 Planned Transfers & Withdrawals							
Aircraft, Fighter / Attack, FA-18 A	F18A	0	-5				
Aircraft, Fighter / Attack, FA-18 B	F18B	0	-1				
Aircraft, Fighter / Attack, FA-18 C	F18C	-1	+21				
Aircraft, Fighter / Attack, FA-18 D	F18D	0	+6				
FY 2018 Service Procurement Programs – RC (P-1R) Equipment							
Other Aircraft							
KC-130J				$155,074,000	$497,774,000		
Modification of Aircraft							
Adversary Aircraft				2,565,000	2,565,000		
H-53 Series				4,619,000	4,619,000		
C-130 Series				19,923,000	140,923,000		
Cargo/Transport Aircraft (A/C) Series				10,075,000	10,075,000		
Other Procurement							
Standard Boats				2,097,000	0		
Construction & Maintenance				13,755,000	13,755,000		
Tactical Vehicles				1,861,000	1,861,000		
Items Under $5M - Civil Engineering Support Equipment				5,577,000	5,577,000		
C4ISR Equipment				840,000	840,000		
Physical Security Equipment				5,317,000	5,317,000		
FY 2018 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Force Protection Larqe/40' Patrol Boats						$9,312,000	$9,312,000
C-130T Carbon Brake Upqrades						8,861,603	11,200,654
NSW Operating Stock						7,385,730	598,050
Tactical Comms						5,759,709	6,834,709
F/A-18 Filthy Buzzard Pods						2,051,552	7,950,000
F5 Filthy Buzzard Pods						4,930,000	6,916,590
RQ-21A PUMA SURFR Payload Suite						3,600,000	4,645,985
RQ-20A PUMA SATCOM Data Support Terminals						3,084,000	0
C-40A Integrated Standby Flight Display						2,585,696	3,020,219
F-5 Radar Display Units						2,469,775	2,610,775
RQ-20A PUMA Small UAS						2,051,552	0
LSSV-Maintenance Truck						1,726,840	1,064,480
Standard Navy Double-Lock Recompression Chamber						1,509,650	1,509,650

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Table 6

FY 2018 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2018 Transfers (# of items)		FY 2018 Procurements ($s)		FY 2018 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
F/A-18 Simulator Visual upgrade						1,471,000	2,985,000
MH-60R VOR/ILS						1,414,000	926,421
LSSV-Litter Carrier Truck						1,079,200	952,920
FATS Trainers						984,735	984,735
Conflict Kinetics Synthetic Marksmanship Training Svstem						732,923	732,923
Undersea/Subsurface Remotely Operated Vehicle Suite						366,099	366,099
Mobile Training Suite						125,488	125,488
F-5 Radar							1,494,929
F-5 Avionics Upgrade							814,358
Total				**$221,703,000**	**$683,306,000**	**$61,501,552**	**$65,045,985**

USNR
Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is deployable in wartime. This data meets the Title 10 requirement to identify substitutes that are not the most desired equipment item.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No

Service Does Not Use Substitution to Satisfy Major Item Equipment Requirements.

USNR

Table 8

Significant Major Item Shortages

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	KC-130J	32	32	$87,700,000	$2,806,400,000	Procure 32 KC-130J aircraft to replace the aging and maintenance-intensive K/C-130T aircraft. The K/C-130T fleet is a crucial part of the Navy Unique Fleet-Essential Airlift (NUFEA) requirement. They serve as a connector between strategic airlift points, and they provide global logistics support while specializing in airlift for outsized cargo. Without recapitalization to KC-130J, K/C-130T readiness will continue to be extremely challenging.
2	Force Protection Large / PB40 Patrol Craft	96	69	$2,400,000	$165,600,000	Current Force Protection Large (FPL) 34FT Patrol boats (34PB) are fast approaching critical maintenance and service life issues, requiring ever increasing maintenance/CMAV/overhaul scheduling to meet mission requirements, increasing risk to personnel and readiness. 34PB boat service life is maximized - the Original Equipment Manufacturer (OEM) is no longer manufacturing 34PBs - they require replacement starting in 2019, with follow-on out-year procurement/acquisition strategy delivering complete replacement by 2025. The addition of the R/C HVU mission requirement increases the requirement for patrol boats. Currently 34PBs are being sourced from the R/C squadrons training allotment as well as suitable substitute patrol boats reactivated from NAVSEA's Boat Inventory Manager. 40PB is the designated replacement program for the aging 34PBs.
3	F-5 Block Upgrade	31	28	$3,500,000	$98,000,000	The Navy Reserve's fleet of F-5N/F aircraft are outdated, and the aircraft are scheduled to remain in service until 2035. These aircraft require significant modernization to their avionics and tactical systems to allow for safe and effective operation going forward. Modernization efforts include updated navigation systems, avionics, displays, a night vision device capability, a helmet-mounted cueing system, and a digital architecture that will allow for future modernization. There are currently 31 F-5N/F in the Navy Reserve. 11 additional aircraft will be procured from the Swiss over the FYDP, all of which already include the Block Upgrade modification.

USNR

Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
4	MH-60S Upgrades			Various	$5,545,000	External Gun Mount System (EGMS) for GAU-17 mini gun, M240D and GAU-21. The EGMS will move all Crew Served Weapon (CSW) system components (gun and ammunition can) external to the aircraft. The EGMS is necessary to mitigate potential cracking of the window frame which may be caused by the temporary window-mount. Moving the CSW systems outside the aircraft will provide more capacity for SOF personnel inside the cabin. It will also free-up cabin space for patient transfer during casualty evacuation operations. Cabin Radar Altimeter (RADALT) Display mounted in vicinity of the cabin door provides the crew-chief and rope-master the situational awareness of precise aircraft altitudes while deploying SOF during fast-rope insertions and overwater cast and recovery operations. The display will be tied to the aircraft's RADALT system, which will enable pilots and aircrewmen to observe the same altitude prior to troop deployment.
5	C-40A Inventory Completion	23	6	$93,000,000	$558,000,000	The requirement for the C-40A inventory is 23 aircraft as a result of a 2007 CNA study. Having 23 aircraft would allow the Navy Reserve to continue to provide unparalled flexibility to support worldwide fleet logistics operations as the demand for this capability only continues to grow fleet-wide. As the VRM concept becomes reality, their ability to deploy will be closely tied to the mobility afforded by the C-40 fleet and having a full complement of airplanes will be paramount to keep the carrier logistics force in place.
6	KC-130T Avionics Obsolescence Upgrade (AOU) Kits	30	6	$6,500,000	$39,000,000	24 of 30 Navy Reserve K/C-130Ts have funding to complete their Avionics Obsolescence Upgrade. 6 KC-130T aircraft received from the Marine Corps Reserve are not funded. AOU ensures the C-130 fleet attains international communications, navigation and safety standards. Without funding, the legacy K/C-130Ts will lag the K/C-130Ts receiving the upgrade, resulting in significant operational and safety limitations.
7	Improved Navy Lighterage System (INLS)	1	1	$40,000,000	$40,000,000	Naval Beach Group ROC/POE requires seven operational Improved Navy Lighterage System (INLS) sets on each coast at ACB-1 and ACB-2, and two training sets. However, only four INLS sets per coast were fielded with no dedicated training sets. INLS consists of 12 modules for four ferries, in a 4×3 arrangement where each ferry assembly comes with a Power section (with engine and controls), an Intermediate section, and a Beach section (with ramp). Procurement would allow for a training set for ACB-1 who has a 33/67 AC/RC mix.

USNR

Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
8	Force Protection Large Prime Mover	32	7	$232,000	$1,624,000	The current commercial Prime Mover for towing the legacy 34' Patrol Boats does not have the capacity to tow the newer and larger 40' Patrol Boats expected to enter service starting in FY21. The RC requires 32 Prime Movers to move these new 40' Patrol Boats. Current RC baseline funding in the FYDP is only sufficient to purchase 25 replacement Prime Movers. Seven additional Prime Movers are needed. A shortage of Prime Movers will have a negative impact on readiness and mobility, directly affecting the MESF's operational ability to meet global deployment requirements.
9	Crane Simulators	3	3	$1,200,000	$3,600,000	NAVELSG has the mission to rearm, refuel, and resupply the Fleet in austere environments. By the end of FY21, NAVELSG will be certified by PMA 280 to conduct Vertical Launch System (VLS) reload, a critical capability in the High End Fight. To meet the Fleet's requirements, NAVELSG has to train and be certified to operate four major types of cranes; Pedestal (permanently mounted cranes), Gantry (shipboard cranes that run on a track), 90 ton Mobile crane (wheeled or tracked cranes that can move independently) and Appleton (a family of maritime cranes found on a variety of ships to include Military Sealift Command (MSC)). NAVELSG does not currently have cranes in their Table of Allowance (TOA) and have to rely on crane rental or the availability of an MSC ship to conduct training. Reserve units do not have the equipment or time to build and sustain crane skills required to meet their Fleet missions.
10	P-8A Squadron Ground Support Equipment (GSE)	2	2	$4,540,000	$9,080,000	The Navy Reserve has been appropriated 11 P-8A aircraft, which allows for the recapitalization of two Reserve squadrons, VP-62 and VP-69. There is a significant amount of GSE required to transition these squadrons from P-3C to P-8A and allow them to perform routine maintenance, testing and diagnostics. Without this equipment, the squadrons will be unable to properly maintain their aircraft.

Chapter 5
United States Air Reserve Components

"Air dominance is not an American birthright. Without the U.S. Air Force's unprecedented control of the air and enabling domains, no other U.S. military mission enjoys full freedom on maneuver."

- General Charles "CQ" Brown, Chief of Staff of the Air Force

I. Department of the Air Force Overview

UNITED STATES AIR FORCE MISSION

Fly, Fight, and Win…in Air, Space, and Cyberspace

UNITED STATES AIR FORCE VISION

The World's Greatest Air Force, Powered by Airmen, Fueled by Innovation

UNITED STATES SPACE FORCE MISSION

The USSF is a military service that organizes, trains, and equips space forces in order to protect U.S. and allied interests in space and to provide space capabilities to the joint force. USSF responsibilities include developing military space professionals, acquiring military space systems, maturing the military doctrine for space power, and organizing space forces to present to our Combatant Commands.

A. Air Force Planning Guidance

In an environment that includes declining resources, aggressive global competitors, and rapid technology development and diffusion, the U.S. Air Force (USAF) must accelerate change to control and exploit the air domain while underwriting national security through nuclear deterrence to the standard the nation expects and requires. USAF has known for some time what it needs to change. The challenges described above, combined with the actions required to establish the U.S. Space Force (USSF), create a unique, limited window of opportunity to change. If USAF fails to adapt to the strategic environment, a large and growing body of evidence suggests that USAF risks losing great power competition, high-end fights, quality Airmen, its credibility, and the ability to secure the nation's future. To succeed, USAF must accelerate the changes that will ensure it remains the most dominant and respected Air Force in the world.[1]

The Department of Defense's (DoD's) lines of effort of building a more lethal force, strengthening and expanding global partners, and continuing to reform business practices are critical to responding to each of these global challenges.[2] To support these lines of effort, the USAF has outlined four strategic priorities. First, USAF must build the USSF. Second, USAF

[1] Accelerate Change or Lose, Gen Charles Q. Brown, dated August 26, 2020.
[2] Gen Charles Q Brown Advanced Policy Questions to Senate Armed Services Committee, dated May 7, 2020.

must modernize the air and space forces. Third, USAF must grow strong leaders and resilient families. Finally, USAF must strengthen alliances and help develop partner nations.[3]

DoD is assessing how to integrate the space functions of the Reserve Component (RC) into the USSF. As such, the Department has a unique opportunity to consider a clean sheet, 21st century approach to human capital management specifically designed for the unique USSF mission set.

The USAF has been working to align with the National Defense Strategy (NDS) for several years. In FY 2018, Congress helped the USAF recover from the damaging effects of sequestration and halt declining readiness across the force. Since the NDS and Nuclear Posture Review were released in 2018, the USAF has begun to align future conventional and nuclear forces design with the guidance in these documents. In FY 2019, USAF completed significant readiness recovery across multiple aircraft and spacecraft fleets and mission sets. The USAF also worked with Congress to make essential decisions on the Joint Surveillance Target Attack Radar System and the Overhead Persistent Infrared (OPIR) satellite system, setting the tone for future modernization. The plan for recapitalizing these platforms had to change as they would not have survived in future conflict given the emerging threats. Instead of developing large, vulnerable aircraft and satellite systems, the USAF pursued the Advanced Battle Management System and Next-Generation OPIR. These systems are essential to robust Joint All-Domain Command and Control (JADC2) and the networked future force. The USAF's FY 2020 budget submission was the first informed by and focused directly on 2018 NDS implementation. The demands this strategy placed on the USAF drove Congress to ask: What forces are required to successfully execute the NDS? The Air Force We Need study assessed the baseline capacity required to meet NDS objectives, assuming current capabilities and concepts, at medium risk based on Combatant Commander Operational Plans and Timelines. In addition to establishing this baseline, the USAF made key organizational changes to drive toward future capabilities and concepts. Significantly, the USAF helped launch the USSF, which now stands as an equal branch of the military.[4]

In preparation for the FY 2021 submission, the Department of the Air Force conducted an exhaustive portfolio review and made hard decisions to better align with the NDS. Some choices required investments in the future at the expense of legacy platforms. These choices accept calculated short-term risk to pursue the Secretary of Defense's goal of irreversible momentum toward NDS implementation. After conducting multiple, complex wargame scenarios to assess alternative warfighting approaches against a peer adversary, the USAF shared the results with Congress over the past year and talked openly about the implications for the USAF; the FY 2021 budget reflects this analysis of the USAF required for the future. To achieve the objectives of the NDS, the USAF will pursue an integrated design and field modernized forces that can

- connect the Joint Force and more seamlessly integrate as a Joint team,
- dominate Space by supporting the USSF,

[3] Secretary of the Air Force Barbara Barrett Remarks at Air Warfare Symposium, dated February 27, 2020.
[4] USAF Posture Statement, Fiscal Year 2021, dated March 3, 2020.

- generate Combat Power to blunt any attack against the U.S. or its allies, and
- conduct Logistics Under Attack to sustain high-tempo operations as long as necessary.

In each of these areas, the USAF will work with Congress, other U.S. services, industry, academia, allies, and partners to develop and field innovative solutions. While focusing on the four key investment areas above, the USAF will also continue to provide Combatant Commanders with Ready Forces to conduct Strategic Deterrence and Homeland Defense and to Counter Violent Extremism.[5]

B. Air Force Equipping Policy

A cornerstone to creating the Air Force required by the future is Active Component (AC) and Air Reserve Component (ARC) parity. For the USAF to be successful, AC and RC forces must be equivalent in terms of lethality and interoperability. The USAF will continue to adhere to the principle of proportional and concurrent fielding across the components, as seen in the F-35 and KC-46 programs. Accordingly, in advance of full integration, new equipment will arrive at ARC units simultaneously with its arrival at AC units in the proportional share of each component. The USAF has identified Air Force Policy Directive 10-3, *Operational Utilization of the Air Reserve Component Forces*, and subsequently Air Force Instruction (AFI) 10-301, *Managing Operational Utilization Requirements of the Air Reserve Component Forces*, as the appropriate implementation mechanism.

Additionally, the USAF published a revised AFI 90-1001, *Planning Total Force Associations (TFAs),* in June 2020. This document provides policy for planning Total Force Integration initiatives across all components of the USAF. TFAs optimize existing force structure to enable USAF component organizations to share resources to perform a common mission. Concurrent fielding and equipment modernization allows the USAF to maximize readiness of the force, increase lethality, and cost-effectively modernize.

C. Plan to Fill Equipment Shortages in the RC

The USAF equipping policy of concurrent fielding has left no major weapons system shortages in the ARC. Although it would be preferable to recapitalize legacy systems at a faster rate, the current plan of record leaves no units unequipped to contribute to the USAF mission.

The USAF seeks the optimal mix of operational forces across the Total Force to shift quickly and efficiently from one mission to another. It continually seeks to maximize the value of the RC, most notably through unit associations, fielding over 70 across the ARCs. Classic Associations provide access to a depth of personnel experience and surge capacity, whereas Active Associations provide access to iron and enable additional absorption within operations and maintenance.

D. Initiatives Affecting RC Equipment

The USAF has initiatives under way to consolidate recruiting under the Total Force umbrella to better capture and retain talent across the service. Additionally, through the Director of Staff

[5] Ibid.

Integration Office, the USAF is closely monitoring its force structure and integration efforts to assess possible savings, redundancies, and areas to capitalize readiness improvements.

In building a force capable of JADC2, the USAF proposed future investments that are balanced by divesting legacy assets. Investing in this budget will change some units' missions, including the RC. Aircraft type or mission changes will require new skills, but the USAF is committed to retaining and retraining personnel as it adjusts capabilities. The USAF is also expanding efforts to ease transitions from Active to Reserve and Guard components, allowing increased flexibility along a continuum of service. Even with changing aircraft or missions, there are no plans to inactivate any wings at this time.[6]

E. Plan to Achieve Full Compatibility between AC and RC

The message of the NDS is crystal clear: a more lethal, resilient, and rapidly innovating Joint Force, combined with a robust constellation of allies and partners, will sustain U.S. influence and ensure favorable balances of power that safeguard the free and open international order. Failure to meet these defense objectives will decrease U.S. global influence, erode cohesion among allies and partners, and diminish military advantage.

To align with this direction, the USAF is putting forward an aggressive budget based on a new blueprint for joint warfighting. Joint All Domain Operations and the command and control networks required to connect the joint team form the centerpiece of this strategy. To achieve the vision of the NDS, the joint force must fight together and deliver all-domain capabilities in a way that overwhelms adversaries and acknowledges that all global military operations are connected to and rely on a safe, secure, and effective nuclear arsenal. The USAF appreciates Congress' support with on-time budgets and the willingness to take prudent near-term risk to build a winning, networked force of the future. With this budget, the USAF makes significant contributions to achieving irreversible momentum toward implementing the NDS.[7]

The USAF already faces increasing budget pressure based on the growing costs of sustaining current and aging force structure, continuous combat operations, and long deferred modernization. While previous decisions were made with the best of intentions and reflected perceived needs at the time, in aggregate, they do not deliver the outcomes required today because of the rapidly changing elements of competition with China and Russia. Learning from prior recapitalization and modernization plans, the USAF must frame decisions with an enterprise-wide perspective.[8]

[6] USAF Posture Statement, Fiscal Year 2021, dated March 3, 2020.
[7] Ibid.
[8] Accelerate Change or Lose, Gen Charles Q. Brown, dated August 26, 2020.

II. Air National Guard (ANG) Overview

A. Current Status of the ANG

1. General Overview

Top ANG Equipment Focus Areas

- F-16 Active Electronically Scanned Array Radar Test & Initial Fielding
- C-130H Propulsion Improvements
- C-130J Support Equipment
- Mobile/Deployable Remotely Piloted Aircraft Detect & Avoid Capability

"Today's National Guard plays a vital role in the security and welfare of our nation. On any given day, approximately 30,000 Guardsmen carry out federal missions around the world, and an additional 10,000 Guardsmen conduct state and federal missions within the U.S. and its territories. National Guardsmen are part of an operational force nearly 450,000 strong that provides strategic depth to our nation's Army and Air Force."[9]

The Chief, National Guard Bureau's (CNGB's) vision is focused on supporting the NDS while accomplishing three core missions: Warfight, Homeland, and Partnerships. These missions are achieved by dedicated efforts centered on three priorities: (1) Readiness; (2) People, Families, and Employers; and (3) Innovation. A modernized ANG that is "Ready for Today's Fight" is a critical enabler of the Chief's readiness priority. The ANG utilizes resources provided to ensure its force is deployable, sustainable, and interoperable with the Air Force at all times—*yet more can be done*. The ANG will remain a force in transition as "21st Century Guard Airmen" train for and execute new missions with modernized and recapitalized combat capability—*the ANG strengthens the total force by fulfilling new mission requirements alongside its Active Duty counterparts.* Finally, the ANG will never stop "Building for Tomorrow's Fight," ensuring it is a resilient and lethal operational reserve—*it requires well-developed and exceptional leaders focused on ensuring the ANG is a central component to America's security and future.*

2. Current Status of Equipment

ANG support equipment and vehicle inventory fill-rate is 92 percent and 94 percent respectively. These rates have remained at or above 90 percent for the past three reporting periods.

a. Equipment On-hand

Table 1: Consolidated Major Item Inventory and Requirements provides projected RC inventory of major items including air refueling, air support, airlift, fighter, and rescue aircraft.

b. Average Age of Major Items of Equipment

The average age of ANG aircraft is 25 years old, ranging from an average of 61 years old for the KC-135T fleet to an average of 1 year old for the F-35. Support equipment for sustaining ANG aircraft remains a challenge. Original manufacturers no longer produce some support items or are no longer viable, increasing maintenance costs. See *Table 2: Average Age of Equipment* for the average age of major equipment items as of the start of FY 2021.

[9] Written statement of Gen Joseph L. Lengyel, Senate Appropriations Committee, Subcommittee on Defense, March 4, 2020, p.1.

c. Compatibility of Current Equipment with AC

The ANG is focused on readiness as the NDS demands more lethality from the military. This readiness requires the ANG to be deployable, sustainable, and interoperable with the active components. Enhancing full-time support and replacing and upgrading dilapidated facilities are vital in that regard. The ANG also requires parity in equipping its force through concurrent and balanced modernization and recapitalization so that it can deliver the lethality required to the joint force. With continued congressional funding, the ANG will be able to maintain compatibility with the AC.

d. Maintenance Issues

The ANG continues to operate and maintain the oldest aircraft in the USAF inventory, and faces significant challenges to increasing aircraft availability. Aircraft support and test equipment are critical to daily maintenance operations at all ANG flying units. **Much of the equipment used in testing aircraft systems is nearing the end of its designated useful life and is increasingly difficult to sustain and expensive to repair.** The ANG functions at a prolonged high operations tempo, driving the need for efficient maintenance processes and robust supply chains. Devices enhancing maintenance efficiency and safety while improving capabilities also improve aircraft availability, reduce operating costs, and enhance agile combat support. State of the art equipment such as the maintenance inspection platforms, maintenance cranes, and digital test equipment reduces aircraft downtime, allows logistics personnel to maintain a high rate of sortie generation, and ensures the longevity, relevance, reliability, and responsiveness of the aging fleet. The ANG Weapon Systems Sustainment Working Group outlined the following maintenance concerns regarding legacy system sustainment and shortfalls.

Support and Test Equipment: Currently, the ANG relies on outdated test equipment to sustain an aging fleet of aircraft that frequently breaks and incurs high maintenance costs. This has a direct impact on aircraft availability. Updating to digital replacements for test equipment items will enable maintenance personnel to troubleshoot and repair aircraft in a fraction of the time required by older methods.

While some support equipment modernization has been completed in recent years, the majority of aircraft support equipment was designed and built in the 1970s and 1980s and is not on par with current technology. Legacy equipment remains labor-intensive and costly to operate, regularly presenting significant safety concerns. The ANG continues to explore innovative solutions to these challenges by working with industry partners to find off the shelf solutions that consolidate multiple functions, are more efficient to operate, and enhance maintenance efficiency and safety.

Isochronal (ISO) Maintenance and Inspection Stands and Cranes: ANG lacks the necessary C-17 maintenance inspection stands to perform required inspections and maintenance. The first C-17 ISO Maintenance Stand was delivered in May 2018 with four additional stands to be delivered in the future. Inspection stands are also under the Statement of Work for ANG's C-40 unit. ANG's KC-135 and E-8C inspection stands, which average 31 years of age, no longer meet Air Force Occupational Safety and Health or Occupational Safety and Health Administration

standards. ANG units have received the first nine deliveries of ANG KC-135 ISO Maintenance Stands, resulting in an average of five days saved during ISO Maintenance Inspections. Three more sets of stands will be delivered in the near future. Delivery of E-8C ISO Maintenance Stands has been completed. To meet outstanding requirements, the ANG needs to purchase four new C-17 stands and one C-40 inspection stand totaling $18.5 million to alleviate unnecessary risk, allow maintainers to focus on aircraft specific tasks, and provide a safe working environment. In addition to maintenance stands, current crane/hoist/sling capabilities are insufficient in ANG KC-135 units. New KC-135 maintenance cranes would reduce risk of personnel injury or equipment damage during heavy maintenance requirements and substantially decrease maintenance repair times, increasing aircraft availability and Mission Capable rates.

e. Aircrew Flight Equipment (AFE) Sustainment Issues

As the only maintenance type function located within the Operations Group, AFE is caught between funding lines and often left off budget requests. Major programs listed below such as F-15, F-16, and A-10 are getting upgraded 3-D audio and Joint Helmet-Mounted Cueing Systems that fall directly into AFE management once procured. As a result, AFE is left with the burden of sustaining this equipment. As more AFE-serviced items become local purchase, Cost per Flying Hour funds for local purchase to support the flying squadrons are becoming limited.

Aircrew Chemical Defense is AFEs largest program across all manned aircraft. This program directly ties to the readiness rating of these units within the ANG Enterprise. This program has historically been underfunded both for direct funding from the Program Element and for sustainment funding. The lack of funding affects readiness and the ability of the ANG to support CNGB goals.

The severity of the struggling Aircrew Chemical Defense program is highlighted by the ANG's use of the Defense Property Accountability System (DPAS), which the ANG calls the Aircrew Flight Equipment Resource Management System. DPAS allows for accurate tracking of proper stock of equipment. Rather than relying on data calls for expiring equipment, NGB is able to track expired items across the enterprise for the current year and 6 years forward. With the specialized Aircrew Chemical Defense equipment shortages, this is an example of an innovative way to ensure aircrew readiness is properly sustained.

With the increased highlight of the AFE program shortfalls in all areas, the creation of a standalone NGB AFE PE is under consideration. This would allow for dedicated funding to sustain the programs and ensure alignment with CNGB-stated priorities.

f. Modernization Programs and Shortfalls

ANG has documented $12.5 billion in critical capability shortfalls through its Air Reserve Components (ARC) Weapons and Tactics Council (WEPTAC) and ANG Domestic Capability Priorities (DCP) programs. Because of these acute shortfalls, ANG modernization programs use innovative acquisition strategies to build a more lethal force for the war fight and homeland and provide up-to-date equipment for first responders during domestic emergencies. The annual ARC WEPTAC and DCP Conferences remain the starting points for ANG modernization efforts.

The reprogramming of FY 2020 National Guard and Reserve Equipment Appropriation (NGREA) funds necessitated reallocation of funding among the FY 2018 and FY 2019 NGREA programs to ensure no contracts were breached, programs were completed when possible, and the most critical programs were funded to a level to bridge to potential FY 2021 funding.

At the 2020 ARC WEPTAC, held virtually, field operations, maintenance, and support experts ANG-wide identified and vetted critical shortfalls collaboratively with headquarters staff–level functional area managers. The process included review of command and control (C2); cyber; intelligence, surveillance, and reconnaissance (ISR); training; and simulator systems as well as weapons delivery, airlift, and tanker platforms. These capability shortfalls are documented in the annual Weapons Systems Modernization Priorities book. **The 2020 Modernization Book documented an $11.9 billion shortfall for modernization and recapitalization of the ANG aircraft fleet and associated equipment. The top three modernization priorities for 2022 remain: Active Electronically Scanned Array (AESA) radar modernization for the F-16 and F-15; C-130H propulsion modernization; and acquisition of C-130J Support Equipment.**

The DCP Conference identifies and prioritizes capability shortfalls for federal and non-federal support of civil authorities during a domestic emergency. The conference is organized by functional areas to mirror the Federal Emergency Management Agency's Emergency Support Function framework and aligns requirements with the CNGB's core capabilities. The output from this conference is published in the annual ANG DCP Book. The 2020 DCP book identified $562 million in capability priorities. The DCP in the Spring of 2021 will follow the same model as the ARC WEPTAC, with the majority of the working groups meeting virtually.

The ANG Modernization Book and the Domestic Capability Priorities Book, available at http://www.ang.af.mil/Home/ANG-Priorities-Books/ANG, illustrate how ANG has leveraged NGREA to modernize 30 weapons systems and mission areas and to procure equipment for ANG domestic operations (covering 11 of 15 Emergency Support Functions). Priorities for future modernization include: aircraft sensors, legacy cockpit upgrades (communications/ datalink), aircraft defensive system upgrades, simulators, and Special Warfare equipment. Priorities for equipment supporting domestic operations include equipment for first responders; command and control equipment; emergency mobile medical facilities; Chemical, Biological, Radiological, Nuclear, and High-yield Explosives response equipment; and urban search and rescue equipment.

The following paragraphs highlight the modernization efforts undertaken by the ANG, and some of the critical shortfalls, arranged by mission type with individual associated weapons systems broken out in detail.

g. Combat Aircraft

A-10C: The ANG's 85 A-10C aircraft provide 32 percent of the total Air Force fleet and are the premier close air support aircraft. ANG aircraft have the helmet-mounted integrated targeting modification, drastically reducing the time required to acquire targets. This ultimately increases survivability and lethality. ANG A-10 aircraft are equipped with two ARC-210 radios, giving

them a unique capability to simultaneously communicate via secure line-of-sight and beyond-line-of-sight, extensively contributing to combat search and rescue (CSAR) mission success. One A-10 modernization priority is a high-resolution center display that shows pilots the high-definition picture provided by targeting pods, improving A-10 pilots' ability to positively identify friendly forces while aiding in search, identification, surveillance, and tracking of enemy personnel. Additional upgrades include an integrated, noise-cancelling, three-dimensional (3-D) cockpit audio system, and an anti-jam embedded Global Positioning System (GPS).

- Total Unfunded Modernization Shortfall: $115.5 million
- High Resolution Display Systems (HRDS): Installs a more capable system that enables full utilization of targeting pod improvements, enabling visual identification of friendly and enemy forces from greatly increased standoff ranges—$54 million shortfall; 3-year fielding timeline if fully funded.
- Second Gigabit Ethernet Switch: Installs a system that expands Ethernet capability to 22 ports to support the requirements for the HRDS upgrade—$8.9 million shortfall; 2-year fielding timeline if fully funded.
- Conversion Fuel Tank: Modifies current excess F-15 external fuel tanks to improve range, loiter time, and G-rating—$6.1 million shortfall; 3-year fielding timeline if fully funded.
- 3-D Audio: Installs a noise-cancelling system that increases situational awareness by spatially separating aural warning and radio signals, providing angular cueing to ground and air threats—$14.5 million shortfall; 3-year timeline if funded.
- Selective Availability Anti-Spoofing Module Embedded GPS/Inertial Navigation System: Installs a system that will improve navigational accuracy in a GPS-denied environment—$32 million shortfall; 3-year timeline if funded.

F-15C: The F-15C Eagle has been the backbone of the nation's Air Superiority fleet for over 30 years and will continue to be a key asset. The ANG's 137 F-15C/D aircraft provide 58 percent of the F-15C/D fleet, and CONUS units provide 31 percent of the Nation's Aerospace Control Alert assets, spanning five alert sites and providing 24-hour homeland defense. Modernization and sustainment programs are vital to improve aircraft capabilities for overseas contingency operations and homeland defense. These upgrades recapitalize and repair long-range combat identification and air superiority kill chains, while drastically increasing survivability in contested environments. These programs include the AESA radar, multi-spectral search and track technologies, electronic warfare and self-protection, a modern integrated cockpit, and next generation air-to-air weapons technology. The Air Force identified and validated defensive shortfalls in the F-15C Electronic Warfare (EW) capability. Previous efforts to modernize the EW system were cancelled, leaving the F-15C with no current or planned EW systems. All F-15 pilots were provided with Digital Eye Pieces, which provide Joint Helmet Mounted Cueing System information during operations using night vision goggles. These were partially funded with NGREA. Modernization efforts are underway to increase vehicle interoperability with 5th Gen platforms and to increase pilot safety.

- Total Unfunded Modernization Shortfall: $349.7 million

- APG-63v3 AESA Radar: Upgrading obsolete Mechanically-Scanned Array radars to modernized AESA radars provides combatant commanders critical air superiority and homeland defense capability, and remains the first priority for modernizing all ANG F-15C/D aircraft. There are currently 18 aircraft unfunded—$78 million shortfall not funded in the future years defense program (FYDP); 3-year fielding timeline if funded.
- Advanced EW Capability: Modernized EW is required to operate within combat theaters of operation. Current funding is for testing and initial article purchase—$85.7 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Infrared Search & Track (IRST): IRST provides the F-15C with an advanced target detection capability. Current efforts leave the program of record unfunded by 52 planned systems—$120 million shortfall, not funded in the FYDP; 3-year timeline if funded.
- Cockpit Modernization: The F-15C cockpit requires modernization to fully capitalize on network-centric operations and increase safety—$66 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Next Generation Air-to-Air Weapon: ANG F-15s require the replacement of legacy air-to-air weapons to maintain the tactical advantage of the ANG air superiority fleet. Current missile development is underway but integration on the F-15 is not yet funded. This effort will ensure integration efforts are executed in future software upgrades of the F-15—$50 million shortfall is not funded in the FYDP; 3-year timeline if funded.

F-16: The ANG's 332 F-16C/D aircraft provide 37 percent of the total Air Force fleet and fulfill many of Allied Air Command's precision-guided munitions and close air support taskings, including convoy escort, dedicated infrastructure defense, border patrol, and raid support. ANG aircraft also makeup 56 percent of the nation's Aerospace Control Alert fighter force. Modernization efforts are underway to improve ANG F-16s by fielding affordable systems with secure line-of-sight and beyond line-of-sight communication suites, smart displays with data processing capability, advanced helmet-mounted target cueing for air and ground weapons employment, enhanced self-protection suites, and improved radar performance and reliability.

- Total Unfunded Modernization Shortfall: $1.43 billion
- AESA Radar: AESA radars provide the capability to detect and track multiple airborne targets of interest in dense civilian air traffic environments. AESA radars will improve the capability of ANG F-16s to perform close air support, surface attack, and defensive counter-air—$650 million shortfall not funded in the FYDP; 5-year timeline if funded.
- ALR-69A Digital Radar Warning Receiver: The Digital Radar Warning Receiver will reduce the operational risk for F-16s operating near advanced threat systems, resulting in access to areas previously denied and increasing pilots' ability to survive and accomplish assigned missions—$275 million shortfall not funded in the FYDP; 5-year timeline if funded.
- Missile Warning System (MWS): An MWS will increase ANG F-16s' survivability in highly contested and degraded areas of operation—$80 million shortfall not funded in the FYDP; 4-year timeline if funded.

- Link-16 Datalink: Link-16 will provide the capability to effectively employ in the current operational environment by allowing seamless deployment, connectivity, and interoperability for the entire ANG F-16 fleet—$65 million shortfall not funded in the FYDP; 3-year timeline if funded.

h. Mobility Aircraft

With a legacy lasting over 63 years, the C-130 Hercules still remains the U.S. Military's primary combat delivery aircraft. In addition to its primary role in tactical airlift, ANG C-130s support humanitarian, peacekeeping, and disaster relief operations. Procurement efforts continue to address needed updates to the avionics suites, propulsion modernization, improved self-protection, single-pass precision airdrop, and enhanced situational awareness. These improvements ensure that the ANG C-130 fleet remains capable of safely and effectively executing its missions globally and maintains relevancy in tomorrow's fight.

C-130H: The ANG's 115 C-130H aircraft provide 67 percent of the total Air Force fleet. C-130H aircraft safety and compliance requirements are being addressed via the Avionics Modernization Program, Increments 1 and 2. Upgrades include Communication, Navigation, and Surveillance/Air Traffic Management, Automatic Dependent Surveillance-Broadcast, and a digitized glass cockpit. Increments 1 and 2 are fully funded and on contract for all ANG C-130Hs.

- Total Unfunded Modernization Shortfall: $2 billion
- The C-130H fleet is bringing performance and fuel savings initiatives to production with a 3.5 engine upgrade, while digitizing the electronic propeller controller system (EPCS) and upgrading propeller performance to a modernized, high performance eight-bladed propeller (NP-2000). Thanks to congressional adds, EPCS is fully funded for all ANG C-130Hs, and 28 ANG C-130Hs are funded for the 3.5 engine and NP-2000 upgrades. This is one of the top three priorities for the ANG. The NP2000 and 3.5 engine programs still have a $954 million shortfall not funded in the FYDP; 5-year timeline if fully funded.
- The ANG C-130H fleet requires a common carry open-architecture mission pod capable of producing mission enhancement effects in contested environments. Mobility Air Forces (MAF) C-130H aircraft have inadequate missile-launch detection and inadequate ability to detect, degrade, and defeat infrared (IR) man-portable air defense systems (MANPADS). The Block 30 AN/AAQ-24 Large Aircraft IR Countermeasures (LAIRCM) system improves detection against advanced MANPADS threats and degrades the enemy's ability to engage C-130H aircraft. To survive in modern combat, C-130H aircraft require a radar warning receiver (RWR), with geolocation ability, capable of processing signals in a dense radio frequency (RF) environment that automatically directs countermeasures to defeat those threats—$841 million shortfall not funded in the FYDP; 5-year timeline if funded.
- The ANG C-130H fleet requires avionics modernization. The C-130H faces severe sustainment challenges with current avionics and cockpit instrumentation, and will be out of compliance with the Communications, Navigation, and Surveillance/Air Traffic Management 2020 mandate if not modernized. Additionally, tactical night operations continue to suffer

with lighting that is not night vision imaging system (NVIS)–compliant. To eliminate critical sustainment issues caused by diminishing manufacturing sources and material shortages (DMSMS) this modernized cockpit will include a multifunction engine instrument display system (EIDS), automatic dependent surveillance-broadcast (ADS-B), NVIS compatibility, and modern flight management system with GPS approach and polar navigation capabilities. An NVIS-compatible and modernized glass cockpit with a digital overhead panel reduces crew workload, lowers maintenance costs, and increases capability and sustainability to operate safely at night. The $57 million shortfall is not funded in the FYDP; 5-year timeline if funded.

- The ANG C-130H/J fleet requires the ability to accurately deliver airdrop loads in combat in both instrument and visual meteorological conditions. The U.S. Army's objective for airdrop accuracy is 50 meters circular error average, but traditional methods only provide 300-meter accuracy. Current precision airdrop methods require multiple passes over the drop zone, increasing exposure to threats. The $154 million shortfall is not funded in the FYDP; 5-year timeframe if fully funded.

C-130J: The ANG's 20 C-130J aircraft provide 13 percent of the total Air Force fleet and support not only its wartime mission, but also peacekeeping, humanitarian, and disaster relief operations. While the C-130J is the newest addition to the combat delivery fleet, it still requires incremental modernization to ensure fleet viability throughout its useful life.

- Total Unfunded Modernization Shortfall: $330 million
- C-130J Support Equipment: Provides support equipment and initial spares for C-130J ANG units receiving congressional adds of C-130Js. The congressional adds did not include funding for support equipment or spare parts—$58 million shortfall unfunded in the FYDP; 2-year timeline once funded.
- The C-130J requires a common carry open architecture mission pod capable of producing mission enhancement effects in ever-changing contested environments. The common carry pod will include self-protection and will be designed to accept future enhancements to protect the aircraft from emerging threats. To increase operational effectiveness in a hostile environment, the C-130 community has identified Large Aircraft Infrared Countermeasures Block 30 as the most effective measure against man-portable air defense systems. To counter radar threats, the C-130J requires an upgraded digital RWR (ALR-69A) to defeat current and future radar threats—$93 million shortfall unfunded in the FYDP; 5-year timeline once fully funded.
- ANG C-130Js require integrated battlespace awareness in the form of Real Time Information in the Cockpit (RTIC). RTIC with Link-16 provides a tactical data link (TDL) to ensure the C-130J fleet has access to the common operating picture. RTIC is vital for sending and receiving threat information beyond line-of-sight. Additionally, RTIC and self-protection systems need a fusion mechanism to effectively display ground- and air-based threats (Advanced Integrated Electronic Combat Suite). The RTIC system will be the baseline for Single Pass Precision Air Drop implementation to increase the accuracy and delivery of

personnel and equipment during airdrop operation—$154 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.

- C-130J aircrews require the ability to train in a GPS denied/degraded environment. A deception-based GPS jamming option is required to accurately reflect scenarios that are not simply GPS denied environments—$2 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- The C-130J requires the real-time in-cockpit situational awareness system for 28 aircraft, including the EC/MC-130Js. Upgrades to the hardware/software provide an airborne dynamic re-tasking capability and an integrated processor that will improve operational effectiveness—$23 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.

LC-130H: Of the 10 total LC 130s, the ANG owns six and operates the additional four aircraft owned by the National Science Foundation (NSF). The LC-130H operates on snowfields in remote areas of the Polar Regions in support of the NSF. The ANG LC-130H fleet requires updated avionics to ensure continued global airspace access. LC-130Hs face severe sustainment challenges with current avionics and cockpit instrumentation, and will be out of compliance with Communications, Navigation, and Surveillance/Air Traffic Management (CNS/ATM) mandates if not modernized. Additionally, tactical night operations continue to suffer without NVIS-compliant lighting. To eliminate critical sustainment issues caused by DMSMS and to meet required mandates and AFIs, this modernized cockpit will include a multifunction EIDS, automatic dependent surveillance-broadcast capability, NVIS compatibility, and a modern flight management system with GPS approach and polar navigation capabilities. Updated avionics address CNS/ATM mandates and increase operational efficiency by opening up airspace routes with stringent navigational requirements and allowing the use of GPS approaches.

- Total Unfunded Modernization Shortfall: $19.4 million
- ANG LC-130Hs require a robust, secure TDL. TDL provides a C2 link and maximizes aircrew situational awareness with beyond line-of-sight capabilities—$2.2 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- RTIC. RTIC with Link-16 provides a TDL, to ensure the C-130J fleet has access to the common operating picture. RTIC is vital for sending and receiving threat information beyond line-of-sight—$6 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- The LC-130 is part of the current Air Force C-130H avionics update program and the ANG continues to emphasize the importance of this program so it will receive priority on the upgrade schedule and ensure the aircraft can meet its mission requirements. The program is funded for the ANG's LC-130s. The NSF-owned aircraft are not currently funded and will require $11.2 million to complete the program.

C-17: The 50 ANG C-17s provide 23 percent of the total Air Force C-17 fleet. The ANG C-17 fleet requires a common carry open-architecture mission pod capable of producing mission enhancement effects in ever-changing contested environments. The C-17 fleet does not currently have an on-board capability to detect or defend against electronic threats. The majority of

missions flown by ANG C-17s are in areas posing a significant electronic threat with no dedicated off-board assets to provide detection or protection. To survive in modern combat, C-17 aircraft require an RWR capable of processing signals in a dense radio frequency environment that automatically directs countermeasures to defeat those threats. This capability enables C-17s to detect and defend against electronic threats in the likely scenario that the aircraft is operating independently.

- Total Unfunded Modernization Shortfall: $659 million
- The C-17 requires a common carry open architecture mission pod capable of producing mission enhancement effects in ever-changing contested environments. The common carry pod will include radio frequency self-protection and will be designed to accept future enhancements to protect the aircraft from emerging threats. To increase operational effectiveness in a hostile environment, the C-17 community has identified Large Aircraft Infrared Countermeasures as the most effective measure against man-portable air defense systems. To counter radar threats, the C-17 requires an upgraded digital RWR to defeat current and future radar threats—$356 million shortfall unfunded in the FYDP; 5-year timeline once fully funded.
- ANG C-17s require secure airborne data communications with other aircraft, C2 agencies, and ground-based forces. The MAF mission computer data link and data transfer capabilities provide aircrew the ability to report and receive battlespace information such as the position of other aircraft, weather, threat, mission events, mission status, task completion, and resource status. This increased situational awareness allows C2 agencies to track mission progress and facilitate rapid decisions and adjustments during mission execution. These improvements include an integrated data link, upgraded satellite communications, and an electronic flight bag—$102 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.
- ANG C-17s require onboard capability to access secure and unsecure internet data. While operating globally, aircrews require both tactical and strategic situation awareness provided by a secure high-speed global data system—$80 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- ANG C-17s require an electro-optical/infrared sensor to identify and track both friendly and enemy forces and properly identify and clear drop zone and landing zone areas and transmit the imagery to supporting forces as required—$51 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.
- C-17s require a synthetic vision capability in the head-up display to increase the tactical advantage of the C-17 during periods of night and instrument conditions—$70 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.

C-40: The ANG's three C-40C aircraft provide 21 percent of the fleet and provide worldwide distinguished visitor transportation for Congressional, Department of Defense (DoD), Air Force and National Guard missions. The primary mission of the C-40 is to ensure passenger safety and comfort while providing the utmost in reliability.

- Total Unfunded Modernization Shortfall: $21.5 million
- To enhance C-40 employment capabilities during worldwide operations, ANG C-40Cs require a high-speed data system for seamless, worldwide satellite-based communications and internet connectivity to enable the C-40C fleet to meet time-critical and persistent passenger mission requirements—$20 million shortfall unfunded in the FYDP; 2-year timeline once fully funded.
- ANG C-40s were delivered in the early 2000s and are in need of refurbishment. The custom seats are no longer produced and are not supported by the original manufacturer. 201st Maintenance is no longer able to repair every seat and aircraft have been dispatching on missions with inoperative seats. Additionally, the carpets, bulkheads, sidewalls, and bathrooms are in need of an updated Supplemental Type Certificate (STC). A cabin refresh with a new or amended STC is required across the C-40C fleet—$13.5 million shortfall unfunded in the FYDP; 2-year timeline once fully funded.

KC-135: The KC-135 Stratotanker is Air Mobility Command's primary air refueling platform providing approximately 87 percent of air refueling in support of U.S., allied, and coalition military aircraft. The ANG's 164 KC-135 aircraft provide 44 percent of the total Air Force fleet. The KC-135 is tasked to operate close to high-threat areas. Defensive systems are necessary to prevent shoulder-fired surface-to-air missile systems from destroying aircraft during takeoff, landing, and in low altitude flight over mountainous terrain. TDL technologies and situational awareness displays that bring real-time threat information, as well as secure radio capability, greatly enhance KC-135 air refueling, airlift, and aeromedical evacuation missions.

- Total Unfunded Modernization Shortfall: $596 million
- The KC-135 requires a common carry open architecture mission pod capable of producing mission enhancement effects in ever-changing contested environments. The common carry pod will include radio frequency self-protection and will be designed to accept future enhancements to protect the aircraft from emerging threats—$174 million shortfall unfunded in the FYDP; 5-year timeline once fully funded.
- To safeguard against man-portable air defense systems, the ANG is leading the integration of the LAIRCM system. All 164 ANG KC-135s will be modified with Group A wiring and 38 LAIRCM Group B pods will be procured—$199 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.
- RTIC situational awareness system will provide a baseline for future growth to establish the KC-135 as a data relay platform when equipped with Link-16 and TDL. RTIC was successfully demonstrated and is currently on contract to modify 164 ANG KC-135s—$165 million shortfall unfunded in the FYDP; 4-year timeline once fully funded.
- ANG KC-135s require cockpit and cabin cooling during ground and low-level operations. Temperatures at deployed locations routinely result in cockpit temperatures of 140° F and cargo compartment temperatures of 170° F. Aircrews generally spend more than 1 hour in these conditions, which is not conducive to mission accomplishment. Ground cooling carts are the primary method for temperature reduction. Ground cooling carts are removed before

engine start and are not usable if mission delays occur. Roll-on/roll-off vapor cycle air conditioning units placed onboard can provide ground cooling—$7 million shortfall unfunded in the FYDP; 2-year timeline once fully funded.

- ANG KC-135s require an automated hardened position, navigation, and timing (PNT) system integrated into the existing navigation equipment. ANG KC-135s fulfill almost 70 percent of the nuclear refueling mission. KC-135s require the ability to navigate oceanic airspace in a post-strike environment where traditional navigation aids and satellites are not available. Astro-inertial navigation systems provide the greatest accuracy and a bounded position error over an extended use-time and distance. These systems are autonomous, passive, non-jammable, and automatic. All 164 ANG KC-135s require automated, hardened PNT systems—$37 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- ANG KC-135s require portable aircraft-powered ground transfer fuel pumps to onload/offload fuel in an adaptive basing scenario or forward deployed environment where ground support is unavailable. This capability provides combatant commanders with greater flexibility staging KC-135s during contingency operations, natural disasters, and humanitarian support operations—$13.6 million shortfall unfunded in the FYDP; 2-year timeline once fully funded.

i. Rescue and Special Operations Aircraft

HC-130J: The ANG's 12 HC-130J aircraft provide 34 percent of the total Air Force fleet. The HC-130 is the rescue mission variant of the C-130. ANG HC-130 units continue to deploy in support of overseas contingency operations and provide emergency rescue and relief support during domestic operations. The ANG is finishing recapitalization of the HC-130P/N fleet and transitioning to the HC-130J.

- Total Unfunded Modernization Shortfall: $343 million
- Joint TDL: ANG HC-130Js require the integration of multiple radios, data links, rescue devices, and defensive systems to keep the primary focus on safe and successful mission accomplishment and not electronic management. Multiple efforts in technological advancement have resulted in a task saturated workload for HC-130 aircrews because those multiple efforts were accomplished independently. There is a $32 million shortfall with a 3-year timeline once funded.
- Onboard secure global network connectivity: ANG HC-130Js require secure, continuous, on-board connectivity over wide-band beyond-line-of-sight (BLOS) systems. As the CSAR coordinator role is advancing as an HC-130J capability, the requirement to communicate securely BLOS with multiple assets is critical. Currently, the HC-130J must rely on an outdated BLOS voice communication radio to receive and pass critical survivor information from command and control sources, delaying the recovery effort. The $18 million shortfall is not funded in the FYDP; 3-year timeline if funded.
- Precision geolocation and identification of isolated personnel: ANG HC-130Js require the ability to carry mission-specific capabilities including data link, sensors, communications, video downlinks, and electronic warfare payloads on external hard points without detrimental

effects to baseline aircraft capabilities, specifically aerial refueling. Wing mounted sensors for isolated personnel search and identification—$74 million shortfall not funded in the FYDP; 2-year timeline if funded.

- Increased survivability in contested environments: ANG HC-130Js require a robust self-defense capability to perform combat rescue in a hostile environment in a peer-to-peer conflict. To operate in a high threat environment, the HC-130J requires an RF jammer and digital RWR for improved radar detection capability, and must leverage improving technology to incorporate the newest chaff expendables to defend against a radar guided threat. Federated RWR and radio frequency jammer capability—$175 million shortfall is not funded in the FYDP; 3-year timeline if funded.

HH-60G: The ANG's 18 HH-60G helicopters provide 19 percent of the total Air Force fleet. ANG Personnel Recovery (PR) helicopters and aircrew play a critical role in support of overseas contingency operations while responding to an increasingly high demand for domestic operations. There are three ANG PR helicopter units and one ANG PR training unit associated with an active duty unit. The HH-60G modernization priorities included smart multi-functional color display improvements and acquisition of multiple datalinks. Additional upgrades have focused on modernizing aircraft communication systems and integrating a helmet mounted head-up display.

- Total Unfunded Modernization Shortfall: $234 million
- Modernized integrated defensive suite: Integration of infrared countermeasures and RWRs to the HH-60—$87 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Integrated flight deck with handheld device interoperability: ANG HH-60G aircrew require an integrated flight deck with wireless handheld device interoperability to fuse information from multiple sources into a common operating picture. This requires an open architecture on the HH-60G to enable digital interoperability and provide for access to aircraft derived information. To enable cross-platform communication, upgraded software definable radios will enable previously stove-piped communications channels to interoperate with various CSAR weapon systems. This cross wave form communications tool, to include cellular, ties civil response forces into traditional CSAR communications channels—$13 million shortfall funded by FY 2018 NGREA; estimated contract delivery 3Q FY 2020.
- Degraded visual environment-capable helmet mounted display: ANG HH-60Gs require day and night, helmet-mounted head-up display capability to significantly increase aircrew situational awareness and weapons employment, enhance terminal area search and rescue operations, speed overall internal communications during critical mission phases, and enable crews to safely land a helicopter in a degraded visual environment. A helmet mounted cueing system will allow all crewmembers to quickly build situational awareness without the need for voice communication. Sensor and data link symbols are visible on the helmet-mounted display superimposed over the geographic location of friendly, hostile, and survivor positions. Additionally, the ability to display sensor pictures, hazards, terrain, and data link information while maintaining a heads-up posture will greatly enhance safety while flying in

the low-level (<500ft) environment—$75 million shortfall not funded in the FYDP; 3-year timeline if funded.

- Weapons modernization to enable self-escort: ANG HH-60Gs require weapons modernization to provide reliable defensive firepower to support various combat mission operations. The fielded systems have no capability for target marking, concealment, or battlefield illumination. To reduce the cost of CSAR, the HH-60G needs a lightweight, precision and non-precision standoff weapons capability. The LAU-68 F/A Extended-Length Launcher is a lightweight 7-shot rocket pod allowing employment of precision guided munitions such as the Advanced Precision Kill Weapons System. This system is capable of delivering precision and non-precision guided rockets armed with anti-armor, high explosive, or anti-personnel warheads as well as non-lethal smoke or battlefield illumination payloads—$60 million shortfall not funded in the FYDP; 5-year timeline if funded.

EC-130J: The ANG's seven EC/MC-130J aircraft provide 100 percent of the total Air Force fleet. The EC-130J "Commando Solo" conducts information operations, psychological operations, and civil affairs broadcasts. ANG provides 100 percent of the three EC-130J assets in the USAF. The ANG continues to work with Air Force Special Operations Command (AFSOC) to identify capability gaps and field modernized capabilities.

- Total Unfunded Modernization Shortfall: $30.3 million
- Multi-mission payload external: The EC-130J requires a Multi-Mission Payload–Heavy (MMP-H) Communication Electronic Attack with Surveillance and Reconnaissance pod. This device will expand the current EC-130J capabilities. Four of seven EC-130Js do not currently meet the EW needs of the Combatant Commanders. MMP-H will bridge the gap between current Commando Solo capabilities and future EW needs—$6 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Federated defensive system unit: ANG EC-130Js require a federated Defensive Systems Unit (DSU) capable of aligning with updated operation flight programs, the ability to rapidly dispense chaff and flares, and an increased flare capacity. The DSU will allow the Combat Systems Officer to dispense chaff, flare, or both with a single button push without the need to switch settings on the defensive system's master panel. The federated DSU will decrease EC-130J aircrews' operational risk while increasing crew resource management and enhancing overall mission success. Chaff and flare dispense integration to aircraft primary software—$6 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Link-16: The ANG EC-130J requires a TDL to be interoperable with the active duty Air Force. AFSOC aircraft operate under the legacy Situational Awareness Data Link system while the conventional Air Force operates utilizing Link-16. This disconnect between systems causes a lack of a Common Operating Picture. Additionally, AFSOC required that all Special Operation Forces aircraft have Link-16 capabilities by August 2018. Equipping the EC-130 with Link-16 capability—$5 million shortfall; 2-year timeline once funded.
- Long Range Broadcast System (LRBS): Four of seven ANG EC-130Js do not currently meet primary mission requirements for psychological operations broadcast. While not matching

current Commando Solo capabilities, LRBS will enable an additional four aircraft to execute the primary mission task. The 193 Special Operations Wing (SOW) requires six LRBS pods, one for each of the four additional EC-130J aircraft, one for a maintenance spare, and one for a part task trainer—$12 million shortfall not funded in the FYDP; 2-year timeline if funded.

MC-12: United States Special Operations Command (USSOCOM) owns the 34 MC-12 aircraft that remain in the DoD inventory. As a USSOCOM platform, the MC-12 provides manned, airborne electro-optical (EO)/IR full-motion video (FMV) and signals intelligence coverage for U.S. special operations forces. There are two major MC-12 programmatic issues for which the ANG is awaiting resolution as this report is submitted:

- MC-12 aircraft availability in the 137 Special Operations Wing, Will Rogers Air National Guard Base (WRANGB), OK: The majority of USSOCOM's MC-12s are part of the government-owned, contractor-operated (GOCO) program known as JAVAMAN. Per the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy Change Recommendation for the 137 SOW, USSOCOM was to allocate 13 MC-12 aircraft for 137 SOW's home station training and overseas deployment requirements. However, during the first few years of the 137 SOW's conversion to the MC-12 mission, the unit struggled to achieve Initial Operating Capability milestones so USSOCOM shifted some of the MC-12 aircraft originally allocated to the 137 SOW to GOCO support. The result is the 137 SOW has averaged between three and five MC-12 aircraft on its ramp since 2017. In the meantime, the 137 SOW's recruiting and training effectiveness have increased which—when combined with current MC-12 tail availability—has resulted in a backlog of ingesting new students into, and training delays within, the MC-12 Formal Training Unit co-located at WRANGB. To remedy this situation, AFSOC is working with USSOCOM to increase WRANGB MC-12 tail availability to at least nine aircraft by the end of 1st quarter FY 2021. Nine aircraft is the minimum number required to sustain two MC-12 aircraft deployed 365-days/year and generate a sufficient number of training sorties at WRANGB to increase combat-mission ready MC-12 aircrew to meet the 137 SOW's Full Operational Capability requirements.
- A propeller upgrade to enable short field operations in austere environments was funded with FY 2017 NGREA and delivered in FY 2020. Modernization efforts funded with NGREA are only for the 12 aircraft operated by the ANG and all modernization upgrades to these aircraft will be easily installed and uninstalled to ensure compliance with the requirements of NGREA.
- Total Unfunded Modernization Shortfall: $37.1 million
- Second FMV sensor: ANG MC-12W units require an additional EO/IR sensor to meet the highly-demanding ISR tasks required by combatant and task force commanders. The ANG MC-12W mission heavily relies on the ability of the crews to see the smallest details on the ground from miles away. Currently, the MC-12W is outfitted with a single MX-15DiD sensor on each aircraft. While this allows the MC-12W to complete a wide range of ISR tasks, it is extremely limited in fidelity and flexibility. An added system will double the amount of area to be seen by MC-12W crews and provide a substantial amount of situational

awareness to the commanders on the battlefield—$22 million shortfall not funded in the FYDP; 2-year timeline once funded.

- Synthetic Aperture Radar: ANG MC-12Ws require a synthetic aperture radar for ground moving target indication, dismounted moving target indication, coherent change detection, and maritime search capabilities. A moving target indicator will greatly enhance the MC-12Ws ability to find and fix personnel and vehicles during reduced or obscured visibility conditions, such as clouds, fog, or smoke—$36 million shortfall not funded in the FYDP; 2-year timeline once funded.
- Airborne Mission Network: ANG MC-12W aircraft require an onboard TDL radio, with associated hardware and antennas, to employ across multiple areas of responsibility. MC-12Ws lack the means to establish and maintain direct TDL communications with command and control, tactical agencies, and other TDL users. TDLs share aircraft position, targeting data, sensor points of interest, cursor-on-target data, and target-track information derived from various intelligence sources via an airborne network. The lack of onboard TDL slows the kill chain, delays effects for supported commanders, and poses a safety risk with regard to aircraft position and airspace deconfliction—$7.5 million shortfall not funded in the FYDP; 2-year timeline if funded.

j. Command, Control, Intelligence, Surveillance, and Reconnaissance (C2ISR)

Air Operations Centers (AOCs): The ANG's seven AOCs provide 54 percent of the total Air Force number. The AOC weapon system is employed by the Joint Forces Air Component Commander (JFACC), facilitating operational control and direction of theater air, space, and cyber forces. Air National Guard AOC and Air Force Forces (AFFOR) staffs are comprised of personnel and facilities postured to support Homeland Defense, Overseas Contingency Operations, and Defense Support of Civil Authorities (DSCA). AOC personnel are organized as divisions specializing in integrated, distributed Command and Control processes and products. The AFFOR staff is organized as special and functional directorates that provide planning teams to the Commander, Air Force Forces in support of the JFACC.

- Total Unfunded Modernization Shortfall: $27 million
- Weapon System Modernization. ANG AOC units require the modernized Block 20 Falconer Weapon System to maintain readiness with the impending termination of the current 10.1 Weapon System. The Kessel Run/Pathfinder initiative is revolutionizing the way the Air Force develops, tests, employs, and updates AOC mission software, making it accessible via the Block 20 Weapon System through the cloud. To ensure redundant capability and connectivity, especially in a degraded mission environment, Pivotal Cloud Foundry (PCF) server racks hosting the Block 20 Weapon System will also be based at nine different geographic nodes (e.g., 603rd AOC in United States Air Forces in Europe). However, the current plan does not include fielding PCF server racks for ANG units. Instead, ANG units are expected to access the weapon system through the cloud without local hardware. This poses a potential mission degradation challenge for ANG AOC units accessing the cloud in a conflict where the cyber-enabled environment is contested or degraded. This upgrade will be

for six ANG AOCs, which support AC AOCs located OCONUS—$15 million shortfall not funded in the FYDP; 3-year timeline if funded.

- Single Pane of Glass (SPG) Display: ANG AOC operators and Air Force contingency planners need an SPG Display to conduct operations and training. The SPG solution provides simultaneous views of multiple classified and unclassified domains from a single client, enabling enhanced awareness of the battlespace. The SPG solution must be able to support the performance requirements of the graphics-intensive applications inherent to the Block 20 AOC Weapon System. An SPG solution is vital to modernizing AOC operations and bringing enhanced capability to the operator for more effective and efficient mission execution. This capability is required for six ANG AOCs—$6 million shortfall not funded in the FYDP; 2-year timeline if funded.
- Cross-Domain Solution (CDS): CDS provides simultaneous views of multiple classified and unclassified security domains on a single client, enhancing operating capability for more effective and efficient mission execution—$3.5 million shortfall not funded in the FYDP; 2-year timeline if funded.

Battle Control Centers (BCCs): The ANG's four BCCs, located in Alaska, Hawaii, Washington state, and New York, provide 100 percent of the total Air Force capability. The BCC operations force includes four ARC operations groups and squadrons. BCCs support North American Aerospace Defense and Northern Command as part of the homeland defense mission, DSCA, and search and rescue. BCCs provide 24/7 aerospace surveillance, warning, control, and maritime warning in the defense of North America.

- Total Unfunded Modernization Shortfall: $30 million
- Integrated Fire Control: The four BCCs require the advanced data link capabilities needed to pass critical tasking messages to perform integrated fire control. Along with advanced sensor integration, interagency and joint partnerships are critical to performing the Air Defense component of the homeland defense mission—$6 million shortfall not funded in the FYDP; 3-year timeline if funded.
- National Capital Region Camera Modernization: ANG BCCs requires a modernized Enhanced Regional Situational Awareness (ERSA) System at the Joint Air Defense Operation Center to provide continuous support of the BCC mission. This system includes all-weather, high-definition EO/IR sensors; a network architecture that transmits high-definition sensor imagery in its native format; and an improved ERSA user interface—$13 million shortfall not funded in the FYDP; 2-year timeline if funded.
- Live Virtual Constructive/Distributed Mission Operations (DMO) Training System: Each of the four BCCs requires a DMO-capable simulator training system that produces a virtual environment that can enable 4th and 5th generation fighter integration and allows control of the direction, de-confliction, and employment of ground, surface, and air assets. NGREA has been used to pay for three of the four required training systems—$5 million shortfall not funded in the FYDP; 3-year timeline if funded.

- CDS: A CDS would allow BCCs to integrate TDLs, provide functional redundancy to the Air Event Information Sharing Service, integrate joint service TDLs, and facilitate DSCA through the Situational Awareness Geospatial Enterprise application—$8 million shortfall not funded in the FYDP; 2-year timeline if funded.

Control and Reporting Centers (CRC): The ANG's 10 CRCs provide surveillance, tactical communications, data links, and combat-related air battle management of joint air operations with real-time networked situational awareness. The CRC, at the operational and tactical levels, provides surveillance, tactical communications, data links, and combat-related air battle management of joint air operations with real-time networked situational awareness to support Active Duty and ANG missions.

- Total Unfunded Modernization Shortfall: $32 million
- Integrated Mode 5/ADS-B: ANG CRCs require the capability to interrogate Mode 5 and access ADS-B data to complete an identification matrix organically—$11 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Remote Radar and Radio Access: ANG CRCs require a remote radar and voice communications integration package to execute specialized live-fly operations—$3 million shortfall.
- Electronic Attack Training System: The ANG CRCs do not have the capability to train against an electronic attack–equipped threat, leaving crews unprepared to mitigate real world radar degradation—$6 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Highly Mobile AESA Radar with Combat Identification: CRCs (AC and ANG) have experienced a significant shortfall in radar parts because of DMSMS of the current AN/TPS-75 Radar. The Air Force plan to maintain the AN/TPS-75 and replace it with the 3D Long-Range Radar (3DELRR) will fulfill mission requirements. The estimated fielding timeline for the 3DELRR to ANG units has been extended to FY 2030 which is significantly late to need—$12 million shortfall not funded in the FYDP; 3-year timeline if funded.

E-8C JSTARS: The ANG's 16 E-8C JSTARS aircraft provide 100 percent of the total Air Force fleet and are the world's premier wide-area surveillance moving target indicator, airborne, manned battle management command and control aircraft. All 16 E-8Cs have been or are in the process of being upgraded with a Global Imagery Server, Automatic Identification System, Integrated Broadcast System, and the Joint Worldwide Intelligence Communications System; all were fully funded with NGREA. Central computer modernization for all 16 E-8Cs was funded with ANG Operations and Maintenance funds.

- Total Unfunded Modernization Shortfall: $178 million
- Counter-Unmanned Aircraft Systems (UAS): Installs system capable of detecting UAS—$41 million shortfall; 3-year timeline once funded.
- Fifth-to-Fourth Generation Communications Gateway: Bridges interoperability gap between 5th and 4th generation fighter data links—$75 million shortfall not funded in the FYDP; 3-year timeline if funded.

- Command and Control Enterprise Common Battle Management Suite: Provides a common battle management suite with the E-3—$15 million shortfall not funded in the FYDP; 2-year timeline if funded.
- Increased Commercial/Military Beyond Line-of-Sight Internet Bandwidth Capability: Increases available on-board communications capacity—$40 million shortfall not funded in the FYDP; 3-year timeline if funded.
- Special Operations Forces–Integrated Situation Awareness Data Link: Provides a roll on–roll off data link gateway for USAF, ANG, and special operations forces—$7 million shortfall not funded in the FYDP; 1-year timeline if funded.

MQ-9: The ANG has 12 MQ-9 units capable of generating overseas MQ-9 capacity for geographic Combatant Commands. In addition, two of the ANG MQ-9 units each host one of the USAF's three MQ-9 formal training units, and three other units can launch MQ-9 airframes for CONUS-based continuation training and exercise participation. In FY 2020, the ANG provided 14 of the USAF's 60 blue-suit combat lines, and is scheduled to provide the same level of support in FY 2021. In FY 2020, the ANG MQ-9 Enterprise significantly increased the number of CONUS-based continuation training sorties to support Readiness levels in all units. FY 2020 also saw the ANG MQ-9 Enterprise participate in four CONUS exercises, which resulted in 36 sorties, 236 total flight hours, and 59 live and inert munitions expended.

- Total Unfunded Modernization Shortfall: $115.1 million
- IR, RF, and Laser Threat Awareness, Self-Protection, and Defeat: ANG MQ-9 aircraft require a defensive package suite that provides the ability to detect RF, IR, and laser threat systems and employ countermeasures to defeat these systems from initial detection through missile launch. MQ-9s lack the ability to detect any surface-to-air and air-to-air threats. Even if these systems were detected by another platform, the MQ-9 has no ability to defend against these threats. As a result, the MQ-9 is unable to conduct needed missions in areas where these threat systems are prevalent. The system for the MQ-9 must be able to provide jamming for RF, IR, and laser threats as well as countermeasures to defeat the system once a missile is launched—$82 million shortfall planned to be funded by NGREA; 3-year timeline once funded.
- Edge processing for Artificial Intelligence (AI) and Machine Learning (ML): ANG MQ-9 aircrews require the ability to quickly locate, identify, and distribute targets in a contested or denied environment. This limitation creates follow on effects for the entire kill chain when trying to rapidly find, fix, and engage targets in a high threat environment. Advances in machine learning and edge computing have created the ability to automate target identification by correlating multiple onboard sources of information such as the targeting pod and synthetic aperture radar and distributing those targets via the datalink architecture to Squadron Operations Centers (SOCs). This technology not only enhances the MQ-9s' capabilities on the battlefield, but it also accelerates the rest of the forces' ability to identify and engage targets in dynamic and difficult environments. The ANG MQ-9 community requires 20 AI/ML computers, one for each of the 17 SOCs and an additional 3 for podded

capabilities to demonstrate airborne processing and automated functions—$5.3 million shortfall planned to be funded with FY 2019 NGREA; 2-year timeline once funded.

- Open Mission Systems compliant hardware and software: ANG MQ-9 aircraft require Open Architecture Mission Control Modules (OAMCM) to enable third-party middleware-controlled onboard network connections for all sensors and aircraft payloads. The OAMCM enables rapid fielding of emerging sensor technologies, machine learning integration, and commercial off-the-shelf/government off-the-shelf payload integration. This OAMCM must allow high-bandwidth internet protocol–based communication between the ground control station, aircraft, and aircraft station to other aircraft stations—$19 million shortfall not funded in the FYDP; 3-year timeline if funded.

k. Space and Cyber

Space: The ANG has 8 squadrons and 1,008 personnel who provide missile warning, space situational awareness, satellite communications, and space electronic warfare capabilities to support operational, exercise, and planning activities along with other space support as requested.

- Total Unfunded Modernization Shortfall: $16 million
- Training Equipment: ANG Space Control Squadrons require adequate training equipment to meet Combatant Commander requirements. Without a signal environment that is offline from real world assets, space control operators do not obtain sufficient training and knowledge of mission operations. The three space control squadrons require eight environment presentation assemblies, eight combined advanced network emulators, three joint information operations range nodes and two spectrum analyzers. NGREA has funded $3 million of the required $19 million—$16 million shortfall not funded in the FYDP; 2-year effort if funded.

Cyber: The ANG has 21 Cyber Operations (CO) squadrons postured for cyber deterrence and cyber defense and focused on building cyber capabilities to defend warfighting capability and homeland/national interests against cyberattacks.

- Total Unfunded Modernization Shortfall: $10 million
- Airborne Cyber Interceptor Platform (ACIP): ANG CO units require a multi-platform, reduced form-factor cyberspace capability for CO in austere and off-network environments on airborne weapon systems. This cyber platform will interact with internet protocol devices to deliver cyber effects in near real-time and beyond line-of-sight. The system will provide an integrated capability for command and control of the platform including beyond line of sight, TDLs, or standalone systems. One ACIP system is required for each of the 20 Cyber units—$8 million shortfall not funded in the FYDP; 2-year effort if funded.

Cyber Infrastructure: The ANG supports over 106,000 personnel across the 54 States and Territories, providing unique ANG Air Control Alert coverage for CONUS training missions required to maintain combat aviation proficiency, as well as continuous support for ongoing persistent strategic missions including Air Refueling, Air Mobility, Space Control, and BCCs. Updating and supporting these missions and supporting continuous digital modernization needs

are the primary demands that require secure Department of Defense information network connectivity and enterprise services requirements at every ANG location. Robust, efficient cyber infrastructure and services are required to cultivate a ready digital workforce and take actions to evolve and adapt cybersecurity capabilities that also enable an agile, resilient defensive posture.

- Total Unfunded Modernization Shortfall: $122.1 million
- Long Haul Communication provides the digital pathways required to enable NIPR, SIPR, Joint Worldwide Intelligence Communications System, and various community of interest system connections that enable critical supported flying and cyber missions including real-time remote piloted aircraft missions in various combatant theaters and direct support functions including augmented reality used in maintenance areas, virtual reality applications, flight simulators, and distributed training operations. There is an emerging need for redundant and diverse communication transport connections to support AI and ML initiatives in addition to safety and critical mission connectivity needs, which will require significant initial costs and innovation experiments. Resilience and efficiency of redundant system connections will require implementation of software defined wide area networking (SD-WAN) technologies. There is a shortfall of $10 million ($6 million for 1Gbps Ethernet upgrades and $4 million for SD-WAN) which is not funded in the FYDP; 1-year timeline if funded.
- Digital transformation is sorely needed to address recapitalization of legacy technologies by eliminating existing time division multiplexing architectures and replacing them with current and emerging Ethernet based technologies that enable a defendable unified capabilities environment. This evolution will include leveraging cloud-based resources in many forms including enterprise user services (e.g., IL-5 O365 and milDrive), zero-trust enabled access controls, and AI/ML–enabled monitoring solutions that address service consumption from ANG installations and from off-net (i.e., from traditional guardsman homes) using both government and personally owned smart devices (computers and wireless/mobile cellular phones/tablets). There is a shortfall of $20 million ($18 million for O365, $1 million for milDrive, $1 million for missing SBC capability) which is not funded in the FYDP; 1-year timeline if funded.
- Current secure (SIPRNet) collaboration technologies are barely adequate at ANG installations. New cloud-based capabilities gaps must be employed to address both on-installation and remote access solutions that simultaneously address C2 challenges while providing timely and resilient capabilities and access where and when needed. Examples are enabling AFNET-S enterprise services across the ANG by employing the JADC2 devices (e.g., ADSV cloud host and client hardware/software), resilient responsive client patching systems, encryption devices/management, and secure mobile/cellular technologies providing voice and data functionality. There is a shortfall of $22 million ($10 million for SIPR govCloud IL-6 instance for hosting ADSV (and potentially Wickr on SIPR), $10 million for 5,000 ADSV devices, $2 million for TACLANE Agile VLAN capability) not funded in the FYDP; 1-year timeline if funded.

- Current ANG installation 1 Gbps core and access nodes must be recapitalized with 40Gbps IPv6 capable nodes using software defined networking to provide necessary system responsiveness and resiliency. There is a shortfall of $59.4 million ($50 million for Core/non-Core BAN Switch Recap, $9.4 million for NAC,) not funded in the FYDP; 1-year timeline if funded.
- Existing ANG Component Enterprise Data Center (CEDC) computer and store infrastructure is reaching end of support life and must be recapitalized and upgraded to trusted platform module capable hardware to continue supporting critical command enterprise applications being refactored for migration to a cloud hosted environment. There is a $10.7 million ($0.7 million for STRATUM-1 NTS, $10 million for CEDC computer & Store Recap) shortfall not funded in the FYDP; 1-year timeline if funded.

l. Agile Combat Support

Civil Engineering: The ANG possesses nine Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer units and 71 Prime Base Engineer Emergency Force units. NGREA funding provided upgrades to debris clearance and explosive ordnance disposal (EOD) teams' equipment. Upgrading ANG Civil Engineer units with new equipment aligns resources with the AC and provides horizontal and vertical construction capabilities, urban search and rescue, fire response, EOD, and chemical, biological, radiological, and nuclear (CBRN) tools for engineering forces.

- Total Unfunded Modernization Shortfall: $35.3 million
- EOD Base Response Equipment: 17 ANG units are uniquely trained and equipped to facilitate explosive operations during joint wartime missions. In the deployed environment, EOD operators routinely defeat improvised explosive devices, render unexploded ordnance safe, perform route clearance operations, conduct post-blast analysis and evidence collection, and embed with special operations forces. Furthermore, EOD technicians must also be prepared to respond to incidents involving chemical/biological weapons, weapons of mass destruction, and nuclear weapons. These units will be equipped with upgraded communications and robotic systems—$9 million shortfall not funded in the FYDP; 30-year effort if funded.
- Individual Wildland Firefighting Kits: ANG Firefighting and Emergency Services (FES) flights require fully equipped wildland firefighting kits to provide an initial response to wildland fires and provide Wildland Urban Interface protection. Firefighters must be trained and equipped to National Wildland Coordinating Group standards. The standardized wildland firefighting kits include fire shelters, hand tools, and personal protection equipment (PPE). The PPE sets include a Nomex shirt and pants. Each of the 63 ANG FES units, plus five additional units engaged in wildland firefighting, requires 10 wildland firefighting kits and associated PPE sets—$1 million shortfall not funded in the FYDP; 1-year effort if funded.
- PPE Cleaning Capability: The ANG requires upgraded PPE cleaning and testing kits for its FES units. An updated extractor (washer), dryer, and water penetrator tester will provide FES

units the ability to conduct proper post emergency cleaning of PPE. Routine contact with chemicals, fuel, and the products of combustion require decontamination, which can take weeks without in-house capability. With the addition of the water penetrator tester, all FES units will have the capability to conduct in-house annual advanced cleaning in accordance with National Fire Protection Association 1851 Standards. Each of the ANG's 63 FES units requires one cleaning and testing kit, as well as equipment training for three personnel—$2 million shortfall not funded in the FYDP; 2-year effort if funded.

Medical: The ANG possesses 89 Medical units, 27 of which have an additional tasking for the CBRN Enhanced Response Force Package (CERFP), 3 Guardian Angel units, and 10 Aero-Medical Evacuation units.

- Total Unfunded Modernization Shortfall: $14.3 million
- Critical Care Air Transport Team (CCATT) Equipment: 10 ANG units to be equipped with CCATT Equipment—$2.5 million shortfall not funded in the FYDP; 2-year effort if funded.
- En-Route Patient Staging System (ERPSS) Equipment: Two units to be equipped with ERPSS equipment—$4.4 million shortfall not funded in the FYDP; 2-year effort if funded.
- CERFP Modernization: Rapid Response Equipment is outdated and in need of update—$4.9 million shortfall not funded in the FYDP; 3-year effort if funded.
- Aero-Medical Evacuation (AE) Equipment: The AE equipment is currently loaned from AC stocks for the ANG AE mission—$2.5 million shortfall not funded in the FYDP; 2-year effort if funded.

Operational Training Infrastructure (OTI), Simulation and Range Instrumentation: OTI is the overarching training technology that encompasses and links all aspects of simulation, including DMO and range instrumentation, into a live, virtual, constructive battlespace environment. The ability to connect simulators for mission rehearsal events and exercises adds a significant and required level of realism to simulator training. Using NGREA, the ANG has aggressively invested in tactical and virtual range infrastructure to meet 5th generation aircraft training requirements. The baseline structure for OTI is a fielded array of high fidelity, state-of-the-art aircrew and weapon system simulators at every ANG unit. The ANG procures simulators through Air Force programs of record and designs, builds, and manages simulator programs in-house to meet training requirements.

- Total Unfunded Modernization Shortfall: $155 million
- F-16 Mission Tactics Trainer–Guard (MTT-G): provides distributed mission capable trainer for F-16 pilots. Eleven MTT-Gs, paid for with NGREA, have been delivered, but 22 more are required—$88 million shortfall unfunded in the FYDP; 5-year timeline once fully funded.
- MC-12W Mission Systems Trainer for the 137th Special Operations Wing Initial Qualification Course: provides full-crew immersive training for the mission crew—$7 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.

- HC-130J Weapon System Trainer for the 176th Wing: provides a Federal Aviation Administration Level D, full motion weapon system trainer for high level HC-130J rescue training—$28 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- Range Infrastructure: provides radios, datalinks, surrogate target, and EW emitters for ANG ranges to meet USAF Range Enterprise Tier standards—$32 million shortfall unfunded in the FYDP; 2-year timeline once fully funded.

Security Forces: ANG Security Forces include over 7,400 defenders from all wings in each of the 54 states and territories. Security Forces protect and support worldwide contingencies and home-station installations. The Security Forces missions include installation access control, base defense, asset security, suspect apprehension and detention, high-risk vehicle inspections, heavy weapons support with military operations in urban terrain, mounted and dismounted individual and team patrols, convoy operations, detainee movement operations, personal security details, fly-away security, Raven tasking, close precision engagement teams, active shooter response, and weapons qualifications through combat arms.

- Total Unfunded Modernization Shortfall: $56.3 million.
- Counter-Small Unmanned Aircraft System Defense Platform: ANG Security Forces require implementation of a counter small-unmanned aircraft system (sUAS) to defend vital installation assets. Presently, ANG lacks the capability to detect, identify, track, and defeat the most common sUAS threats. Its Security Forces do not possess the equipment, the associated training, or the ability to detect and mitigate threats from sUAS. The employment of a system that is able to minimally detect sUAS platforms, identify platforms, and subsequently mitigate a threat sUAS will enable Security Forces to execute its integrated base defense mission and protect resources vital to national security—$31 million shortfall not funded in the FYDP; 3-year effort if funded.
- Modular Small Arms Ranges: ANG Combat Arms (CA) personnel need a modular indoor containerized range (MICR) that will provide a fully enclosed zero surface danger zone and vertical danger zone environment allowing personnel to train and qualify safely 365 days a year, day and night, regardless of external environmental conditions. Additionally, personnel assigned to a deployable unit type code must now qualify once every 3 years to meet category B requirements, resulting in a minimum 33 percent increase in personnel requiring scheduled weapons qualification. With the MICR, CA personnel will be able to ensure all of the Air Force's assigned combat personnel, an average of over 250 personnel per installation, receive weapons qualification training in a timely and cost-efficient manner. The ANG has 28 installations with a small-arms range and only three are compliant with the Air Force Engineering Technical Letter 11-18: Small Arms Range Design and Construction. The need for a modular small arms range is magnified because, of the remaining 25 ranges, 8 are permanently closed and all 17 others are in a state of degraded operations—$45 million shortfall not funded in the FYDP; 4-year effort if funded.
- Integrated Base Defense Sensor Fusion and Analytics: The ANG Security Forces organizations require a system that collects, analyzes, and provides a real-time and situational awareness picture of emerging and near-peer threats. This system must link all currently

existing communication technologies, audio/visual equipment; situational awareness devices, weapon systems, and personnel. In addition, it must incorporate video and data analytics, intelligently fusing this raw data into a functional, lethal, and precision command and control platform. To achieve superiority over near-peer threats, this system must incorporate a 4-dimensional fluid battlespace and unknown threats—$142 million shortfall not funded in the FYDP; 4-year effort if funded.

Special Warfare: Special Warfare is a new nomenclature, replacing Battlefield Airmen. Special Warfare refers to the Combat Controller Teams, Guardian Angels, Special Reconnaissance (formerly Special Operations Weather Teams), and Tactical Air Control Parties mission design series.

- Total Unfunded Modernization Shortfall for the following items—$3.4 million
- Rigid-Hulled Inflatable Boat (RHIB): Airdrop certification of the RHIB and a metallic-hulled jet ski are planned for CY 2020, with fielding beginning in CY 2021. So far, $2.68 million of FY 2018 procurement funding has been provided as a congressional add to fund a portion of this requirement—there is an additional $1.2 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.
- Tactical Low Visibility Vehicles: FY 2017 NGREA was used to partially field these vehicles but remaining vehicles are currently unfunded—$2.1 million shortfall unfunded in the FYDP; 3-year timeline once fully funded.

B. Changes since the Last NGRER

While the FY 2020 Defense Appropriation improved the ANG's sustainment, modernization, and recapitalization efforts, there are still modernization gaps between the AC and RC equipment. The ANG's C-130 fleet continues to be primarily made up of legacy C-130H aircraft, though newer C-130Js have been added to the inventory via congressional adds. The C-130H Avionics Modernization Program was fully funded and on contract, which will significantly increase the aircraft's capabilities. The ANG's F-16 fleet remains primarily made up of legacy Block 30/32 aircraft that have received significant capability upgrades including center display units paid for with NGREA funding. The F-15C fleet is reaching the end of its useful life, but new F-15EXs will enter the inventory in the next few years. ANG continues to work within Air Force and DoD requirements development, acquisition, and test processes to ensure the ANG's fleet of aircraft is safe, modern, and fully integrated.

Significant ongoing changes since the publication of the previous NGRER:

- F-35 Lightning II deliveries to the 158th Fighter Wing, Burlington, VT, are in progress.
- KC-46 Pegasus deliveries to the 157th Air Refueling Wing, Pease, NH, are in progress.
- F-15 EX deliveries for test and evaluation are in progress.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2022 Equipment Requirements

Table 1 *Consolidated Major Item Inventory and Requirements* provides projected FY 2022–FY 2024 major equipment inventories and requirements.

2. Anticipated New Equipment Procurements

Table 3 *Service Procurement Program–Reserve (P-1R)* lists planned procurements for the ANG from the FY 2020 President's Budget request. Table 4 *NGREA Procurements* provides ANG planned NGREA procurements for FY 2017–FY 2019.

3. Anticipated Transfers from AC to ANG

Table 5 *Projected Equipment Transfer/Withdrawal Quantities* lists planned ANG transfers for FY 2022–FY 2024.

4. Anticipated Withdrawals from ANG Inventory

Table 5 also lists planned ANG major equipment withdrawals for FY 2022–FY 2024, including the force structure changes discussed in Section II, paragraph B of this chapter.

5. Equipment Shortages and Modernization Shortfalls

The Director, Air National Guard's three lines of effort remain the same: Readiness for Today's Fight; 21st Century Guard Airman; and Build for Tomorrow's Fight. The ANG's modernization efforts center on the first and last of these three tenets, continuously improving readiness and improving capability to support future combat and domestic operations. Some expected shortfalls for these lines of effort include F-15/F-16 AESA radars, C-130H propulsion upgrades, and mobile/deployable Remotely Piloted Aircraft Detect and Avoid Capability. Further information on equipment and modernization shortfalls that are anticipated through the end of FY 2022 are listed in the preceding "Modernization Programs and Shortfalls" section of this chapter and in the "ANG Equipment Shortfalls" section in Appendix B.

Table 1 *Consolidated Major Item Inventory and Requirements* and Table 8 *Significant Major Item Shortages* provide ANG equipment inventories, shortfalls, and modernization requirements.

D. Summary

The ANG's efforts are guided by the Chief, National Guard Bureau and the Director, Air National Guard's priorities and lines of effort. Readiness will remain a top priority. A modernized and recapitalized ANG with equipment and warfighting platforms fielded concurrently with the active duty is the most effective path to ensuring the NDS. The ANG's efforts are summed up best by the Chief, National Guard Bureau:[10]

> *There is only one standard of readiness in fighting America's wars. This readiness requires the National Guard to be deployable, sustainable, and interoperable with our active components. Enhancing full-time support and replacing and upgrading dilapidated facilities are vital in that regard. The National Guard also requires parity in equipping its force through concurrent and balanced modernization and recapitalization so that it can deliver the lethality required to the Joint Force.*
>
> *General Joseph L. Lengyel*
> *Chief, National Guard Bureau*

[10] Written statement of Gen Joseph L. Lengyel to Senate Appropriations Committee, Subcommittee on Defense, April 10, 2019, p. 3.

ANG
Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2021 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Air Refueling							
Air Refueling, KC-135R	KC-135R	$53,100,000	140	140	140	140	138
Air Refueling, KC-135T	KC-135T	$53,100,000	24	24	24	24	24
Air Refueling. KC-46A	KC-46A	No Data	12	12	12	12	12
Airlift							
Airlift, C-130H	C-130H	$21,000,000	99	86	84	76	68
Airlift, C-130J	C-130J	$61,664,000	35	40	42	42	42
Airlift, C-17A	C-17A	$235,400,000	50	50	50	50	50
Airlift, LC-130H [1]	LC-130H	$21,000,000	10	10	10	10	10
Electronic Warfare (EW)							
EW, E-8C	E-8C/AOT	$221,700,000	16	16	16	15	15
EW, EC-130J	EC-130J	$50,700,000	7	7	7	7	7
Fighter							
Fighter, A-10C	A-10C	$13,000,000	85	85	63	63	63
Fighter, F-15C	F-15C	$25,400,000	123	123	100	80	40
Fighter, F-15D	F-15D	$24,400,000	14	14	5	4	2
Fighter, F-16C	F-16C	$7,000,000	289	289	261	261	259
Fighter, F-16D	F-16D	$7,200,000	46	46	43	43	37
Fighter, F-22A	F-22A	$160,100,000	20	20	20	20	20
Fighter, F-35A	F-35A	No Data	20	20	34	58	60
Operational Support							
Op Support, C-32B	C-32B	$115,700,000	2	2	2	2	2
Op Support, C-40C	C-40C	$75,500,000	3	3	3	3	3
Rescue							
Rescue, HC-130J	HC-130J	$70,400,000	12	12	12	12	12
Rescue, HH-60G	HH-60G	$11,900,000	18	18	18	18	18
Miscellaneous Equipment							
MD-1A	MD-1A	$1,600,000	30	30	30	30	30
MD-1B	MD-1B	$1,600,000	5	5	5	5	5
MQ-9A	MQ-9A	$8,700,000	24	24	24	24	24
(1) Four LC-130s are National Science Foundation (NSF)-owned.							

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Average Age of Equipment

Table 2

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021.

Nomenclature	Equip No.	Average Age	Remarks
Air Refueling			
Air Refueling, KC-135R	KC-135R	58	
Air Refueling, KC-135T	KC-135T	60	
Airlift			
Airlift, C-130H	C-130H	31	
Airlift, C-130J	C-130J	15	
Airlift, C-17A	C-17A	20	
Airlft, C-40C	C-40C	16	
Airlift, LC-130H	LC-130H	34	
Electronic Warfare (EW)			
EW, E-8C	E-8C	49	
EW, TE-8A	TE-8A	49	
EW, EC-130J	EC-130J	19	
EW, RC-26B	RC-26B	25	
Fighter			
Fighter, A-10C	A/OA-10C	39	
Fighter, F-15C	F-15C	36	
Fighter, F-15D	F-15D	35	
Fighter, F-16C	F-16C	30	
Fighter, F-16D	F-16D	31	
Fighter, F-22A	F-22A	14	
Operational Support			
Op Support, C-32B	C-32B	16	
Op Support, C-40C	C-40C	16	
Rescue			
Rescue, HC130J	HC130J	1	
Rescue, HH-60G	HH-60G	29	
Intel Surveillance & Reconnaissance			
ISR, MQ-009A	MQ-009A	5	
Ground Control Station			
GCS MD-001A		11	
GCS MD-001B		11	

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Table 3

Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2020 would be expected to arrive in RC inventories in FY 2021 or FY 2022. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
FY 2019 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Helmet Mounted Cueing Systems	$750,000		
CAF Communications Suite Upgrades	10,137,000		
CAF Avionics Upgrades	41,191,000		
CAF Defensive Systems Upgrades	26,321,620		
CAF Advanced Targeting Pods	25,651,000		
CAF Combat Operations Enablers	1,410,000		
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications and Avionics Suite Upgrades	16,910,000		
MAF Defensive Systems Upgrades	41,525,000		
MAF Podded Sensors	23,076,000		
MAF Propulsion Upgrades	2,000,000		
MAF Airlift Operations Enablers	890,000		
Personnel Recovery, Special Operations, and Special Warfare			
HH-60G Communication, Avionics, and Defensive Systems	5,582,000		
EC/HC-130 Communications, Avionics, and Defensive Systems	1,964,369		
Guardian Angel / Special Tactics / Tactical Air Control Party Equipment	5,872,691		
Space, Cyber/Information Operations (IO), Command and Control (C2), and Intelligence, Surveillance, and Reconnaissance (ISR)			
Space Operations and Training Equipment	37,500,000		
Cyber Operations and Training Equipment	12,000,000		
Intelligence, Information, Imagery, Analysis, and Assessment.	4,631,200		
C2 Operations and Training Equipment	13,475,000		
ISR Communications, Avionics, Defensive Systems, and Operations Enablers Upgrades	39,450,000		
E8-C Joint Surveillance Targeting Attack Radar System (JSTARS) Communications and Systems	9,500,000		
Simulation, Distributed Mission Operations (DMO), and Ranges			
CAF Simulators	18,370,000		
MAF Simulators	4,190,000		
Personnel Recovery / Special Operations Simulators	1,000,000		
C2 Simulators (AOC, BCC, CRC, DCGS, JSTARS)	2,864,000		
ISR Simulators (RC-26, MC-12, RPA)	1,650,000		
Distributed Mission Operations / Live Virtual Constructive Equipment	4,039,000		
ANG Range and Information Upgrades	3,300,000		

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
Agile Combat Support			
Logistics Support Equipment	4,446,000		
Logistics Test Equipment	16,655,000		
Public Health and Medical Services Equipment	6,608,000		
Mass Care Support Equipment	4,500,000		
Civil Engineering and Explosive Ordnance Disposal	8,242,600		
Fire Fighting Equipment	1,707,000		
Emergency Management Equipment	6,780,000		
Security Forces Equipment	16,811,520		
Total	**$421,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

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Table 5

Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty	Remarks
Air Refueling					
Air Refueling, KC-135R	C-130H	-5			
Air Refueling, KC-46A	C-130J	+5			
Airlift					
Airlift, C-130H	E8C/AOT	-13	-2	-8	
Airlift, C-130J	C-130J	+5	+2		
Electronic Warfare (EW)					
Electronic Warfare, E-8C	E-8C			-3	
Fighter					
Fighter, A-10C	A-10C		-22		
Fighter, F-15C	F-15C		-23	-20	
Fighter, F-15D	F-15D		-9	-1	
Fighter, F-16C	F-16C		-28		
Fighter, F-16D	F-16D		-3	+24	
Fighter, F-35A	F-35A		14	+24	

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Table 7

Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is deployable in wartime. This data meets the Title 10 requirement to identify substitutes that are not the most desired equipment item.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No

Service Does Not Use Substitution to Satisfy Major Item Equipment Requirements.

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Significant Major Item Shortages

Table 8

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	F-16 AESA Radar Test and Initial Fielding (Phase 1)	333	261	$2,114,943	$552,000,000	ANG F-16 Block 25/30/32/40/42/50/52 aircraft require Active Electronically Scanned Array (AESA) radars to effectively execute doctrinally tasked mission sets including homeland defense. AESA radars provide a critical capability for Aerospace Control Alert (ACA) F-16s to detect and track multiple airborne targets of interest in dense civilian air traffic environments near major population centers. AESA radars will improve the capability of ANG F-16s in diverse mission sets, including close air support, surface attack, and defensive counter-air. Additionally, AESA radars eliminate several components associated with mechanical radars, thus improving reliability and reducing sustainment costs.
2	C-130H Propulsion Improvements	134	106	$9,000,000	$954,000,000	Provides efficiency and performance improvements for the C-130H model aircraft. Although the overall size of the H-model fleet may decrease over time, the ANG will continue operating this aircraft for the foreseeable future. As a result the C-130H can and should have an established modernization program for all aspects of the weapon system. Propulsion modernization is three different initiatives including the 3.5 engine upgrade, NP2000 eight-bladed propeller, and the Electronic Propeller Control System (EPCS). The 3.5 engine program updates the compressor and turbine stages of the T56 engine, and the resulting engines provide a 10% fuel savings and a 24% improvement in time on wing. The NP2000 eight-bladed propellers improve takeoff performance and low speed power, and significantly reduce maintenance requirements and deployed spares. The EPCS replaces mechanical control systems with digital controls that improve accuracy, eliminates all planned maintenance, and significantly improves the reliability of the components. When combined these systems will improve the overall efficiency, improve the performance, and extend the life of the T56 engines. Twenty-eight ANG C-130Hs are funded for NP2000 and 3.5 upgrades. All 134 ANG C-130Hs are funded for EPCS.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
3	C-130J Support Equipment	2	2	$29,000,000	$58,000,000	Funding provides support equipment and initial spares for C-130J ANG units receiving Congressional adds of C-130J aircraft. The Congressional adds did not include funding for support equipment or spare parts.
4	Mobile/Deployable Remotely Piloted Aircraft (RPA) Detect and Avoid Capability	12	9	$4,700,000	$42,300,000	The current Remotely Piloted Aircraft (RPA) configuration and equipment, along with international and FAA safety requirements, limit the ability to operate RPAs in international and domestic airspace. RPA flight operations require specific, International Civil Aviation Organization (ICAO), FAA, or foreign approvals, which restrict aircraft airspace routing and altitude. These restrictions inhibit aircrew training and degrade operational flexibility during Federal and state missions. An RPA operating with a Ground-Based Detect and Avoid (GBDAA) system meets the requirement of collision-avoidance contained in the ICAO Rules of the Air and FAA Federal Aviation Regulations (FAR). GBDAA systems incorporate low cost commercial off-the-shelf active radar sensors to provide ANG with an affordable, scalable, and transportable sense and avoid system.
5	Multi-Mission Design Series Real Time Information In the Cockpit (RTIC) for KC-135, C-17, C-130J Aircraft	224	224	$1,102,679	$247,000,000	Provides secure line-of-sight and beyond line-of-sight radios and data link to enable KC-135, C-17, and C-130J aircrews to participate in network- centric operations. Provides continuous positions of friendly and hostile forces to expedite mission execution. Enables rapid re- tasking of aircraft to maximize efficiency of refueling operations.
6	Digital Radar Warning Reciever (RWR) (C-130/F-16/C-17)	298	298	$1,000,000	$298,000,000	ANG aircraft perform demanding missions in close proximity to radio frequency (RF) based threats. Combat plans rely heavily on airlift for logistical support to front-line troops, requiring mobility aircraft to operate closer to adversary RF surface-to-air missile systems. At present, ANG C-130Hs have limited to no RF detection capability, and ANG C-17s currently do not have onboard radar warning receiver (RWR). The current F-16 Block 40/42/50/52 electronic warfare (EW) suite processor computers were designed in the 1980s and are not configured to provide advanced EW systems integration. Increased situational awareness is needed to correlate onboard and off-board threat detection, terrain masking, and optimized dynamic rerouting capabilities to avoid or minimize exposure to threats. A RWR with geolocation capability in dense RF environments is critical for all ANG C-130H, C-130J, and C-17 aircraft. A fully automated and integrated electronic attack suite processor enables ANG Block 40/42/50/52 F-16C aircraft to fully integrate existing and planned upgrades to the F-16 EW suite.

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Significant Major Item Shortages

Table 8

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
7	F-15 Conformal Fuel Tanks	105	105	$3,700,000	$388,500,000	Adding conformal fuel tanks (CFTs) and additional weapons stations to the F-15C/D provides the single greatest impact to combat operations planning for air dominance through 2040. These modifications are vital elements of the Air Component Commander's ability to deliver persistent, lethal air superiority. CFTs enable one formation of F-15s to provide nearly twice the normal duration of coverage in contested environments without the need for air refueling support or landing to reload weapons. CFTs also streamline weapons development and integration for all versions of F-15s through standardized weapons communication, thereby enabling the exploitation of rapid evolutions in weapons development throughout the F-15 fleet. Combatant commands can quickly exploit the advantages of a common F-15 fleet if all aircraft readily accommodate advanced weapons or off-the-shelf defensive countermeasure upgrades, such as a pylon-mounted fiber-optic towed decoy. With an aging air refueling fleet, anti-access/area denial (A2AD) challenges, and a decreasing number of air dominance platforms, F-15 CFTs help to mitigate the impact of these critical limitations.
8	Mobility Air Forces (MAF) Simulators	16	16	$8,425,000	$134,800,000	The ANG currently has 23 C-130 wings but only possesses one high fidelity simulator. In order to meet training requirements, a mix of both high and medium fidelity simulators are required, including 3 additional C-130J Reconfigurable Weapon System Trainers (RWST), 2 additional C-130H Weapon System Trainers (WST), 8 additional C-130H Multi-Mission Crew Trainers (MMCT), and 3 C-130J Multi-Mission Crew Trainers.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
9	Targeting Pod Upgrades	250	250	$920,000	$230,000,000	The ANG utilizes a large number of advanced targeting pods (ATP) across multiple aircraft types. ATPs give ANG aircraft precision targeting capability and the ability to get accurate coordinates of objects of interest, the ability to observe areas of interest, and an improved navigation capability, day or night. The ANG plans to utilize ATP capabilities on additional platforms. The ANG is also evaluating several ATP upgrades that will allow improved communications and sensing. ATP upgrades allow ANG platforms to take advantage of the new capabilities without incurring expensive Group A aircraft modification costs. ANG's goal is to obtain an open architecture in all of its ATPs. This will allow the utilization of available space for the latest technological advances and the ability to adapt ATPs to tomorrow's needs. Open architecture ATPs will also allow easy swapping of an ATP's components and software, thereby changing its capabilities based on mission requirements. ANG requires new ATPs for aircraft that do not have them, and modification of its current ATP inventory with new open architecture.
10	RPA Ground Control Station (GCS) Modernization	34	34	$353,000	$12,002,000	The MQ-1/9 cockpit, referred to as the Ground Control Station (GCS), was originally designed only as a test control station for new Remotely Piloted Aircraft (RPA) technology. Without further development of the cockpit system, urgent operational and combat needs pressed it into service as the actual operating console for the GCS.The inefficiencies of the GCS cockpit limit aircrew ability to fly the aircraft and manage the mission. The GCS's awkward human machine interface was the cause of aircraft accidents, mission effectiveness degradation, and mission failure.

ANG
Significant Major Item Shortages

Table 8

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
11	Isochronal Inspection Maintenance Stands	21	21	$1,108,333	$23,275,000	The ANG requires C-17, KC-135, C-40C, C-130J and E-8C isochronal (ISO) inspection stands. Aircraft maintenance is currently accomplished by using a mix of ladders and B-series stands. These maintenance workaround activities do not meet Air Force Occupational Safety and Health Administration (AFOSH) or Occupational Safety and Health Administration (OSHA) standards. Current KC-135 ISO inspection stands require frequent maintenance actions and numerous man- hours to maintain their serviceability, many are over 40 years old and no longer meet AFOSH or OSHA standards. Additionally, standardized KC-135 ISO stands do not exist in the USAF inventory. Stand sets for the C-17 (6), KC-135 (9), C-40C (1), C-130J (4) and E-8C (1) are critical to accomplishing periodic inspection requirements, since current maintenance practices are time consuming for the completion of inspection requirements.

III. Air Force Reserve (AFR) Overview

"In order to effectively support the Active Component and connect with the Joint Force, the Air Force Reserve must modernize simultaneously as the Air Force upgrades legacy platforms, adding capabilities required for the future fight."

Lieutenant General Richard W. Scobee, Chief of the Air Force Reserve

A. Current Status of the AFR

1. General Overview

The AFR must be structured, trained, and equipped for the future fight. The AFR is a Total Force mission partner involved in every Air Force mission set, with most AC initiatives affecting the AFR. To remain relevant contributors to joint operations, the AFR and Air Force must maintain interoperability as a Total Force. For the AFR to remain a lethal and fully interoperable Total Force partner, aging fleets must be recapitalized via concurrent fielding with the AC and ANG, and existing airframes must be modernized to keep them in the joint fight. The age of the AFR fleets has resulted in diminished manufacturing sources (DMS) for aircraft spare parts, which will continue to plague the AFR fleets throughout their remaining life spans. Lastly, the AFR needs support vehicles and equipment to meet readiness requirements and updated training simulators to ensure its Airmen are highly trained and proficient. The AFR can only provide strategic depth and operational support to the Joint Force in mission areas where its personnel are trained on the required weapon systems, and it is most effective when it can operate interchangeably with its AC counterparts.

Top AFR Equipment Focus Areas

- **Recapitalization** to maintain Reserve parity as the AC realigns to the NDS
- **Aircraft Modernization** to maintain readiness and compatibility to support the Combatant Commanders
- **Diminishing Manufacturing Sources** negatively impact the necessary repair capability to maintain readiness
- **Vehicles & Support Equipment** have been chronically underfunded to accommodate other modernization efforts
- **Training Simulators** must keep pace with aircraft modernization and force structure changes to best produce mission ready aircrew

Potential adversaries have studied the nation's vulnerabilities and employed technological advances to exploit them, thereby altering the nature of warfare and expanding conflict into new domains. The return of great power competition in an age of unprecedented global economic interdependence, combined with this proliferation of swiftly advancing technology, has created a unique and complex environment.[11]

The changing battlespace has given rise to new operational missions and generated a need for advanced capabilities. The AFR has aligned efforts with the AC to achieve irreversible momentum toward the 2018 NDS. This ensures the AFR is prepared for future conflict in

[11] Air Force Reserve Posture Statement, dated March 4, 2020.

support of the Total Force's mandate to provide ready forces for national defense. The FY 2021 AFR budget request postures the AFR to meet future operational requirements, prioritize modernization, enhance critical capabilities, and align operational assets with emerging and evolving missions. As warfighting domains become increasingly integrated, the AFR must be prepared to conduct joint all-domain operations to create decisive, asymmetrical advantages in the future fight. To enhance its ability to compete, deter, and win in any environment, the AFR remains focused on key mission sets and is actively expanding its capabilities in the space and cyber realms.[12]

Although new platforms such as the F-35, KC-46, B-21, and F-15EX will provide enhanced capabilities, both the AC and the AFR will continue to rely on many existing proven platforms. This necessitates aircraft modernization and system upgrades, which will provide the capabilities needed for the future fight and ensure survivability if operating in a contested environment.[13] Many aircraft need critical system upgrades to enhance AFR ability to provide relevant warfighting capacity to the Total Force and enable joint all-domain operations.[14] The AFR fleet is an average of 37 years old, approximately 6 years older than the AC fleet and 2 years older, on average, than the ANG. Weapon System Sustainment (WSS) is essential to the continued operation of legacy platforms, and the underfunding of WSS in previous years contributed to the numerous maintenance and parts supportability issues the AFR is experiencing. Support equipment and vehicles also age and degrade over time. Without recapitalizing these assets, the AFR is at risk, not just with respect to readiness, but also with respect to occupational health and safety.

The AFR has made significant gains in readiness over the last two years, enhancing mission capabilities, bolstering full-time manning levels, and increasing organizational efficiencies. However, there is still room to further modernize weapon systems, better posture forces to meet emerging and evolving mission requirements, and improve support to Airmen and their families. The AFR will continue its diligent efforts to meet the intent of the NDS, increase its interoperability within the Total Force, and further its integration within the Joint Force.[15]

The AFR consistently deploys alongside the AC for contingency operations. Concurrent and proportional fielding of equipment allows for safe, efficient, and lethal operations. In those areas where the AFR will continue to operate legacy fleets, diminishing manufacturing sources will continue to hamper mission capable rates. Where appropriate, modernization is key to survivability, interoperability, and lethality. The AFR can only provide strategic depth and operational support to the Joint Force in mission areas where its personnel are trained on the required weapon systems. The AFR is most effective when it can operate interchangeably with its AC counterparts.

[12] Air Force Reserve Posture Statement, dated March 4, 2020.
[13] Ibid.
[14] Ibid.
[15] Ibid.

a. Combat Air Forces (CAF)

The AFR provides 6 percent of the Air Force's CAF, contributing a significant number of aircrews in diverse mission areas that are maintained at the highest level of readiness to provide strategic depth, rapid surge capability, and daily operational support to the joint force. Current AFR unit equipped capabilities include B-52H, A-10C, F-16C, HH-60G, HC-130, and Guardian Angel (GA) units. The AFR maintains classic associations with the AC in the operation of A-10C, AC-130J, B-1B, B-52H, C-146, E-3, F-15E, F-16C, F-22, F-35, MC-130H, MQ-9, RQ-4, and U-28 weapon systems.

- 20 percent of A-10C close air support fleet
- 50 percent of A-10C Formal Training Unit (FTU) pipeline
- 6 percent of F-16 air to air-and-air-to-ground combat fleet
- 14 percent of Air Force personnel recovery capability, HH-60G
- 14 percent of Air Force fixed wing personnel recovery, HC-130J
- 24 percent of Air Force B-52 strategic strike fleet
- 100 percent of the Air Force's B-52H FTU pipeline
- 27 percent of GA capability.

A-10C: The A-10C Thunderbolt II is the Air Force's go-to ground attack fighter for close air support, forward air control-airborne, and combat search and rescue. The AFR operates 55 A-10 aircraft, providing 19 percent of the AF fleet, dispersed between Whiteman Air Force Base (AFB), MO, and Davis-Monthan AFB, AZ. The 924th Fighter Group at Davis-Monthan AFB, AZ, provides 50 percent of the A-10 FTU pipeline to create new A-10 pilots for combat operations. AFR A-10s are approaching an average age of 40 years and parts obsolescence and diminishing manufacturing sources have created sustainment challenges that cost valuable aircraft availability for training. The AFR has used NGREA to upgrade A-10 communications, aircraft avionics, and defensive systems to increase combat lethality and survivability. AFR has installed the latest in GPS Anti-Jam technology and employ updated targeting pods that allow for the employment of low collateral damage weapons. Aircraft and pilot survivability have been increased through radar and missile warning upgrades. To complement these improvements in advanced warning, the AFR hopes to modernize the self-protection jamming pod and field modern expendable radar decoys. It is already fielding digital radio controllers, new satcom radios, and Link-16 for tactical data transfer.

In 2019, the Air Force concluded its re-winging program to reconstitute the wings on 173 aircraft, which included equipping 36 AFR aircraft with the enhanced wing assembly. A new contract was awarded in August 2019 to reconstitute an additional 50 wing replacement sets, which will also include some AFR aircraft. The new wing program provides enough wings to support a fleet of 218 aircraft and will ensure a minimum of six combat squadrons remain in service until 2040.

B-52H: The B-52H Stratofortress has been the backbone of global attack and precision strike for the USAF. Current projections show the B-52H in service through 2050, putting the fleet at nearly 100 years of service. The B-52H Stratofortress serves as the workhorse of the conventional bomber fleet, possessing intercontinental range and the ability to employ accurate standoff weapons. The AFR operates 18 B-52 aircraft, 24 percent of the AF fleet, assigned to the 307th Bomb Wing, Barksdale AFB, LA. Currently, the 307th Bomb Wing is the only unit that produces new aircrew for this aircraft through their FTU, providing 100 percent of the formal training for B-52 aircrew. As expected on a platform first employed under the Eisenhower administration, parts obsolescence and diminishing manufacturing sources have created sustainment challenges that cost valuable aircraft availability for training. To keep the B-52H viable in any significant air campaign of the future and increase the aircrew's precision engagement capability, the LITENING advanced targeting pod color sensor needs to be upgraded from black and white targeting video to color to enhance the aircrew's ability to detect, acquire, and identify targets at long range. Additionally, there is a requirement for enhanced training capabilities through the digital mission recorder and color targeting pod emulator.

F-16C/D: The F-16 Fighting Falcon is a compact, highly-maneuverable, multi-role fighter aircraft that provides air-to-air and air-to-ground combat capabilities. It is a relatively low cost yet high-performance weapon system capable of performing day/night precision strike, close air support, and air-to-air beyond-visual-range interception missions. The AFR owns 54 F-16s, approximately 6 percent of the total fleet, residing at Naval Air Station Joint Reserve Base, Ft. Worth, TX, and Homestead Air Reserve Base (ARB), FL. The AFR's aircraft are Block 30, some of the oldest in the fleet at more than 30 years old. The AFR F-16C/D fleet is not projected for the service life extension program. The unit in Ft. Worth, TX, is programmed to remission to the F-35 beginning in FY 2024. The unit at Homestead ARB, FL is not yet approved to remission to F-35 but is anticipated to be included in future plans by FY 2030. AFR has used NGREA to improve the lethality and survivability and to maintain the combat relevance of existing F-16s. The AFR purchased the AESA radar upgrade that offers advanced lethal capabilities and improved reliability and maintainability. To keep aircraft on target, the AFR installed the latest in GPS Anti-Jam capability. It also installed the latest targeting pods to employ with great accuracy. This extreme accuracy allows Air Force Reserve Command (AFRC) F-16s to employ very low collateral damage weapons. To improve survivability, the AFR is upgrading radar warning and missile warning devices. To complement the advanced warning, it seeks to modernize the ALQ-131 self-protection jamming pod to enable advanced technology jamming techniques and seeks to field modern expendable radar decoys. To improve anti-jam and secure communications, the AFR is fielding digital radio controllers, new Mobile User Objective System–capable satcom radios, and MIDS-J Link-16 tactical data links. All of these technology leaps keep AFRC F-16s a lethal, survivable, and integrated part of the air war.

HH-60G: The HH-60G Pave Hawk's core mission is recovering personnel under hostile conditions, including search and rescue. This versatile helicopter conducts day or night operations into hostile environments to recover downed aircrew or other distressed personnel. Due to its versatility, the HH-60G may also perform peacetime operations such as civil search and rescue, emergency aeromedical evacuation, disaster relief, and humanitarian assistance. The

AFR operates and maintains 16 HH-60G aircraft, 15 percent of the total fleet, at Patrick AFB, FL, and Davis-Monthan AFB, AZ. These aircraft are approaching 30 years old. The current aircraft have limited command and control capability, which hampers their ability for personnel recovery, inter-fly with attack assets, and joint interoperability. The HH-60G is now in sunset and will not get more NGREA investment. The current programming plan recapitalizes this fleet with the HH-60W beginning in FY 2022, approximately three years after the AC replaces theirs.

HC-130J: The HC-130 is the only dedicated fixed-wing Personnel Recovery platform in the Air Force inventory. The HC-130 provides expeditionary, all weather personnel recovery capabilities, including the air refueling of recovery force helicopters and tactical delivery via airdrop or air-land of rescue personnel watercraft, all-terrain vehicles, and direct assistance in advance of recovery vehicles. The AFR operates and maintains HC-130J aircraft at Patrick AFB, FL. The AFR began recapitalizing the fleet in early FY 2020 and have fielded four HC-130J aircraft. The unit is programmed to operate a total of six aircraft. There is currently no plan to purchase HC-130J weapons systems flight simulators for Patrick AFB, FL. As a result, aviators must travel off station for proficiency training, impacting aircrew readiness.

Guardian Angel: GA is uniquely designed and dedicated to conduct personnel recovery across the full range of military operations and during all phases of joint, coalition, and combined operations. These elite warriors are the soul of a non-aircraft, equipment based, human weapons system. GA commonly functions with USAF HH-60 helicopters and HC-130 aircraft and consists of Combat Rescue Officers; Pararescuemen; and Survival, Evasion, Resistance, and Escape Specialists. It is enabled by specially trained combat support personnel. The AFR GA personnel and equipment are assigned to Patrick AFB, FL; Davis-Monthan AFB, AZ; and Portland International Airport (IAP), OR. Guardian Angel Personnel Recovery Mission equipment is needed to replace and upgrade existing communication equipment, recovery equipment, and self-defense systems to increase effectiveness and survivability of GA personnel forces that are committed to the recovery of isolated personnel.

b. Mobility Air Forces (MAF)

MAF include tactical and strategic airlift, air refueling, aeromedical evacuation, and mobility support capabilities. MAF forces comprise 54 percent of the AFR force structure, which contributes a significant number of trained and ready aircrews and support personnel. Currently, the AFR maintains unit equipped capability on the C-5, C-17, C-40, C-130H/J, KC-46, KC-135, and WC-130J. The AFR is a Total Force partner in classic associations at nine installations on the C-5, C-17, C-130J, KC-10, KC-46, and KC-135. For the Total Force, the AFR holds:

- 18 percent of aerial refueling capability
- 17 percent of tactical airlift capability
- 25 percent of Air Force aerial firefighting capability
- 100 percent of Air Force aerial spray mission
- 100 percent of the Air Force's weather reconnaissance mission
- 33 percent of Air Mobility Operations Squadrons

- 56 percent of the Contingency Response Flights
- 100 percent of the C-5 FTU pipeline
- 60 percent of Aeromedical Evacuation capability.

C-130H: The C-130H Hercules primarily performs the tactical portion of the cargo and personnel airlift mission. The aircraft is capable of operating from rough, dirt strips and is the prime transport for airdropping troops and equipment into hostile areas. The C-130H is an average age of 28 years old and resides completely in the AFR and ANG. The AFR owns and operates 42 C-130H aircraft at Dobbins ARB, GA; Youngstown ARB, OH; Maxwell AFB, AL; Peterson AFB, CO; and Minneapolis-St. Paul IAP, MN. Two AFR C-130H units are special mission platforms in addition to their cargo carrying and delivery roles. The 302nd Airlift Wing at Peterson AFB, CO, provides 25 percent of the fleet Modular Airborne Firefighting System capability and the 910th Airlift Wing at Youngstown IAP, OH, provides 100 percent of the Modular Aerial Spray System (MASS) capability. The MASS is tasked as the only large area fixed-wing aerial spray capability within DoD to control disease-carrying insects and pest insects and to disperse oil spills. AFR C-130H MASS capabilities were used extensively following Hurricanes Florence, Michael, and Dorian. The C-130H is currently on contract for the Avionics Modernization Program Increment 2 upgrades. This program effort will upgrade the C-130H with a digital avionics architecture allowing the AFR C-130Hs to fly unrestrictive flight in worldwide airspace and support improved required Navigation Performance capability, increased reliability, and reduced obsolescence. The AFR C-130H fleet is currently scheduled to receive propulsion upgrades, such as the 3.5 engine and NP2000 8-bladed propeller to overcome deficiencies in high density altitude environments and mitigate the growing maintenance and sustainment costs of legacy systems.

C-130J: The C-130J Hercules is the latest and most technologically advanced model of the C-130, with increased fuel efficiency, greater range, and increased reliability and maintainability while operating at just 45 percent of the cost of a C-130H. The aircraft is capable of operating from rough, dirt strips and is the prime transport for airdropping troops and equipment into hostile areas. The AFR owns 10 C-130Js residing with the 403rd Wing at Keesler AFB, MS. These aircraft have completed modernization of communications, navigation, and surveillance capabilities to meet international air traffic management and flight safety standards. To be relevant in the future fight, mission effectiveness and situational awareness can be improved via mission computer upgrades that allow real time data transfer, voice, and data links. The C-130J has infrared countermeasures installed, and adding a digital, advanced radar warning system will improve survivability in contested environments against radar guided missiles.

WC-130J: The WC-130J Hurricane Hunter is a C-130J transport configured with palletized weather instrumentation that collects weather data and provides vital tropical cyclone forecasting information as it penetrates tropical cyclones and hurricanes. An average weather reconnaissance mission might last 11 hours and cover almost 3,500 miles while the crew collects and reports weather data. The AFR is the sole DoD operator for the weather reconnaissance mission and operates 10 WC-130J aircraft from Keesler AFB, MS. The AFR provides direct support to National Hurricane and National Winter Storm operation plans. These aircraft have completed

modernization of communications, navigation, and surveillance capabilities to meet international air traffic management and flight safety standards. To improve effectiveness in storm reporting, the AFR would like to add real time image transfer capability to the aircraft. Currently, captured storm data cannot be transmitted until after landing. This data is more than three hours outdated when received. Real time data transfer will allow timely reporting during the critical time when storms are approaching the shore and ensure the best decisions can be made for protecting civilian lives and property.

C-5M: The C-5M Super Galaxy is a strategic transport aircraft and is the largest aircraft in the Air Force inventory. Its primary mission is to transport cargo and personnel for DoD. The AFR currently possesses 16 C-5M aircraft, split between Westover ARB, MA, and Joint Base San Antonio Lackland (JBSA Lackland), TX. The AFR possesses 31 percent of the C-5M fleet and provides 100 percent of the C-5M FTU pipeline aircrew training for the Total Force at JBSA Lackland. The modernization priorities within the AFR C-5 fleet include upgrades that enhance aircrew awareness, communication, and integration into the Combatant Commanders' network, like Link-16, RTIC, and piloted aircraft radio communication (ARC-210), which are essential to interoperability and mission success.

C-17A: The C-17A Globemaster III provides the Air Force with inter- and intra-theater airlift. It is capable of performing combat airdrop and is able to land on short, austere airfields. The AFR owns 26 C-17As, 12 percent of the Total Force, at March ARB, CA; Wright-Patterson AFB, OH; and Pittsburgh ARB, PA. Pittsburgh ARB re-missioned in 2019. To support the re-mission, infrastructure such as aircraft simulators and C-17A support equipment was purchased through a combination of regular appropriation and NGREA funds. The C-17 modernization priorities include those upgrades that enhance aircrew awareness, communication, and integration into the Combatant Commanders' network, like Link-16, RTIC, and piloted ARC-210, which are essential to interoperability and mission success.

C-40C: The C-40C provides worldwide air transportation for the Executive Branch, congressional members and delegations, DoD officials, high-ranking U.S. and foreign dignitaries, as well as other operations support requirements. The AFR owns and operates four C-40C aircraft, 36 percent of the total fleet, all residing at Scott AFB, IL. The C-40 aircraft is programmed to be divested in 2025 and is in the sunset period, preventing any additional upgrades.

KC-135R: The KC-135R Stratotanker provides worldwide air refueling, airlift, and aeromedical evacuation capabilities. The KC-135 is one of the oldest aircraft in the fleet, manufactured by Boeing nearly 60 years ago and is scheduled to remain in the AFR inventory until 2040. The AFR operates the KC-135 from Grissom ARB, IN; March ARB, CA; Andrews AFB, MD; Tinker AFB, OK; Niagara Falls Air Reserve Station, NY; and Beale AFB, CA. At the end of FY 2020, the AFR owned 62 KC-135R aircraft, 17 percent of the Total Force fleet. The tanker fleet is one of the most heavily tasked in support of current overseas contingency operations, and acts as a force extender to other aircraft getting to or coming home from the fight. For this reason, it has been an AFR priority to fund defensive systems for this airframe to provide integrated self-protection against infrared missile threats. The LAIRCM system is in the operational test phase

and has been programmed for AC aircraft in the program of record. The LAIRCM has not been programmed for the AFR. Additionally, upgrading the aircraft's mission computer will allow voice, data link, and real time data transfer capabilities to provide battlespace integration to aircrews, ensuring situational awareness and enhancing mission effectiveness in the future fight.

KC-46A: The KC-46A is the first phase in recapitalizing the USAF's aging tanker fleet. With greater refueling, cargo, and aeromedical evacuation capabilities than the KC-135, the KC-46A will provide next generation aerial refueling support to Air Force, Navy, Marine Corps, and partner-nation receiver aircraft. The Air Force is concurrently fielding the KC-46A to the AC, ANG, and AFR. The first AFR KC-46A was delivered to Seymour-Johnson AFB, NC, in June 2020. The unit has 4 aircraft assigned, which are programmed to grow to 12 aircraft in FY 2021.

c. Agile Combat Support (ACS)

ACS enables all other Air Force core functions by providing the essential capabilities and functions to deploy, establish, operate, and maintain the operations of an airbase and associated services (sustain) and to recover coalition air and space forces. The AFR provides deployable combat support and mission generation capability to the Air Force in various mission areas, to include:

- 13 percent of Air Force Emergency Management capability
- 16 percent of Air Force Traffic Management capability
- 17 percent of Air Force Prime Base Engineer Emergency Force civil engineer capability
- 18 percent of Air Force Rapid Engineer Deployable Heavy Operations Repair Squadron Engineers (RED HORSE) heavy construction capability
- 23 percent of Air Force Fire Protection capability
- 28 percent of Air Force Security Forces capability
- 28 percent of Air Force Logistics Plans capability
- 33 percent of Air Force Logistics Readiness Officer capability
- 44 percent of Air Force Explosive Ordnance Disposal capability
- 65 percent of Air Force Air Transportation capability.

Investments in other AF priorities have resulted in the acceptance of increased risk in the vehicle replacement and support equipment accounts, creating large shortfalls in both. In vehicles alone, the AFR has a $30.9 million, 333 vehicle shortfall, accounting for 79 vacancies and 254 vehicles continuing operations beyond their designed lifecycle. Previous years' NGREA funding purchased 66 vehicles across the command to mitigate the risk to mission success.

With respect to support equipment shortfalls, only 10 percent of total support equipment requirements have been funded since 2011. As the age of support equipment extends beyond its lifecycle, a cumulative backlog of replacement requirements now exists and must be funded. Without new support equipment, man hours are spent scraping together the resources necessary to do the job rather than quickly repairing assets and improving mission capability. Furthermore,

updates to Occupational Safety and Health Administration and Unified Facility Criteria standards have driven unanticipated requirements to ensure compliance and safety of Airmen. For example, the fall protection standard changed from 10 feet to 4 feet, driving not just additional equipment requirements but also facility modifications. Likewise, improvements in corrosion control standards caused concerns with the safety of paint booth operations necessitating additional equipment and policy changes to accommodate the well-being of AFR Airmen.

The diminished condition of support equipment also affects the war fighter's ability to support unit mobility commitments, base maintenance obligations, and training requirements. Civil engineering equipment for Rapid Airfield Damage Repair and RED HORSE units to support construction and maintenance of airfield runways, roads, taxiways, and building sites is insufficient. Without this equipment, RED HORSE cannot meet mission training demands to have fully qualified and proficient operators fulfill real world requirements. Units have previously rented or leased equipment but found that their limited budgets did not provide for enough time to meet all of their training obligations. Furthermore, several fleets, including the KC-135, F-16, and C-130H, have all reported shortages of support equipment that are now impacting their ability to fix and fly aircraft. Lacking enough regular appropriation to address these shortages, the AFR used NGREA to help close readiness gaps. For example, FY 2017 and FY 2018 NGREA expenditures outfitted the 914th Airlift Wing, Niagara Falls, NY, and 940th Air Refueling Wing, Beale AFB, CA, with airframe specific support equipment to ensure readiness in their new mission sets.

2. Current Status of Equipment

a. Equipment On-hand

Table 1 Consolidated Major Item Inventory and Requirements provides projected RC major equipment requirements and on-hand inventories to meet assigned missions. As of October 1, 2020, AFR possessed 288 of the 325 aircraft assigned to the inventory (87 percent). Aircraft in scheduled Programmed Depot Maintenance (PDM), an element of WSS efforts to reconstitute aircraft readiness, were assigned but not possessed. In FY 2020, the AFR began converting to KC-46 aircraft at Seymour Johnson AFB, NC; it divested the remaining five KC-135R aircraft to retirement or reassignment and gained four KC-46 aircraft. Additionally, the conversion at Pittsburgh ARB, PA, increased C-17A inventory from 18 to 26, and reduced C-130H inventory from 48 to 42 aircraft. Conversion from HC-130H to HC-130J is ongoing at Patrick AFB, FL. The unit has four assigned HC-130Js and anticipates six aircraft by the end of FY 2022. ANG HC-130J aircraft have been returned to their respective units.

b. Average Age of Major Items of Equipment

Table 2 Average Age of Equipment provides the average age of major equipment items as of October 1, 2020. The average age of AFR aircraft ranges from 1 year for the KC-46A to nearly 60 years for KC-135Rs and B-52Hs. As aircraft increase in age, there are corresponding increases in the requirements for Operations and Maintenance funding to maintain capability. For example, KC-135 aircraft now require additional Main Landing Gear strut inspections in

their depot packages to ensure there are no cracks or corrosion similar to those that caused the catastrophic collapse of the gear on an AC aircraft in 2018. This inspection is estimated to cost over $1 million per aircraft and is required on all 397 KC-135 aircraft in the Air Force fleet. Furthermore, spare parts for legacy aircraft are not readily available because the industrial base has limited ability to produce those parts only used in the military. As a result, the Air Force pays a premium price to restart parts production, often experiencing long lead times for parts delivery, as seen with the A-10 wing production. These factors often lead to reliance on the Aerospace Maintenance and Regeneration Group (AMARG), aka the Boneyard, at Davis-Monthan AFB, which pulls parts off retired aircraft to sustain the needs of the field. For example, the A-10 fleet have routinely pulled the centralized integrated control unit (CICU) from AMARG aircraft to help meet shortfalls in the field. However, this is a supply point of last resort and resources are finite and cumbersome to tap. The increased maintenance downtime accrued from exhausting the traditional supply chain and relying on AMARG as the supply system decreases aircraft availability, ultimately impacting training capability and mission readiness. AMARG cannot be solely relied upon to sustain the required capability needed to meet national defense demands.

c. Compatibility of Current Equipment with AC

AFR aircraft require modernization and technology upgrades to continue to maintain readiness and lethality in the future. Technology upgrades in communications equipment and advanced data link capability will enable communications between 4th and 5th generation platforms and enable the RC to seamlessly provide support to Air Force and joint missions. Achieving and maintaining an AFR that is technically compatible with the AC is also critical to ensuring the Selected Reserve has the ability to train to the same standards and be ready to operate seamlessly across the Total Force. The Air Force's recapitalization programs will close capability gaps of affected airframes. In the past, recapitalization programs often did not include the AFR's legacy systems or only included the ARC at the tail end of the program, leaving it subject to program changes and decrements. As a result, incompatibility challenges exist within the AFR's aging fleet of C-130H, KC-135R, A-10C, and F-16C aircraft. As an example, the AFR F-16 fleet requires Link-16 data capability to be effectively employed in the current operational environment with AC 5th generation aircraft. This difference in capability will only be exacerbated as the Air Force moves forward to Multi-Domain Operations (MDO) and JADC2 warfighting, rendering the AFR incompatible and potentially ineffective. There are also compatibility challenges with some types of support equipment. For instance, AFR Battlefield Airmen often find discrepancies between their unit-purchased individual field equipment and equipment specified by the AC training schoolhouse, degrading the effectiveness of the training received and potentially affecting integration with other forces during contingency operations.

d. Maintenance Issues

AFR is tracking maintenance issues that affect entire AFR aircraft fleets and ultimately drive down mission capable rates and impact training opportunities for Airmen. Two significant issues that affect AFR fleets are DMS and airframe corrosion. The average age of AFR aircraft is 37 years. These aircraft fleets have long been out of production. For example, the B-52 and KC-135 were produced during the Eisenhower administration, and the industrial manufacturing base to

produce and sustain aircraft parts is no longer readily available. Lapses in the availability of parts results in additional downtime and increased expense as the Air Force must new start contracts to initiate new production lines for low rate of production parts. In one example, the F-16C/D Block 30, as flown by the AFR, uses a different landing gear assembly than later, heavier Block 40/50 aircraft flown by the AC. When contracts expired, there were not enough landing gear components in the supply system to complete time scheduled maintenance on the Block 30 aircraft. The second issue the aging fleet faces is corrosion. The AFR is working with the Air Force Corrosion Center to identify solutions. The HH-60Gs stationed at Patrick AFB, FL, have experienced serious corrosion because of continued operations in salt water and their location on the Atlantic Ocean coast. The increased corrosion on these aircraft and other aging airframes in the AFR have impacted training and mission capable rates.

A-10C: Fleet readiness continues to be challenged by parts supportability. One example, the CICU, has been the highest driver of non-mission capable aircraft across the Air Force fleet and continues to cause significant aircraft down time. This aircraft component integrates onboard weapons stores with avionics capabilities in the cockpit. Without this function, the aircraft is unable to execute combat missions or effective training sorties. The part is currently under redesign. Additionally, supply shortages in multiple other components due to contract lapses, have led to non-mission capable rates on par with those caused by the CICUs. Furthermore, the high deployment rate and combat use of the A-10 has outpaced the longevity of the aircraft wings. The recent award of A-10 Thunderbolt Advanced-Wing Continuation Kit contract will provide wing replacement but will take approximately 3 years until start. The AF estimates as many as 126 aircraft may be grounded due to shortages of flyable hours on the existing wings. Of the AFR's fleet of 55 aircraft, 19 still require new wings. This is expected to affect both deployability and unit flying hour programs.

B-52H: The overall age of the aircraft and corrosion issues affecting the B-52 fleet require major structural repairs and are lengthening repair times, both in field-level inspections and in PDM days. With increasing frequency, structural components found deficient during these inspections have not been manufactured before or are produced at low rate and have extended lead times to manufacture. For example, one particular damaged skin panel of one aircraft has been through three cycles of PDM within the last 15 years, without being replaced because there is no source for the part. The TF-33 engine system continues to drive aircraft downtime due to reliability and spares availability and will not be remedied until the commercial engine replacement program is complete.

C-5M: The Reliability Enhancement and Re-engining Program is complete. Contracted Logistics Support contract issues are significantly impacting "M" model parts availability and the Warner Robins Air Logistics Center's ability to deliver PDM aircraft on time. The depot process continues to require longer flow times for aircraft because of low parts availability. AFR C-5 units are small compared to AC units, with eight Primary Assigned Aircraft (PAA) at JBSA Lackland, TX, and Westover ARB, MA. Diminished aircraft availability significantly impacts these units' ability to carry out their assigned missions.

C-17A: Since production of this aircraft has ceased, the fleet has seen a significant decrease is spares availability. This is a key indicator that without future input to stimulate the manufacturing base, this fleet will experience the same parts availability and sustainability challenges that plague other fleets. The AF has committed to increasing the spares posture of the ARC to improve aircraft availability across the fleet.

C-130H: This fleet is experiencing part supportability issues, and because of the fleet's size and age, the AMARG at Davis-Monthan AFB, AZ, aka the Boneyard is generally exhausted as a source of supply. Contract and organic repair sites are struggling to conduct repairs due to shortages of parts and sub-assemblies. For example, the main landing gear strut lacks pistons and outer cylinders to complete assemblies, and the wing flaps lack torsion bars for overhaul; both these systems are critical to general fleet operation. The System Program Office is working with parts program managers and manufacturers on solutions, but there is still unfilled demand in the field. As an example of successful modernization, the AFR C-130H fleet is now complete with ADS-B and Electronic Propeller Control System modifications. However, the current C-130H propulsion system still requires upgrades to complete all missions efficiently. Specifically, upgrading the engines with the 3.5 Engine Enhancement Package will increase engine life span, improve fuel economy, reduce takeoff distances, and increase the effective cargo capacity. Replacing dated four-bladed propellers with improved, modular eight-bladed propellers (NP2000) will provide improved thrust for heavy weight and short field operations, improving AFR C-130H support to customers who count on it to get in and out of austere locations. Previous fiscal year congressional adds funded these modifications for the ANG.

C-130J: The AFR C-130Js are some of the oldest in the Total Force fleet but are not currently experiencing significant spare parts availability or corrosion concerns. The production line at Lockheed Martin is still open and the aircraft are relatively new at 15 years old.

F-16C/D: The AFR has F-16C/D Block 30 aircraft that are some of the oldest in the operational fleet. These aircraft are experiencing significant maintenance downtime caused by aging aircraft wiring, diminished spare parts availability, and structural corrosion. As explained in the opening example, the demand for numerous parts, including main landing gear components or engine air valves, outpaced the 30-day supply, leading to additional aircraft down time for required inspections. The Air Force is working internally to right size spares availability and find alternate sources of supply and repair. The AFR has had to resort to AMARG for repair components in some instances. This is a finite supply point and not a reliable source. The aircraft have also experienced downtime because wiring is breaking down due to age and use. These aircraft are also experiencing structural corrosion that is driving additional PDM time for inspection and modification. All of these aging aircraft and diminished parts availability issues continue to drive not mission capable downtime and impact readiness training.

HH-60G: The fleet continues to experience severe corrosion issues based on geographic location and continuous utilization, as well as parts supportability limitations. The AFR has demonstrated that an older Corrosion Preventative Compound (CPC) is providing better protection than the current authorized CPC for AFR locations. The AFR will begin receiving the first of 10 former AC HH-60G's in FY 2022 and will begin retiring current AFR aircraft at that time. The AC

aircraft will have 2000 more flight hours on average than AFR's fleet of HH-60G's at the time of transfer.

HC-130J: The HC-130J is a new acquisition and does not currently have maintenance shortfalls.

KC-46A: The KC-46A is a new acquisition and does not currently have maintenance shortfalls.

KC-135R: After 60 years of flight, many parts for this aircraft are stock limited or non-procurable. The option to cannibalize from aircraft in storage at AMARG has dwindled, with many components completely or nearly exhausted. Additionally, expiring contracts and contracts that fail to perform to the agreed standard consistently drive mission capable rates down and could lead to grounding if not addressed (i.e., the Common Computing Module & Input/Output Concentrator is unsupported beyond 2022). Small AFR 8 PAA wings experience mission-impacting aircraft downtime because spare parts availability affects them more than it affects larger AC wings. There are currently no initiatives or efforts in place to modernize avionics, environmental systems, or engine controls that continue to contribute to aircraft downtime. Lastly, Unscheduled Depot Level Maintenance, follow on warranty work after PDM, and unreliable/obsolete support equipment are contributing to degraded aircraft availability for one of the most tasked assets.

WC-130J: The AFR WC-130Js are some of the oldest in the Total Force fleet but are not currently experiencing significant spare parts availability or corrosion concerns. The production line at Lockheed Martin is still open and the aircraft are relatively new at 15 years old.

e. Modernization Programs and Shortfalls

Table 8 Significant Major Item Shortages addresses program details of specific requirements identified through the AFR Prioritized Integrated Requirements List process; specifically, the AFR's unfunded or underfunded procurements or modernization programs affecting its ability to force project and generate readiness. The AFR list of modernization shortfalls prioritizes modernizing communications, improving aircraft defensive systems, upgrading radar and avionics across multiple platforms to maintain battlespace awareness, addressing shortfalls in support equipment and vehicles, and upgrading simulators and C-130 propulsion systems. Aircraft and support equipment must be modernized to maintain or reverse degraded capabilities, adapt to evolving threats, improve safety and efficiency, and overcome materiel age, DMSMS, or obsolescence.

f. Overall Equipment Readiness

The AFR accomplishes its mission with the oldest fleet of any component, a force that is too small for the missions it has been tasked with, and an aging infrastructure that continues to present challenges absent necessary upgrades and replacements. The risks accepted in WSS, delayed recapitalization, and refocused priorities on the high-end fight have caused fewer Air Force aircraft to be available despite having a larger enterprise fleet. While the AFR did make the former Secretary of Defense's mandate to achieve 80 percent mission capability rate for a month or two within the F-16 fleet, the Air Force fell short of sustaining this goal overall. If the AFR is to remain a combat-ready force, it must continue to evolve and adapt. Its capability to

deter, respond to, and eliminate threats relies on its ability to proactively and continuously develop advanced air, space, and cyber capabilities while simultaneously honing the readiness and lethality of the force.

g. Other Equipment Specific Issues: Diminishing Manufacturing Sources and Materiel Shortages (DMSMS)/Obsolescence

DMSMS/Obsolescence is an increasingly difficult problem for the Air Force which affects readiness of AFR weapon systems disproportionately because the manufacturing lives of many critical items get shorter while the lifecycles of military weapon systems continue to be increased. As discussed in paragraph 2.b, Average Age of Major Items of Equipment, increasing weapon system lifecycles and the accompanying DMSMS issues are also an AFR issue. Across the Air Force, the AMARG Boneyard is used as a routine supply source on multiple platforms, from A-10 centralized integrated control units to major structural components like vertical stabilizers for C-130 aircraft.

Materiel readiness is an immediate and urgent concern for the warfighter. Missions are affected when equipment cannot be supported. It is unacceptable for an aircraft to be non-mission-capable because of a DMSMS issue. To allow a DMSMS situation to progress to the point of affecting a mission (because items are not available) does not align with the NDS's line of effort to increase readiness and improve lethality, and is an indication of ineffective management of DMSMS. In addition, ineffective DMSMS management can uncontrollably escalate the costs of items. Furthermore, if wholesale levels from suppliers are low, customer wait times substantially increase not just at the local level, but across the Air Force enterprise. When reestablishing the stock level for a base, wait times can range from 9 to 12 months before parts are available.

Traditionally, efforts to mitigate the effects of DMSMS have been reactive, i.e., the effects are addressed only when they are seen. This reactive approach to DMSMS solutions leads to decisions that put a premium on faster solution paths with attractive short-term gains to avoid system inoperability, while ignoring the long-term paths that would lead to wide-scale solutions designed to avoid future DMSMS issues. To solve this issue with lower overall cost, DMSMS solutions must change from reactive to proactive. The building blocks of effective proactive management of DMSMS are established during the design and development of systems with investment into sustainment and eventual retirement plans.

B. Changes since the Last NGRER

No significant basing decisions have occurred within the AFR since the last NGRER. There are multiple pre-decisional force structure options presented in the FY 2021 budget, subject to Presidential and Congressional approval. Based on previous program decisions, two units are in conversion: Seymour Johnson AFB, NC, is converting from KC-135 to KC-46 and Pittsburgh ARB, PA, is converting from C-130H to C-17. Over the last year, the C-130H fleet completed the Electronic Propeller Control System upgrades, making it more capable in high-altitude and austere environments. The C-130 fleet also completed the ADS-B modifications, allowing them to operate in international airspace. Additionally, the Air Force awarded a contract for additional

A-10 wings, but the time for the contract to be implemented will likely be longer than the current wings have, forcing aircraft to ground.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2023 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements provides projected FY 2022–FY 2024 major equipment inventories and requirements. It reflects programming for the type and quantity of each major end item of equipment for the AFR.

2. Anticipated New Equipment Procurements

Table 3 Service Procurement Program – Reserve (P-1R) lists planned procurements for the AFR from the FY 2021 President's Budget request. *Table 4 NGREA Procurements* provides AFR planned NGREA procurements for FY 2019–FY 2021. Both these documents reflect the ongoing efforts to modernize the AFR fleet, including defensive systems upgrades and improved avionics and communications capabilities for CAF and MAF assets alike. *Table 1* shows a decrease in KC-135s in FY 2022, as the conversion to KC-46s at Seymour Johnson AFB, NC, completes. It also shows the addition of four HC-130Js in the same year, as the recapitalization of the AFR rescue fleet at Patrick AFB, FL, concludes.

3. Anticipated Transfers from AC to AFR

Table 5 Projected Equipment Transfer/Withdrawal Quantities lists planned AFR transfers for FY 2022–FY 2024. All projected additions are from previously programmed decisions.

4. Anticipated Withdrawals from AFR Inventory

Table 5 also lists planned AFR major equipment withdrawals for FY 2022–FY 2024, including the force structure changes discussed in Section II, paragraph B of this chapter.

5. Equipment Shortages and Modernization Shortfalls at the End of FY 2021

Table 1 Consolidated Major Item Inventory and Requirements and *Table 8 Significant Major Item Shortages* provide AFR equipment inventories, shortfalls, and modernization requirements. While the AFR does not have any aircraft shortages, there are numerous vehicle and support equipment shortages. Of the aircraft assigned to the AFR, there are modernization shortfalls that could hinder the AFR's capability to defend against the threats in today's evolving environment. Many initiatives are already in place, including multi-domain secure data links, which span multiple platforms, addressing the AFR ability to interface and integrate with other components both in the air and on the ground. Many initiatives are already developed and just require the resourcing to complete the modifications. Several of these initiatives and modifications are ongoing, but not fully funded. For example, the AFR needs to modify its simulator fleet to keep pace with aircraft modernizations and ensure equivalent training for its pilot force proficiency.

D. Summary

The AFR force structure, built to deter the Cold War foe, was able to meet the competition of non-peer conflict for nearly three decades. However, near-peer threats have now expanded the battlespace to new levels, to include space and cyber. These enemies have closed gaps in their

capability and capacity, and they've made clear their intent to seize advantages, at speed. With the Air Force's focus on multi-domain operations to maintain its competitive edge, the AFR's strategic depth and operational readiness will enable it to continue to play a pivotal role in the total force.

For the AFR to remain a lethal and fully interoperable Total Force partner, recapitalizing aging fleets via concurrent fielding with the AC and ANG is necessary, as is modernizing existing airframes to keep them in the joint fight. The age of the AFR fleets have resulted in DMSMS for aircraft spare parts that will continue to plague them throughout their remaining life spans. Lastly, the AFR needs support vehicles and equipment to meet readiness requirements and updated training simulators to ensure its Airmen are highly trained and proficient. The AFR can only provide strategic depth and operational support to the Joint Force in mission areas where personnel are trained on the required weapon systems. It is most effective when operating interchangeably with its AC counterparts. Let there be no doubt, AFR Airmen stand ready to defend the homeland, deter nuclear conflict and enhance nuclear readiness, own the high ground in any conflict with air and space superiority, and project global vigilance, reach, and power with joint teammates, allies, and partners.

AFR

Table 1

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2021 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Air Refueling							
Air Refueling, KC-135R	KC-135R	$58,004,247	62	62	62	62	62
Air Refueling, KC-46A	KC-46A	$157,905,269	12	12	12	12	12
Air Support							
Weather, WC-130J	WC-130J	$52,960,487	10	10	10	10	10
Airlift							
Airlift, C-130H	C-130H	$29,208,025	42	34	34	34	34
Airlift, C-130J	C-130J	$64,187,819	10	10	10	10	10
Airlift, C-17A	C-17A	$243,283,524	26	26	26	26	26
Airlift, C-5M	C-5M	$258,314,216	16	16	16	16	16
Airlift, C-40C	C-40C	$89,016,563	4	4	4	4	0
Bomber							
Bomber, B-52H	B-52H	$41,996,566	18	18	18	18	18
Fighter							
Fighter, A-10C	A-10C	$10,104,995	61	61	61	61	61
Fighter, F-16C	F-16C	$10,690,664	52	56	30	30	30
Fighter, F-16D	F-16D	$13,198,316	2	2	2	2	2
Fighter, F-35A	F-35A	$107,750,669	0	0	12	26	26
Rescue							
Rescue, HH-60G	HH-60G	$14,290,852	16	10	0	0	0
Rescue, HH-60W	HH-60W	Currently no HH60W out of production	2	6	13	14	14
Rescue, HC-130J	HC-130J	$73,744,911	4	6	6	6	6

AFR
Average Age of Equipment

Table 2

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021.

Nomenclature	Equip No.	Average Age	Remarks
Air Refueling			
Air Refueling, KC-135R	KC-135R	59	
Air Refueling, KC-46A	KC-46A	1	
Air Support			
Weather, WC-130J	WC-130J	19	
Airlift			
Airlift, C-130H	C-130H	27	
Airlift, C-130J	C-130J	16	
Airlift, C-17A	C-17A	19	
Airlift, C-5M	C-5M	32	
Airlift, C-40C	C-40C	12	
Bomber			
Bomber, B-52H	B-52H	58	
Fighter			
Fighter, A-10C	A-10C	39	
Fighter, F-16C	F-16C	32	
Fighter, F-16D	F-16D	32	
Fighter, F-35A	F-35A	0	First aircraft projected to arrive FY24
Rescue			
Rescue, HC-130J	HC-130J	1	
Rescue, HH-60G	HH-60G	29	
Rescue, HH-60W	HH-60W	0	First aircraft projected to arrive FY22

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Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024
P-1R data from FY 2022 President's Budget Submission was not available in time for publication in the FY 2022 NGRER.			
The FY 2022 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (https://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2022 President's Budget Submission.			

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2022 would be expected to arrive in RC inventories in FY 2023 or FY 2024. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020[1]	FY 2021[2]
FY 2019 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Helmet Mounted Cueing Systems	$2,250,000		
CAF Communications Upgrades	11,500,000		
CAF Avionics and GPS Upgrades	8,525,000		
CAF Defensive Systems Upgrades	7,000,000		
CAF Radar and Targeting Enhancements	43,760,000		
CAF Combat Operations Enablers	980,000		
Simulators and Training Devices	5,350,000		
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications and Datalink Upgrades	28,600,000		
MAF Defensive Systems Upgrades	16,400,000		
MAF Combat Operations Enablers	4,535,000		
Special Operations / Personnel Rescue / Guardian Angel			
Rescue Communication and Datalink Upgrades	26,500,000		
Guardian Angel Mission Equipment	9,800,000		
Special Mission			
Special Mission	11,500,000		
Agile Combat Support			
Agile Combat Support - Support Equipment	11,800,000		
Agile Combat Support - Vehicles	7,000,000		
Agile Combat Support - Expeditionary Tactical Equipment	4,500,000		
Total	**$200,000,000**	**$0**	

1. NGREA Funds for FY 2020 were reallocated by DoD.
2. NGREA FY 2021 Equipment buy lists were not available in time for publication in the FY 2022 NGRER.

AFR
Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty	Remarks
Airlift					
Airlift, C-130H	C-130H	-8			(-8) Airlift conversion plan
Fighter					
Fighter, A-10C	A-10C	+6			(+6) Fighter conversion plan
Fighter, F-16C	F-16C		+4	-28	Carswell Conversion (FSW shows Carswell with 2 F-16 past FY24)
Fighter, F-35A				+12	
Rescue					
Rescue, HH-60G	HH-60G		-6	-4	(-10) rescue mission conversion to (W)
Rescue, HH-60W	HH-60W	+2	+4	+7	(+13) Rescue

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Table 7

Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is deployable in wartime. This data meets the Title 10 requirement to identify substitutes that are not the most desired equipment item.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No

Service Does Not Use Substitution to Satisfy Major Item Equipment Requirements.

AFR
Significant Major Item Shortages

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Aircraft Defensive Systems (KC-135, F-16, A-10, C-130, C-5)	various	various	various	$336,700,000	Proliferation of evolving anti-aircraft missile threats has outpaced many of the legacy AFR aircraft defensive missile systems. This places aircrew and mission success at increased risk. Current aircraft defensive systems to address the threat are: Large Aircraft Infrared Countermeasures (LAIRCM), ALR-69A Digital Radar Warning Receiver and fighter aircraft active IR Missile Warning Systems (MWS). Block-30 LAIRCM for: C-130H - 34 @ $2M = $68M; KC-135 - 60 @ $0.9M = $54M; ALR-69A for: F-16 - 27 @ $0.9M = $24.3M; A-10s - 55 @ $0.9M = $49.5M; KC-135 - 62 @ $0.9M = $55.8M; C-5 - 16 @ $0.9M = $14.4M; and C-130Js - 10 @ $0.8M = $8M. An active IR MWS for the F-16, 27 F-16s @ $1.1M each = $29.7M; and replace the current A-10 MWS with newer IR detectors, A-10s 55 @ $0.6M = $33M.
2	Link 16 (F-16, A-10, C-130H, C-130J, HC-130J, C-5, KC-135)	210	210	$590,000	$127,320,000	Combatant Commanders expect all aircraft to have datalink integration with existing networks. Link-16 is the primary DOD Tactical Data Network (TDN) for tactical battlespace awareness by aircraft and command and control (C2) entities. Link-16 brings critical information to the pilot/aircrew such as friendly or hostile ground party locations along with other network aircraft location and associated data (heading, altitude, identification). Likewise, battlespace managers and ground parties may not have access to specific aircraft information without data link integration. (Link 16 terminals installed @ $0.59M each. 27 F-16s = $15.93M; 55 A-10s = $32.45M; 42 C-130Hs = $24.78M; 10 C-130Js = $5.9M; 6 HC-130J = $3.5M; 62; 14 C-5s = $8.26M KC-135s = $36.5M)

AFR
Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
3	Targeting Pod Upgrades	90	90	$ 1,500,000.00	$ 135,000,000.00	AFRC utilizes advanced targeting pods (ATP) across multiple MDS. ATPs give aircraft precision targeting capability, the ability to acquire accurate coordinates of objects of interest, the ability to observe areas of interest, and an improved navigation capability in clear/obscured conditions day or night. AFRC is also evaluating several ATP upgrades that will allow improved communications and sensing. ATP upgrades allow AFRC platforms to take advantage of the new capabilities without incurring expensive Group A aircraft modification costs. AFRC's goal is to obtain an open architecture in all of its ATPs. This will allow the utilization of available space for the latest technological advances and the ability to adapt ATPs to tomorrow's needs. Open architecture ATPs will also allow easy swapping of an ATP's components and software, thereby changing its capabilities based on mission requirements and aircraft availability. AFRC requires new ATPs for aircraft that do not have them, upgrades to current sensors, and modification of its current ATP inventory with new open architecture.
4	Radars (F-16)	27	27	$3,100,000	$83,700,000	Current F-16 Block 30 radars have obsolescence/supportability problems that increase their maintenance cost and decrease their availability. A modern Actively Electronically Scanned Array (AESA) radar dramatically decreases maintenance cost and significantly increases availability, accuracy, lethality and allows better support of 5th Gen aircraft tactics.
5	Real Time Information in the Cockpit (RTIC) (C-5, KC-135, C-17)	various	various	various	$99,000,000	Communication upgrades that will provide aircrews the ability to report and receive battlespace and mission information. 14 C-5's, 61 KC-135's, and 24 C-17's @ $1M each = $99M
6	Jam Resistant Global Positioning System (GPS) (KC-135, A-10 F-16, C-5)	various	various	various	$30,300,000	Aircraft Embedded GPS/INS (EGI) faces warfare navigation challenges. The EGI has significant parts obsolescence issues and new sophisticated jamming techniques can have serious implications for mission success. Updating KC-135, F-16 and A-10 EGI will provide robust SAASM capability now and lay a path to M-Code GPS when it becomes available. KC-135 - 62 @ $0.2M = $12.4M; F-16 - 54 @ $46K = $2.5M; A-10 - 55 @ $280K = $15.4M; C-5 - 16 @ $200K =$3.2M

AFR
Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
7	Avionics Upgrades (A-10)	55	55	$475,000	$26,125,000	A-10 low-definition black and white avionics displays are unable to match the signal quality of the information sent to them. Targets are being missed and pilots are flying closer to the threats in an attempt to gain positive identification. High Resolution Display (HRDS) significantly improve mission success and safety while reducing pilot workload.
8	Propulsion Upgrades (C-130 Engine/ Propellers)	34	34	$6,047,620	$205,619,080	The current C-130H propulsion system performs deficiently in high density altitude environments and drives excessive maintenance costs. It requires a comprehensive upgrade to: improve performance and reliability; increase fuel efficiency; reduce airframe fatigue due to excessive vibration; decrease maintenance costs; and increase safety margins during critical phases of flight. Upgrading the T-56 engine with the 3.5 Engine Enhancement Package (EEP) will increase engine life span, improve fuel economy, reduce takeoff distances, and increase the effective cargo capacity. Replacing dated four-bladed propellers with improved, modular eight-bladed propellers (NP2000) will provide improved thrust for heavy weight and short field operations, while increasing fuel efficiency.
9	ARC -210 (KC-135, C-5, C-130H, C-130 J, HC-130J)	various	various	various	$12,800,000	Modern cryptographic requirements and fundamental changes to satellite communications drive radio modernization. Beyond Line of Sight upgrade at $0.1M each. 6 HC-130Js = $0.6M; 34 C-130Hs = $3.4M; 10 C-130Js = $1M; 62 KC-135's = $6.2M; and 16 C-5 = $1.6M.

AFR
Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
10	Simulators (C-5, HC-130, A-10)	various	various	various	$78,300,000	Current state of simulators (sims) losing effectiveness due to disparity with actual aircraft configurations. AFRC supports 23 simulators across the Total Force. Periodically, training requirements dictate either new or upgraded sims. Over time, the differences will continue to grow and render the sims less useful for mission readiness training. The challenges associated with tying Military Construction (MILCON) and Lead Command (LC) coordination to sim requirements delays purchases and delivery of capability. This impacts our ability to meet combatant commanders' requirements to accomplish their mission. C-5 Fuselage Trainer@ $21.5M; HC-130J @ $33M; Guardian Angel Freefall Trainer @$7M; WC-130J Part Task Trainer @ $7M; Defensive Space Control simulator @ $7.4M; Global Strike simulators @ $2.1M; A-10C Full Mission Trainer (FMT) High Resolution Display System (HRDS) @ $0.3M;
11	Support Equipment	various	various	various	$25,000,000	Agile Combat Support (ACS) Critical Support Equipment (SE) shortfalls for unit training, sustainment of existing missions, and mission conversions. SE shortfalls range across all functional areas, and as the average age of SE increases, there is a direct correlation to a demand for more Operation and Maintenance funding to preserve the capability.

Chapter 6
United States Coast Guard Reserve[1]

I. Coast Guard Overview

For more than two centuries, the U.S. Coast Guard (USCG) has performed increasingly complex missions in the most challenging marine environments. In that time, its responsibilities have continuously expanded to encompass every aspect of maritime governance. By statute, the USCG is an Armed Force, capable of operating in the joint arena at any time and functioning as a specialized service under the Navy in time of war or when directed by the President. The USCG leverages broad authorities, partnerships, and operational presence as a system to meet mission responsibilities. Employing a unique blend of military, law enforcement, humanitarian, and regulatory capabilities, the USCG prevents incidents when possible and responds when necessary. Table 6-1 provides an overview of the programs listed in the 2013 Department of Homeland Security (DHS) Federal Program Inventory for the USCG and the corresponding 2002 Homeland Security Act missions that support them.

Table 6-1. Coast Guard Programs and Missions

DHS Program Inventory	USCG Missions (Homeland Security Act of 2002)
1. Defense Operations	Defense Readiness
2. Maritime Law Enforcement	Drug Interdiction
	Migrant Interdiction
	Living Marine Resources
	Other Law Enforcement
3. Maritime Prevention	Ports, Waterways and Coastal Security—Prevention Activities
	Marine Safety
	Marine Environmental Protection—Prevention Activities
4. Maritime Response	Search and Rescue
	Marine Environmental Protection—Response Activities
5. Maritime Security Operations	Ports, Waterways and Coastal Security—Operational Activities
6. Marine Transportation System Management	Aids to Navigation
	Ice Operations
7. Mission Support	All Missions

USCG assets and personnel have deployed and operated under the control of DoD commands conducting major combat operations, providing humanitarian assistance, combating terrorism, and completing other missions. USCG forces give combatant commanders capabilities to interact with many regional maritime partners and provide a maritime law enforcement capability in their areas of responsibility.

[1] The USCG Reserve is part of the Department of Homeland Security. This chapter is included at the request of DHS and questions about this chapter should be addressed to DHS.

USCG forces are included in Department of Defense (DoD) contingency plans to mitigate redundancy and sub-optimal use of DoD capabilities resident in the national defense inventory. Use of USCG forces is driven by force readiness, national security requirements, and risk-based decision-making principles. DHS and DoD cooperate under three key memoranda of agreements that facilitate the following defense operation imperatives:

- USCG inclusion in Maritime Homeland Defense Operations
- DoD Support to USCG Maritime Security Operations
- USCG Support of the National Military Strategy, specifically in the areas of
    - Maritime Interception and Interdiction Operations
    - Military Environmental Response
    - Port Operations, Security, and Defense
    - Theater Security Cooperation
    - Coastal Sea Control Operations
    - Rotary-Wing Air Intercept Operations
    - Combating Terrorism Operations
    - Maritime Operational Threat Response Support
    - Cybersecurity Operations.

As the USCG's only dedicated surge force, the Coast Guard Reserve Component (RC) is a contingency-based workforce, trained locally and deployed globally to provide appropriately trained personnel to meet mission requirements within the following prioritized focus areas:

- Defense Operations
- Incident Response and Management
- Maritime Prevention and Response
- Maritime Security Operations
- Mission Support.

The USCG depends on its RC to be always ready to mobilize and respond to incidents with relevant competencies in boat operations, emergency management, expeditionary warfare, marine safety, port security, law enforcement, and mission support.

Units focused on defense support activities are primarily staffed by reservists. Port Security Units (PSUs) are a key RC capability of the USCG's Defense Operations program. PSUs are expeditionary units able to operate independently or in conjunction with joint, combined, and host nation security forces and often integrate with the Navy's Maritime Expeditionary Security Forces. The eight USCG PSUs are principally staffed with a RC complement of 137 reservists and supported by a full-time complement of six Active Component (AC) personnel. Also primarily staffed with reservists, the USCG Mobile Support Unit (MSU) provides an expeditionary logistics support capability and resources deployed in support of combatant

commanders. The MSU is air, sea, and land deployable within 96 hours after mobilization in support of contingencies domestic and abroad.

A. Coast Guard Planning Guidance

The USCG Strategic Framework is outlined in the Coast Guard Strategic Plan 2018–2022. It reflects and directly supports the National Security Strategy, DHS goals and priorities, and the National Military Strategy. To meet the nation's needs and address the most difficult maritime challenges, the Coast Guard must be nimble, adaptive, and anticipatory. The Coast Guard Strategic Plan 2018–2022 provides a framework for a Ready, Relevant, and Responsive Coast Guard which seeks to Maximize Readiness Today and Tomorrow; Address the Nation's Complex Maritime Challenges; and Deliver Mission Excellence Anytime, Anywhere.

The USCG will prepare to address future risks by ensuring the capability and capacity to respond simultaneously to (a) one nationally significant response operation, (b) one regional surge operation in a district, and (c) highest priority response operations locally. To be best prepared to adapt to this rapidly changing operating environment, the USCG has focused on six key strategic plans/outlooks representing the most pressing concerns of the USCG. The areas of focus are the result of a risk-informed approach based on the USCG understanding of the strategic landscape:

- Western Hemisphere Strategy: Combat networks, secure borders, and safeguard commerce
- Cyber Strategy: Defend cyberspace, enable operations, and protect infrastructure
- Human Capital Strategy: Meet the needs of our Mission, Service, and People
- Arctic Strategic Outlook: Improve awareness, modernize governance, and broaden partnerships in the polar regions
- Maritime Commerce Strategic Outlook: Facilitate lawful trade and travel, modernize aids to navigation and mariner information systems, and transform workforce capacity and partnerships
- Illegal, Unreported, and Unregulated Fishing Strategic Outlook: Apply broad authorities, capabilities, and partnerships to be a global leader in the fight against IUU fishing.

USCG Operational Plans will dictate required competency and capability requirements, which shall be integrated into the USCG Force Planning Construct to shape the size and composition of the current and future workforce.

Predictable and steady funding is critical to the USCG's ability to address these strategic priorities, especially within the RC. Sequestration and Budget Control Act impacts since FY 2013 have complicated efforts to reshape the RC to address surge mobilization requirements. Long-term strategic accession and training decisions can help mitigate operational risk across all mission areas requiring RC support now or anticipated in the future.

B. Coast Guard Equipping Policy

As an integrated workforce, the USCG AC owns and manages all equipment, including equipment allocated for the RC. The AC provides equipment for RC mobilizations or surge

operations using existing unit inventories, supporting units, or through procurement procedures using the USCG base budget programmed through the DHS budget.

C. Plan to Fill Equipment Shortages in the RC

In FY 2019, approximately 511 Selected Reserve (SELRES) personnel performed active duty in support of overseas contingency operations, a modest increase compared to FY 2018. In FY 2020 the personnel footprint for planned PSU missions will remain approximately 115 members per deployment to support mission requirements at Guantanamo Bay, Cuba. An accelerated timeline for recapitalizing personal protective equipment (PPE) is primary and essential. Future plans to recapitalize boat platforms will begin in FY 2021.

D. Initiatives Affecting RC Equipment

The number and location of USCG boat platforms continue to drive a more strategic allocation of AC and RC personnel resources to balance mission execution requirements and training availability to support mobilization readiness.

Likewise, new worldwide initiatives have increased cause for concern as new demands for RC worldwide deployment have shed light on the shortages in equipment needed to support such contingencies while maintaining existing statutory missions.

The SELRES is assigned to units supporting traditional USCG missions as well as to units providing defense support. At traditional units, reservists train and perform their duties alongside AC personnel. They obtain invaluable experience in their assigned mobilization competencies through the regular execution of daily operations to meet USCG missions. The Boat Forces Reserve Management Plan, in particular, established a ratio of reservists-to-platforms to ensure the effective training of assigned reservists. USCG operational planners determine more reservists with boat forces competencies are needed, additional analysis will be required to determine the appropriate number of platforms. The DoD-validated requirements for deployable USCG units, in both annually recurring defense operations and in potential contingency operations, far exceed the capacity of a fully mobilized USCG Reserve Force. Without significant AC augmentation, this RC limitation poses a significant to high military risk to using Reserve Forces in the event of an actual contingency.

II. Coast Guard Reserve Overview

A. Current Status of the Coast Guard Reserve

1. General Overview

Top Coast Guard Reserve Equipping Challenges

- Recapitalizing PPE
- Obtaining sufficient training capacity to ensure proficiency on updated platforms

The USCG RC Policy Statement calls for the RC to provide operationally capable and ready personnel with critical competencies vital to the USCG's capability to lead, manage, and coordinate the nation's response to acts of terrorism, disasters, or other emergencies in the maritime domain.

In FY 2019, the USCG successfully bridged a critical organizational gap between the field and management levels by establishing a new Assistant Commandant for Reserve at the headquarters level under the Deputy Commandant for Operations, streamlining insight, guidance, and governance for the RC. As such, the Assistant Commandant for Reserve has steered the new direction of the RC under three strategic priorities: Grow the Force, Get the Force Right, and Get the Support Right. These priorities have sparked the charter of three major initiatives that required a significant budget and capability review to determine the necessary funding, training, and equipment requirements needed to restore and sustain a fully employed RC at the authorized end-strength of 7,000 members. These three initiatives are:

Reserve End Strength Regeneration Action Team (RESAT): The RESAT is directed by the Vice Commandant, and chartered jointly by the Deputy Commandants for Operations and Mission Support, to evaluate the policy and resources required to restore the SELRES to its authorized strength of 7,000 by 30 September 2022.

Requirements Generation System (RGS): The RGS is a holistic cycle that systematically identifies mission requirements as often as changes in strategic priorities demand. The Strategic and Operational Planning layers of RGS encompass the Commandant's strategic priorities, provide an interpretation of those priorities through changing operational plans, and are ultimately used to identify the mission priorities expected of the RC. This information also serves as key input into the "Requirements Framework" used to determine the "unconstrained" resource requirements necessary to respond to planned contingencies.

Reserve Force Readiness System (RFRS 2.0): The "next generation" RFRS 2.0, the support structure necessary to ensure the RC's sustainability and continued success, requires holistic review. Reviewing the oversight of this vital support structure and the various aspects of the USCG Reserve will best position the RC to allocate these (and other) resources in support of a ready, relevant, and responsive USCG.

These initiatives are well underway, but it is very apparent that current appropriations may not support the training and equipment needs of a fully-employed RC. As the USCG's only dedicated surge force, the RC serves alongside AC members in support of DHS programs and all USCG missions. The RC has been described as, and remains, "contingency based." It is only able to support a limited set of prioritized mission areas.

The USCG Reserve Training Appropriation for FY 2020 provided $124.5 million for necessary expenses as authorized by law, which include operations; administration and maintenance of the RC; personnel and training costs; and services. The Reserve Training Appropriation does NOT provide funding for PPE and machinery assets such as boats, vehicles, boat engines, and rescue equipment and is limited by its inclusion within the USCG's top line budgetary limits set by the Office of Management and Budget and DHS.

2. Status of Equipment

a. Equipment On-hand

Table 1 Consolidated Major Item Inventory and Requirements identifies the major equipment inventories for FY 2022–FY 2024. The AC procures and accounts for all RC equipment.

The RC uses two main boat platforms, the Transportable Port Security Boat (TPSB) and the Response Boat–Small (RB-S).

USCG PSUs operate the TPSB for defense operations, providing waterborne security and port defense operations. The USCG operates a total of 58 Generation IV TPSBs at the PSUs, in Guantanamo Bay, Cuba, and at the Special Missions Training Center (SMTC) in Camp Lejeune, NC.

The RB-S serves as the primary training and employment platform for reservists assigned to USCG stations throughout the nation. The USCG has completed the recapitalization of its RB-S fleet with production of the 29′ RB-S II. There are 350 RB-S II boats operating throughout the USCG. They handle a wide range of Coast Guard missions close to shore, including search and rescue; law enforcement; Ports, Waterways, and Coastal Security (PWCS); drug and migrant interdiction; and environmental protection and response. The expected lifecycle for both RB-S platforms is 10 years. The first RB-S II was introduced to the fleet in 2012.

29′ RB-S II

32′ TPSB, Generation IV

b. Average Age of Major Items of Equipment

Table 2 Average Age of Equipment provides the projected average age of equipment at the start of FY 2021.

c. Compatibility of Current Equipment with AC

The PSUs' primary mission is supporting DoD expeditionary warfare and homeland defense under Title 10. The units are manned, trained, and equipped to provide point defense of strategic shipping and critical infrastructure, and antiterrorism–force protection in Level I and II threat conditions. The PSU's secondary mission is supporting PWCS under Title 14 authorities. Due to their unique mission requirements, TPSBs are maintained mostly at PSUs. However, SMTC maintains two TPSBs used to fulfill training requirements. Additional TPSBs were purchased solely for the Guantanamo Bay, Cuba, mission. The weapons systems and navigation packages require periodic maintenance, upgrades, and repairs. TPSB communications systems have capacities beyond those on standard USCG boat platforms to ensure compatibility with DoD during Title 10 operations.

All other platforms and equipment used by the RC are shared with the AC.

d. Maintenance Issues

The transition to the Generation IV TPSB was completed in 2014. The USCG purchased seven additional TPSBs in 2015 and has implemented a depot-level maintenance plan that continually rotates TPSBs out of theater to spread the operational hours evenly across the fleet and facilitate more involved maintenance. Enrollment of the TPSB into the USCG internal maintenance and repair program has helped ensure availability for training platforms. Parts availability in Guantanamo Bay has been adequate, but there is room for improvement. PSU leadership can request changes or additions to spare parts lists through the Small Boat Product Line (SBPL). SBPL has extended the service life of these boats to 15 years. The largest issue affecting the maintenance for these boats is the shortage of SELRES Machinery Technicians and active duty personnel to support the fleet. SELRES and Full-Time Support position requirements in the Engineering Division of the PSU are understrength pending additional resources.

e. Modernization Programs and Shortfalls

The USCG continues to aggressively pursue replacement of its aging boat platforms, weapons, and other equipment. Once procured and fielded, the RC will require additional training to become proficient on the new equipment and maintain operational readiness.

The USCG SBPL has achieved fully integrated logistics support for the RB-S II and TPSB Generation IV boat fleet. The RB-S II new acquisition will begin in FY 2024.

The TPSB replacement acquisition will begin by FY 2027 to meet the projected end of useful service life in 2030.

f. Overall Equipment Readiness

The USCG has made strides in the PSU community to recapitalize, upgrade, and standardize major equipment systems. However, a high operating tempo over the last 14 years, in support of expeditionary and domestic contingencies, has created a need to replace aging and rapidly degrading equipment. Continual use in a harsh deployed environment has demonstrated the need for asset rotation and depot-level maintenance plans to ensure continued viability. This program requires consistent funding of operation and maintenance accounts to ensure dollars are available

to conduct maintenance on the boat platform on a routine basis. Maximum availability of operational boats for maintaining tactical proficiency and weapons qualifications is imperative for RC personnel to attain required qualifications. The TPSB Generation IV is at the middle of its lifecycle, with an average age of approximately 8 years per platform. Maintenance funding for all eight PSUs is currently provided through Overseas Contingency Operations (OCO) funding ($11.4 million) and USCG Base funding ($2.8 million) and is critical to sustaining equipment required for expeditionary operations in support of Operational Plan deployments.

Maximizing the availability of operational platforms for RC training extends beyond concerns with maintenance cycles. The integrated nature of the USCG results in competition for available platform hours on non-organic resources for the Reserve. The prioritization between domestic mission execution and Reserve readiness training is understandably skewed toward mission execution. Unit training officers and Reserve managers coordinate training to the greatest extent possible, but unplanned mission requirements do reduce platform availability for training.

B. Changes since the Last NGRER

The Reserve Training Appropriation experienced slight growth in FY 2020, rising to $124.5 million from $117.7 million appropriated in FY 2019 and continuing a trend of modest increases.

The USCG was able to purchase the Tactical Field Lighting and Loading Ramps required to outfit all of the PSUs, addressing two previously reported significant major item shortfalls.

C. Future Years Program (FY 2022–FY 2024)

1. FY 2022 Equipment Requirements

*Table 1 Consolidated Major Item Inventory and Requirement*s provides projected FY 2022 through FY 2024 inventories and requirements for major equipment. All equipment is procured and accounted for by the AC.

2. Anticipated New Equipment Procurements

None are expected at this time.

3. Anticipated Withdrawals from RC Inventory

None are expected at this time.

4. Remaining Equipment Shortages and Modernization Shortfalls at the End of FY 2023

Table 1 Consolidated Major Item Inventory and Requirements and *Table 8 Significant Major Item Shortages* provide RC equipment inventories, shortfalls, and modernization requirements.

USCG unit operations and maintenance fund managers include PPE in annual budget requests. Funding for PPE is based on a five-year cycle, which provides the unit enough funding to fully outfit each member with new/serviceable equipment at the end of a five-year period. The five-year cycle was developed in part based on the equipment service life and member assignments or transfers.

The AC uses operation and maintenance funds to provide PPE for AC and RC personnel. The replacement cycle for AC personnel is three years while RC replacement occurs every five years. The Reserve Training Appropriation does not fund PPE for RC personnel. Approximately 4,700 filled positions, or 67 percent, of the RC have mobilization requirements requiring PPE to safely conduct USCG operations. To meet RC PPE requirements, the USCG must program $2.9 million for annual budget execution. However, in FY 2020, the Service only marked $1.130 million for this purpose (a $1.768 million shortfall). Funding for USCG PPE has not been indexed with inflation within the base budget; as a result, buying power is reduced over time. This reflects an internal, risk-based, USCG resource allocation decision which relies on the use of unallocated funds in other operations and maintenance accounts to reduce PPE gaps over time.

Table 6-2 details the FY 2021 PPE funding shortfall. It is important to note that PSUs have required personal equipment related to their expeditionary missions in addition to regular PPE. This additionally required equipment (ballistic protection, uniforms, and CBRN equipment) is purchased using OCO funds. FY 2021 Mission Essential Protective Equipment Warehouse funding, which supplies the required protective equipment, is anticipated to be cut by 50 percent, requiring mitigation of costs by USCG Pacific Area, which could cause additional shortfalls in field-level OCO funding. Should OCO funding be totally eliminated, the USCG will need to engage in a risk-based analysis to determine if maintaining this level of personal readiness is the most effective allocation of limited resources.

The absence of PPE funding can diminish Reserve mobilization readiness and negatively impact the ability to safely train. Reservists must be properly outfitted to safely perform USCG operations to achieve and maintain their mobilization competencies.

Table 6-2. Coast Guard FY 2021 PPE Funding for the RC

Unit/PPE Type	Cost	# of Personnel	Total per Five-Year Cycle	Total per Year (÷5)
Ashore (Reserve) Basic Ensemble (Boat Station)	$1,780	1,590	$2,830,200	$566,040
Ashore (Reserve) Cold Ensemble (Boat Station)	$1,854	1,025	$1,900,350	$380,070
Sector Ops (Reserve) Basic Ensemble	$1,780	414	$736,920	$147,384
Sector Ops (Reserve) Cold Ensemble	$1,854	287	$532,098	$106,420
Tactical (Reserve) Basic/Cold Ensemble (PSU)	$3,634	320	$1,162,880	$279,091
PSU Ballistic Protection Systems	$4,400	1,144	$5,033,600	$1,006,720
PSU MOPP 4	$2,000	1,144	$2,288,000	$457,600
PPE per Person Total		6,257	$14,484,048	$2,896,810
Total per 5 Year Cycle	$14,484,048			
Total per Year (÷5)	$2,896,810		Estimated FY21 Shortfall	
Total Dedicated to PPE in FY 2020	$1,130,588		($1,766,222)	

All members of the USCG must wear specific equipment when conducting law enforcement missions. The AC provides equipment to conduct these missions to both the AC and RC using individual unit operation and maintenance funds. As with PPE, the RC does not procure law enforcement gear for RC members. The cost to outfit each member is approximately $2,000.

D. Summary

The USCG depends on the Reserve force to be ready within 48 hours to mobilize with critical competencies in boat operations, contingency planning and response, expeditionary warfare, marine safety, port security, law enforcement, and mission support. The USCG RC is fully integrated with the AC. Both components collaboratively train and jointly conduct day-to-day operations. This ensures Reserve members are properly trained for contingency operations and allows the USCG RC to successfully augment the AC.

The USCG RC will continue to be an invaluable force, ready to perform the missions critical to maritime homeland security, national defense (domestic and expeditionary), and domestic disaster operations. Predictable and steady funding is critical to sustain USCG operational integration, which is essential to responding to various contingencies and fulfilling the security demands of the nation.

USCGR

Table 1

Consolidated Major Item Inventory and Requirements

NOTE: This table provides a comprehensive list of selected major equipment items. It provides the projected inventory quantity on-hand (QTY O/H) at the beginning/end of the selected fiscal year (FY). It also provides the quantity required (QTY REQ) to meet the full wartime requirements of the Reserve Component. In accordance with Title 10, the QTY REQ number provides the recommendation as to the quantity and type of equipment that should be in the inventory of each Reserve Component. FY 2021 unit cost estimates are provided by the Military Departments.

Nomenclature	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Port Security Units (PSU)						
AN/PRC-117G Wideband, Multiband, Multi-mission Tactical Boat Radio	$18,750	56	56	56	56	56
Fly Away Kit (Portable Satellite Communications Kit)	$5,329	4	4	4	4	4
AN/PRC-152A Wideband, Handheld, Networking Radio	$15,392	288	288	288	288	288
Power Amplifier RF-7800UL-V150 (1 per PRC-117G radio)	$20,000	32	32	32	32	32
M4-Variant Rifle	$1,100	956	956	965	956	956
SIG P229R DAK 9mm Pistol	$660	540	540	540	540	540
Deployable Medical Kits	$111,000	8	8	8	8	8
Portable Armory	$75,000	8	8	8	8	8
Portable loading ramps	$14,780	24	24	24	24	24
Portable Scales	$9,380	48	48	48	48	48
All Terrain Forklift	$171,000	8	8	8	8	8
Polytetrafluoroethylene 32' Transportable Port Security Boat (TPSB) Covers	$1,200	56	56	56	56	56
Vehicle, F550 Stake-bed (1 per unit)	$56,000	8	8	8	8	8
Vehicle, F450 Pickup (5 per unit)	$46,000	40	40	40	40	40
Generators with Distribution Panel	$44,000	24	24	24	24	24
32' Transportable Port Security Boat (TPSB)	$495,000	56	56	56	56	56
Utility Trailer (1 per unit)	$7,000	8	8	8	8	8
Searchlight Set	$7,700	8	8	8	8	8
Tactical Field Lighting Sets	$5,100	8	8	8	8	16
Counter, Frequency (DC to 500HHZCW)	$4,461	8	8	8	8	8
Analyzer, Communication	$4,390	8	8	8	8	8
Computer, Laptop	$4,000	16	16	16	16	16
Fuel Bladder 3K Gallons	$3,885	24	24	24	24	24
Water Buffalo	$47,000	8	8	8	8	8
Forklift (non all-terrain)	$42,000	8	8	8	8	8
Fuel Containment Boom	$2,200	24	24	24	24	32
ISU 90 Shipping Container	$8,600	176	176	176	176	176
Unity Triband Radio	$5,000	110	110	110	110	110
Base X Shelter (6D31)	$86,428	112	112	112	112	112
Water Bladder, 2K-gallon capacity	$8,776	8	8	8	8	8

USCGR

Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Palm Infrared, Thermal Imager	$9,450	0	0	0	0	16
USCG Boat Forces						
Response Boat-Small II (RB-S II)	$400,000	350	350	350	350	350
Mobile Support Units (MSU)						
Trailers, Tools / Equipment / Maintenance	$150,000	79	79	79	89	79
Truck, Stake-bed Class 8	$135,000	118	118	118	114	118
Truck, Stake-bed	$55,000	369	369	369	353	369
Generator, 240kW	$120,000	93	93	93	89	93
Forklift, 10,000 lb	$90,000	26	26	26	26	71
Forklift, Telescoping	$71,000	22	22	22	22	64
Trailer, Administrative Support	$86,463	19	19	19	19	18
Trailer, Maintenance Shop	$83,688	0	0	0	34	34
Trailer, Logistic Support Parts	$58,462	21	21	32	32	32
Trailer, Open Bulk Storage	$49,600	11	11	13	13	13
Trailer, 30ft Flatbed	$14,000	14	14	26	26	26
Portable Welding/Cutting Shops	$45,000	7	7	13	13	13
Generator, Magnum 25kW	$10,000	8	8	8	8	0
CONEX Boxes, 40' X 8'	$30,000	19	19	19	19	0
CONEX Boxes, 20' X 8'	$12,000	8	8	8	8	15
CONEX Boxes, 8' X 8'	$15,000	7	7	7	7	30
Power Distribution Center	$12,000	0	0	1	3	12
Air Craft Loading Ramp sets	$15,000	11	11	11	11	60
AC&R Repair and Service Kits	$10,000	29	29	29	29	25
DC Kit, Compressed Air - Diesel Powered	$9,000	163	163	163	1	163
DC Kit, Diesel Powered Welder	$3,000	564	564	564	564	713
Computer, Laptop	$2,000	103	103	103	103	319
Gator, 6X6 Diesel Terrain Vehicle	$6,500	6	6	6	6	9
Generator, Light Tower	$10,000	2	2	2	2	2
Generator, 46Kw	$33,000	4	4	4	4	6
Generator, 60Kw , Load Sharing	$35,000	0	0	0	0	1
Microgrid Feeder Kit 60Kw	$51,000	5	5	5	5	10
Base X Shelter (6D31) Command	$27,966	165	165	165	109	165
Base X Shelter (505) Maintenance	$24,190	12	12	12	12	54
Drash Shelter (6S)	$18,300	4	4	5	165	5
Alaska Tent Kit (Includes ECU)	$40,000	1	1	2	5	0
Environmental Control Unit (ECU), Drash	$92,131	184	184	184	2	281
Loading Scale Kit	$16,000	204	204	204	184	558

USCGR

Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Unit Cost	Begin FY 2022 QTY O/H	Begin FY 2023 QTY O/H	Begin FY 2024 QTY O/H	End FY 2024 QTY O/H	End FY 2024 QTY REQ
Special Missions Training Center (SMTC)						
AN/PRC-117G Wideband, Multiband, Multi-mission Tactical Boat Radio	$18,750	60	60	60	60	60
Fly Away Kit (Portable Satellite Communications Kit)	$5,329	4	4	4	4	4
AN/PRC-152A Wideband, Handheld, Networking Radio	$15,392	25	25	25	25	25
Water Buffalo	$47,000	2	2	2	2	2
32' Transportable Port Security Boat	$495,000	2	2	2	2	2
Environmental Control Unit (ECU), HP-2C/338 IPT	$130,497	4	4	4	4	4
Base X Shelter (6D31)	$27,966	1	1	1	1	1
Base X Shelter (505)	$24,190	1	1	1	1	1
Base X Shelter (307)	$18,445	4	4	4	4	4
Base X Shelter (305)	$13,008	8	8	8	8	8
Base X Shelter (203)	$8,392	3	3	3	3	3
Trailer, Tank	$12,955	1	1	1	1	1
ISU 90 Shipping Container	$8,600	5	5	5	5	5
Portable Observation Post	$65,000	0	2	2	2	2
Computer, Laptop	$2,000	5	5	5	5	5
UTV, 6X6 Diesel Terrain Vehicle	$15,000	3	3	3	3	3
TCCC Tommaniquian	$40,000	2	2	2	2	2
* The AC manages all equipment for the Coast Guard Total Force.						

USCGR
Average Age of Equipment

Table 2

NOTE: This table provides the average age of selected major equipment items. The average age provides a projected average age of the fleet at the start of FY 2021.

Nomenclature	Average Age	Remarks
Port Security Units (PSU)		
32' Transportable Port Security Boat (TPSB)	9	
Radio Set AN/PRC-117G	7	
AN/PRC-152A Wideband, Handheld, Networking Radio	9	
Unity Triband Radio	5	
Portable Armory	8	
All Terrain Forklift	6	
All Terrain Vehicle, Gator (1 per unit)	7	
Vehicle, F550 Stake-bed (1 per unit)	9	
Vehicle, F450 Pickup (5 per unit)	9	
Generator 125kW with distro panel (3 per unit)	9	
Counter, Frequency (DC to 500HHZCW)	17	
Analyzer, Communication	15	
Fuel Bladder 3K Gallon	14	
Fuel Containment Boom	9	
Tactical Field Lighting Sets	11	
Aircraft loading ramps	9	
Water Buffalo (1 per unit)	5	
ISU 90 Shipping Container	10	
Base X Shelters (14 per PSU)	5	
USCG Boat Forces		
Response Boat Small RB-S II	5	
Mobile Support Units (MSU)		
Truck, Stake-bed Class 8	4	
Truck, Stake-bed	1	
Gator, 6X6 Diesel Terrain Vehicle	11	
Generator, 240kW	14	
Generator, Light Tower	2	
Generator, Magnum 25kW	14	
Generator, Microsilent 12kW	17	
Forklift, 10,000 lb	16	
Trailers, Tools / Equipment	13	
Trailer, Administrative Support	12	
Trailer, Logistic Support Parts	12	
Trailer, Maintenance Shop	12	
Trailer, Open Bulk Storage	12	
Computer, Laptop	4	

USCGR

Table 2

Average Age of Equipment

Nomenclature	Average Age	Remarks
Portable Welding/Cutting Shops	14	
CONEX Boxes, 40' X 8'	21	
CONEX Boxes, 20' X 8'	8	
CONEX Boxes, 8' X 8'	16	
Power Distribution Center	7	
AC&R Repair and Service Kits	11	
DC Kit, Compressed Air - Diesel Powered	2	
DC Kit, Diesel Powered Welder	12	
Environmental Control Unit (ECU), HP4-DL	15	
Base X Shelter (6D31) Command	15	
Base X Shelter (505) Maintenance	15	
Drash Shelter (6S)	15	
Forklift, Telescoping	2	
Generator, 46Kw	2	
Generator, 60Kw, Load Sharing	1	
Microgrid Feeder Kit 60Kw	4	
Alaska Tent Kit (Includes ECU)	2	
Loading Scale Kit	2	
Air Craft Loading Ramp sets	3	
Special Missions Training Center (SMTC)		
32' Transportable Port Security Boat (TPSB)	7	
Environmental Control Unit (ECU), HP-2C/338 IPT	6	
Base X Shelter (6D31)	11	
Base X Shelter (505)	11	
Base X Shelter (307)	11	
Base X Shelter (305)	11	
Base X Shelter (203)	11	
Trailer, Tank	17	
ISU 90 Shipping Container	10	

USCGR

Service Procurement Program - Reserve (P-1R)

NOTE: This table identifies the dollar value of programmed equipment procurement as identified in the P-1R exhibit of the FY 2022 President's Budget Request. All values are costs in dollars and exclude ammunition procurements. Deliveries of procured equipment normally take one to two years before they arrive in the inventory; e.g., items procured in FY 2022 are expected to arrive in RC inventories in FY 2023 or FY 2024.

Nomenclature	FY 2022	FY 2023	FY 2024

Table 3 not applicable for USCGR

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

NOTE: This table identifies the dollar value of planned equipment procurements with the National Guard and Reserve Equipment Appropriation (NGREA). These funds are available for a three-year period from the year of appropriation. Deliveries of procured equipment normally take one to two years from date of procurement before they arrive in the inventory; e.g., items procured in FY 2021 would be expected to arrive in RC inventories in FY 2022 or FY 2023. All values are costs in dollars.

Nomenclature	FY 2019	FY 2020	FY 2021

Table 4 not applicable for USCGR

USCGR
Projected Equipment Transfer/Withdrawal Quantities

NOTE: This table portrays the planned equipment transfers (Active to Reserve), withdrawals (-), and decommissioning (-). Transferred equipment is commonly called "cascaded equipment," or equipment that is provided to the RC once the AC receives more modern equipment. Although this table highlights a three-year period, many Services will not know exact quantities of transfers or withdrawals until year of execution, due to the uncertainty of the procurement/delivery cycle of new equipment.

Nomenclature	Equip No.	FY 2022 Qty	FY 2023 Qty	FY 2024 Qty	Remarks

Service has no planned transfers or withdrawals for the years FY 2022 thru FY 2024.

USCGR

Table 6

FY 2018 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2018 with actual procurements and transfers. FY 2018 is selected as these are the most recent funds to expire. Because the procurement cycle is normally one to two years from funding to delivery, this table identifies only deliveries through the end of FY 2018. Procurement and NGREA columns reflect cost values in dollars.

Nomenclature	Equip No.	FY 2018 Transfers (# of items)		FY 2018 Procurements ($s)		FY 2018 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual

USCGR had no planned or actual transfers or procurements of major equipment during FY 2018.

USCGR

Table 7

Major Item of Equipment Substitution List

NOTE: This table identifies equipment authorized by the Service to be used as a substitute for a primary item of equipment. The table also identifies whether or not the item is deployable in wartime. This data meets the Title 10 requirement to identify substitutes that are not the most desired equipment item.

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2022 Qty	Deployable?	
					Yes	No

Service Does Not Use Substitution to Satisfy Major Item Equipment Requirements.

USCGR

Table 8

Significant Major Item Shortages

NOTE: This table provides a RC top ten prioritized (PR) shortage list for major equipment items required for wartime missions. It lists the total quantity required, the shortfall, the individual item cost, and the total cost of the shortfall. This data is consistent with other equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items[1] Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Palm Infrared, Thermal Imager	16	16	$9,450	$151,200	Needed for PSU Shoreside Security Divisions to maintain perimeter security and entry control points for life support areas (base camps).
2	Tactical Field Lighting Sets	16	8	$5,100	$40,800	2 sets required by each PSU for tactical Safety and Security
3	Fuel Containment Boom	32	8	$2,200	$17,600	3 sets required by each PSU for air/sea/rail mobility and adherance to USAF requirements.
4	Portable Observation Post	2	2	$65,000	$130,000	2 required by Training Center for tactical safety and field observation.

1. Shortage items are required for AC recapitalization of outdated equipment.
The AC manages all equipment for the Coast Guard Total Force.

Appendix A
Report Requirements, Terminology, and Definitions

I. Report Requirements

A. Overview of Statutory Requirement

The DoD Authorization Act of 1982 (Public Law 97-86), as amended, established the requirement for DoD to provide an annual report to the Congress, by March 15th of each year, on the status of National Guard and Reserve equipment; hereafter referred to as the NGRER. The Goldwater-Nichols DoD Reorganization Act of 1986 amended Title 10 of the United States Code (U.S.C.) placing the reporting requirement under Section 115(b). The Congress in Public Law 103-337 transferred reporting requirements to a new Subtitle E, Reserve Components, Part I, Chapter 1013, which was re-designated Section 10541. In compliance with the FY 1993 National Defense Authorization Act (NDAA), Section 1134, Title XI, the NGRER was expanded to include a description of the current status of equipment incompatibility between the Active Component (AC) and Reserve Component (RC), the effect of that level of incompatibility, and the plan to achieve full compatibility. Finally, the FY 2008 NDAA, Sections 351(a), 351(c)(1), and 1826 added additional National Guard equipment reporting requirements to the NGRER. Sections 351(a) and 351(c)(1) added the requirement for an assessment of the extent to which the National Guard possesses the equipment required to suppress insurrections (10 U.S.C. §§ 251–253), provide assistance in cases of weapons of mass destruction or terrorist attacks (10 U.S.C. § 12304(b)), or to repel invasions, suppress rebellions, or execute the laws of the United States (10 U.S.C. § 12406) in an emergency or major disaster. Section 1826 of the FY 2008 NDAA also required a statement of the accuracy of past National Guard equipment inventory projections, and a certification from the Chief of the National Guard Bureau setting forth the inventory of equipment items that were due to be procured in the preceding fiscal year, but were not received.

This report is prepared by the Office of the Assistant Secretary of Defense for Readiness with the assistance of the Department of the Army, the Department of the Navy, the Department of the Air Force, and the Department of Homeland Security (United States Coast Guard).

B. Current Law

The section below is an excerpt from Section 10541, Title 10, U.S.C. Changes required by the FY 2008 NDAA are highlighted.

National Guard and Reserve Component Equipment: Annual Report to Congress

(a) The Secretary of Defense shall submit to the Congress each year, not later than March 15, a written report concerning the equipment of the National Guard and the reserve components of the armed forces for each of the three succeeding fiscal years.

(b) Each report under this section shall include the following:

(1) Recommendations as to the type and quantity of each major item of equipment which should be in the inventory of the Selected Reserve of the Ready Reserve of each reserve component of the armed forces.

(2) A statement of the quantity and average age of each type of major item of equipment which is expected to be physically available in the inventory of the Selected Reserve of the Ready Reserve of each reserve component as of the beginning of each fiscal year covered by the report.

(3) A statement of the quantity and cost of each type of major item of equipment which is expected to be procured for the Selective Reserve of the Ready Reserve of each reserve component from commercial sources or to be transferred to each such Selected Reserve from the active-duty components of the armed forces.

(4) A statement of the quantity of each type of major item of equipment which is expected to be retired, decommissioned, transferred, or otherwise removed from the physical inventory of the Selected Reserve of the Ready Reserve of each reserve component and the plans for replacement of that equipment.

(5) A listing of each major item of equipment required by the Selected Reserve of the Ready Reserve of each reserve component indicating -

(A) the full war-time requirement of that component for that item, shown in accordance with deployment schedules and requirements over successive 30-day periods following mobilization;

(B) the number of each such item in the inventory of the component;

(C) a separate listing of each such item in the inventory that is a deployable item and is not the most desired item;

(D) the number of each such item projected to be in the inventory at the end of the third succeeding fiscal year; and

(E) the number of non-deployable items in the inventory as a substitute for a required major item of equipment.

(6) A narrative explanation of the plan of the Secretary concerned to provide equipment needed to fill the war-time requirement for each major item of equipment to all units of the Selected Reserve, including an explanation of the plan to equip units of the Selected Reserve that are short of major items of equipment at the outset of war.

(7) For each item of major equipment reported under paragraph (3) in a report for one of the three previous years under this section as an item expected to be procured for the Selected Reserve or to be transferred to the Selected Reserve, the quantity of such equipment actually procured for or transferred to the Selected Reserve.

(8) A statement of the current status of the compatibility of equipment between the Army reserve components and active forces of the Army, the effect of that level of incompatibility on combat effectiveness, and a plan to achieve full equipment compatibility.

(9) (Added by FY 2008 NDAA, Sections 351(a) and 351(c)(1)) An assessment of the extent to which the National Guard possesses the equipment required to perform the responsibilities of the National Guard pursuant to sections 331, 332, 333, 12304(b) and 12406 of this title in response to an emergency or major disaster (as such terms are defined in section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5122)). Such assessment shall–

(A) identify any shortfall in equipment provided to the National Guard by the Department of Defense throughout the United States and the territories and possessions of the United States that is likely to affect the ability of the National Guard to perform such responsibilities;

(B) evaluate the effect of any shortfall on the capacity of the National Guard to perform such responsibilities in response to an emergency or major disaster that occurs in the United States or a territory or possession of the United States; and

(C) identify the requirements and investment strategies for equipment provided to the National Guard by the Department of Defense that are necessary to plan for a reduction or elimination of any such shortfall.

(c) Each report under this section shall be expressed in the same format and with the same level of detail as the information presented in the annual Future Years Defense Program Procurement Annex prepared by the Department of Defense.

(d) (Added by FY 2008 NDAA, Section 1826) Each report under this section concerning equipment of the National Guard shall also include the following:

(1) A statement of the accuracy of the projections required by subsection (b)(5)(D) contained in earlier reports under this section, and an explanation, if the projection was not met, of why the projection was not met.

(2) A certification from the Chief of the National Guard Bureau setting forth an inventory for the preceding fiscal year of each item of equipment–

(A) for which funds were appropriated;

(B) which was due to be procured for the National Guard during that fiscal year; and

(C) which has not been received by a National Guard unit as of the close of that fiscal year.

(10) (Added by FY 2019 NDAA, Section 111) National Guard and Reserve Component Equipment Report

(a) IN GENERAL.—Section 10541(b) of title 10, United States Code, is amended by adding at the end the following new paragraph:

''(10) A joint assessment by the Chief of Staff of the Army and the Chief of the National Guard Bureau on the efforts of the Army to achieve parity among the active component, the Army Reserve, and the Army National Guard with respect to equipment and capabilities. Each assessment shall include a comparison of the inventory of high priority items of equipment available to each component of the Army described in preceding sentence, including—

''(A) AH–64 Attack Helicopters;

''(B) UH–60 Black Hawk Utility Helicopters;

''(C) Abrams Main Battle Tanks;

''(D) Bradley Infantry Fighting Vehicles;

''(E) Stryker Combat Vehicles; and

''(F) any other items of equipment identified as high priority by the Chief of Staff of the Army or the Chief of the National Guard Bureau.''

II. Report Objective

Based upon the law, the Office of the Assistant Secretary of Defense for Readiness (Readiness Programming and Assessment), with concurrence from all Services, has identified the following objectives:

- Provide the Services' plan to equip their Reserve forces in a time of constrained DoD budgets.
- Concentrate on FY 2021–FY 2023 RC requirements, procurements, and changes.
- Provide an overview of current RC equipment from three perspectives:
  - current status of equipment on-hand.
  - future year equipment procurements for FY 2021–FY 2023
  - remaining shortfall for FY 2023 and beyond.
- Focus primarily on major items of equipment.

III. Report Contents

A. Overview (Chapter 1)

Chapter 1 presents a composite DoD perspective on National Guard and Reserve equipment and serves as the executive summary of the report.

B. Service Narratives and Data Tables (Chapters 2–6)

Chapters 2 through 6 present the status of each Service and their respective RC in terms of RC equipping policies and methodologies. Each chapter contains a Service and RC overview, and includes a discussion of current equipment status, future equipment procurements, and remaining shortfalls and unfunded requirements. Each chapter includes a review of the current status of equipment compatibility and interoperability between the AC and the RC of each Service, the

effect of that level of compatibility/interoperability, and a plan to achieve full compatibility/interoperability.

RC data tables for each Service contain specific information on major items of equipment selected for review in this report and are placed at the end of each RC narrative section. The NGRER articulates data in eight tables (*Tables 1-8*) for each RC. In a situation where data tables are not applicable to a particular RC, a blank page has been inserted to note that table data is not applicable. The "Data Table Explanation" at the end of this section defines the data contained in *Tables 1-8*.

IV. Terminology and Definitions

Major Items of Equipment include aircraft, tanks, ships, trucks, engineer equipment, and major items of support equipment. These items normally will include large dollar value requirements, critical RC shortages, Service and National Guard and Reserve Equipment Appropriation (NGREA) procured items, and any RC specific item which the Chief of the specific RC wishes to highlight.

Required Quantity is the total number of an item required to be on-hand or available to RC units to go to war and accomplish their missions. This includes requirements for war reserve and other stocks. The simplified term "requirement," as used in this report, is synonymous with "full wartime requirement," and satisfies the requirement in Title 10 to provide a "recommendation" as to the type and quantity of equipment needed in RC inventories.

On-hand Quantity is the equipment physically on-hand in RC or AC units or in war reserve and other stocks specifically designed for wartime use by the RC or AC.

Deployable Item is an item which, considering its suitability, operability, compatibility, and supportability, will provide an expected degree of mission success sufficient to warrant its wartime operational employment.

Compatibility/Interoperability denotes the capability of two items of equipment to operate together in the same environment without interfering with one another and without degrading function or unit capability.

Substitute Item is not the most desired item but based upon its capability can be employed in wartime in lieu of a combat essential required item of equipment. It may not function at the same level of capability as the item in the AC for which it is the substitute.

Equipment Shortage (Shortfall) is the difference between the quantity required and the quantity on-hand, excluding substitute items and excess quantities beyond the required quantity.

Modernization Shortfall is the difference between the required quantity of the most modern item and the on-hand quantity of that item. Modernization shortfalls are not necessarily equipment shortages as most Services substitute older versions of an item for the most modern item. Therefore, modernization shortfalls are shortages of the most modern item only, and can have a significant effect upon compatibility and interoperability.

V. Data Tables

A. Table Contents

A separate set of Data Tables (*Tables 1-8*) is provided in Chapters 2 through 6 for each RC. These tables contain the required information relative to major items of equipment identified in the report. The following list identifies the separate data tables that are included in the report for each RC.

- Table 1: Consolidated Major Item Inventory and Requirements (This is an all-inclusive table while other tables are subsets of Table 1.)
- Table 2: Average Age of Equipment
- Table 3: Service Procurement Program - Reserve (P-1R)
- Table 4: National Guard and Reserve Equipment Appropriation (NGREA) Procurements
- Table 5: Projected Equipment Transfer/Withdrawal Quantities
- Table 6: FY 2018 Planned vs Actual Procurements and Transfers
- Table 7: Major Item of Equipment Substitution List
- Table 8: Significant Major Item Shortages

B. Table Explanations

The following paragraphs provide an explanation of the data table columns and data criteria by Table.

Table 1: Consolidated Major Item Inventory and Requirements. This table provides a comprehensive list of selected major items of equipment the RC chooses to highlight, by providing key administrative data, on-hand inventories, and wartime requirements.

RC is the specific Reserve or National Guard entity, i.e., ARNG, USAR, USMCR, ANG, AFR, USNR, or USCGR.

Nomenclature is the description or common name of the item of equipment.

Equipment Number is the individual Service equipment identification code: Line Item Number for the Army; Table of Authorized Materiel Control Number for the Marine Corps; Equipment Cost Code for Navy engineering items; and National Stock Number for the Air Force.

Cost is the FY 2021 procurement cost per unit. If an item is no longer being procured, the inflation adjusted cost from the last procurement is shown. If an item is programmed for initial procurement beyond FY 2022, the data table depicts the projected unit cost at the time of procurement.

Quantity On-hand (QTY O/H) is the actual/projected item count for a particular item of equipment at a specified time.

Quantity Required (QTY REQ) is the authorized wartime requirement for a given item of equipment.

Table 2: Average Age of Equipment. This table is a subset of *Table 1* and highlights the average age of selected items of equipment.

Average Age is the calculated age of a given item of equipment. Since equipment is normally procured over several years, this figure provides an average age of the fleet at the start of FY 2021.

Table 3: Service Procurement Program–Reserve (P-1R). This table highlights items of equipment, which the Service intends to procure for their RC. The source of this data is the P-1R exhibit to the President's Budget.

Table 4: National Guard and Reserve Equipment Appropriation (NGREA) Procurements. This table highlights the items, which the RC plan on procuring with miscellaneous NGREA funds. Since these funds are available for 3 years, this table highlights items in the current procurement cycle.

Table 5: Projected Equipment Transfer/Withdrawal Quantities. This table portrays the planned equipment transfers (AC to RC), withdrawals, and decommissioning. Transfers are commonly called "cascaded" equipment or equipment that is provided to the RC once the AC receives more modern equipment items. Although this table highlights a 3-year period, many Services do not know exact quantities of transfers or withdrawals until year of execution because of the uncertainty of the procurement/delivery cycle of new equipment.

Table 6: FY 2016 Planned vs Actual Procurements and Transfers. This table compares what the Service planned to procure and transfer to the RC in FY 2017 with actual procurements and transfers. Because the procurement cycle is normally 1 to 3 years from funding to delivery, this table identifies only what has been delivered through the end of FY 2019.

Planned Quantity is the item quantity the Service programmed to deliver to the RC as part of the budgeting process.

Actual Quantity is the item quantity the Service actually delivered or has in the procurement cycle to deliver to the RC.

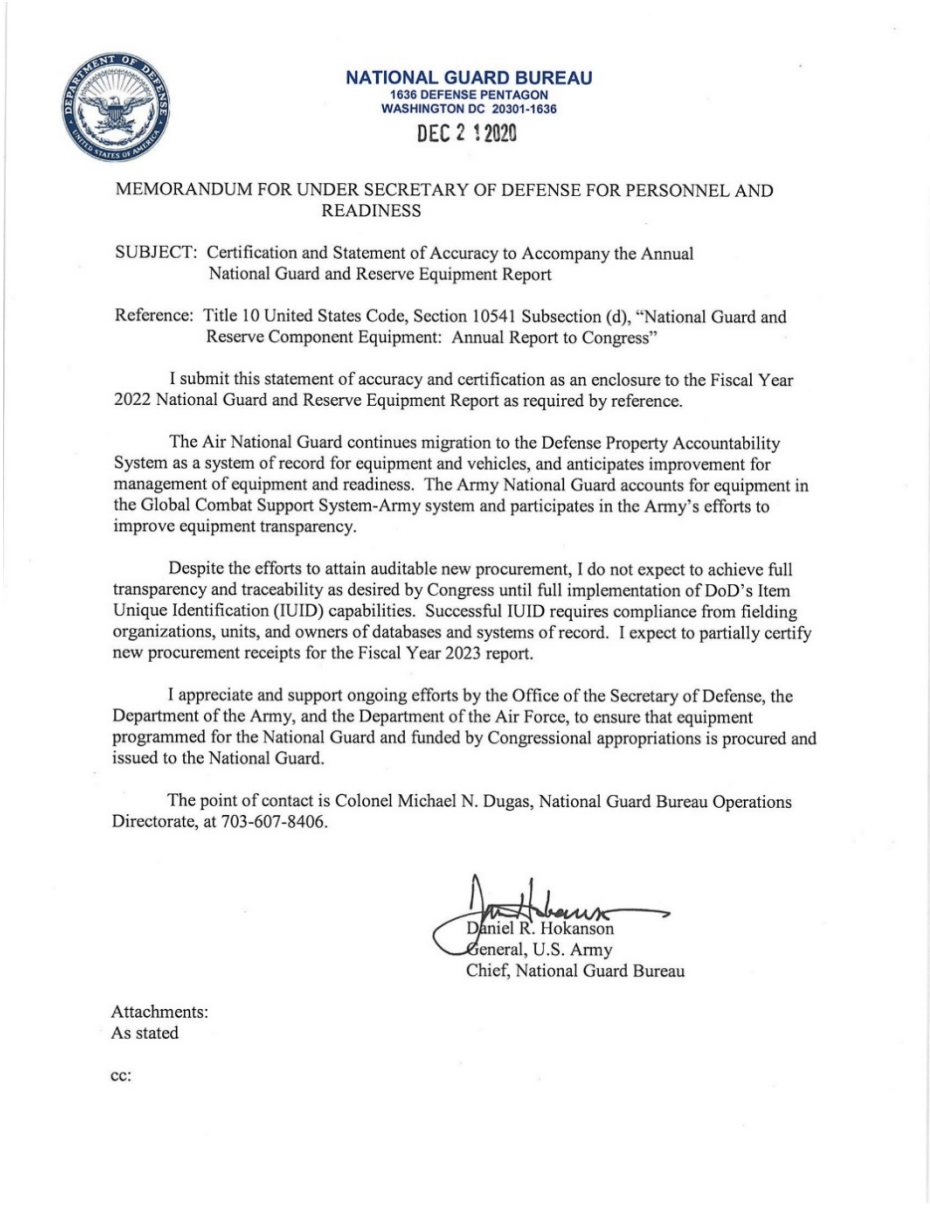
Table 7: Major Item of Equipment Substitution List. A list of equipment authorized by the Service to be used as a substitute for a primary item of equipment. This table also identifies whether this substitute item is suitable for deployment in time of war.

Nomenclature (Required Item/Substitute Item), see *Table 1* description for nomenclature.
Equipment Number (Required Item/Substitute Item), see *Table 1* description for equipment number.

Table 8: Significant Major Item Shortages. The top ten items of equipment and modernization/upgrades, which are not funded in the FY 2022–FY 2024 Future Years Defense Program, are listed in this table in priority order. If additional funds were to become available, the RC would apply those funds to the highest priority item on this list.

Appendix B
National Guard Equipment Reporting Requirements

This appendix provides the Department of Defense (DoD) response to section 10541(b)(9) of title 10, U.S.C. requirement for an assessment of the equipment necessary and available for the National Guard (NG) to perform certain specified federal missions in response to an emergency or major disaster in the U.S. (Section I) and the requirement for the Chief of the National Guard Bureau (CNGB) to provide a statement of accuracy on equipment projections and delivery of equipment procured the previous year in accordance with section 10541(d) of Title 10, U.S.C.



NATIONAL GUARD BUREAU
1636 DEFENSE PENTAGON
WASHINGTON DC 20301-1636

DEC 2 1 2020

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR PERSONNEL AND READINESS

SUBJECT: Certification and Statement of Accuracy to Accompany the Annual National Guard and Reserve Equipment Report

Reference: Title 10 United States Code, Section 10541 Subsection (d), "National Guard and Reserve Component Equipment: Annual Report to Congress"

I submit this statement of accuracy and certification as an enclosure to the Fiscal Year 2022 National Guard and Reserve Equipment Report as required by reference.

The Air National Guard continues migration to the Defense Property Accountability System as a system of record for equipment and vehicles, and anticipates improvement for management of equipment and readiness. The Army National Guard accounts for equipment in the Global Combat Support System-Army system and participates in the Army's efforts to improve equipment transparency.

Despite the efforts to attain auditable new procurement, I do not expect to achieve full transparency and traceability as desired by Congress until full implementation of DoD's Item Unique Identification (IUID) capabilities. Successful IUID requires compliance from fielding organizations, units, and owners of databases and systems of record. I expect to partially certify new procurement receipts for the Fiscal Year 2023 report.

I appreciate and support ongoing efforts by the Office of the Secretary of Defense, the Department of the Army, and the Department of the Air Force, to ensure that equipment programmed for the National Guard and funded by Congressional appropriations is procured and issued to the National Guard.

The point of contact is Colonel Michael N. Dugas, National Guard Bureau Operations Directorate, at 703-607-8406.

Daniel R. Hokanson
General, U.S. Army
Chief, National Guard Bureau

Attachments:
As stated

cc:

Figure B-1. Chief, National Guard Bureau Memorandum

I. National Guard Overview

The NG is constitutionally unique and fulfills two key roles: the primary combat reserve of the Army and the Air Force (AF) and the first military responder in the homeland. The primary mission of the NG is fighting America's wars. The NG focuses on improving readiness and lethality of forces in support of the National Defense Strategy (NDS).

Since the first Gulf War and because of the ongoing DoD missions in Afghanistan and Iraq, the NG has transformed from a strategic reserve to an operational force. The 2018 NDS refocuses the DoD for long-term competition with China and Russia. The NDS portrays China and Russia as dominant competitors, while Iran, North Korea, and non-state actors remain national security threats. The Soldiers and Airmen of the NG contribute 20 percent of the entire joint force, providing strategic depth in support of combatant commands. The NG must remain a ready and well-equipped operational force, part of the active Army and AF, to help protect and secure interests at home and abroad.[1]

A. National Guard Readiness for Emergencies and Major Disasters in the U.S.

In the 2020 National Guard Posture Statement, CNGB reiterates that the National Guard Priority #1 is Readiness. "I have laid out three priorities to achieve the objectives of the NDS and our three core missions of warfight, homeland, and partnerships—provide ready forces to the President and our Governors, take care of and develop our people, and promote an innovative culture."[2]

All aspects of NG resources and preparation to fulfill wartime missions also posture the units for effective domestic response. The organization, training, leader skills, exercise and operations experience, equipment, facilities, and full-time support enable a force that capably responds to domestic missions. The year 2020 provided the NG the challenge and the opportunity to demonstrate the full spectrum of domestic response capability, concurrent with ongoing overseas missions. On 5 June 2020, the NG's engagement peaked with a total of 118,376 personnel on duty for domestic response or Title 10 deployments in support of Combatant Commanders. On that day, the NG had 41,506 personnel supporting their communities during civil disturbance, 37,485 Soldiers and Airmen supporting the lead federal agency in the fight against COVID-19, 29,156 supporting Combatant Commanders outside the U.S., 7,772 supporting ongoing Homeland Defense and domestic response missions, and 2,457 serving on the Southwest Border. Many of these efforts continue through the remainder of the year. The 2020 hurricane season set a record with 12 named storms hitting the eastern U.S. and a record number of acres burned in the west.

The NG remains the first military force to assist first responders in the states and territories and the District of Columbia. The NG reinforces the connection between the American people and their military. Guard members are located in nearly every ZIP code, providing ready forces and

[1] *2020 National Guard Bureau Posture Statement*, p. 4.
[2] *2020 National Guard Bureau Posture Statement*, p. 11.

unmatched capabilities in a domestic emergency response. The NG helps save more lives and property because it requires less time and distance to respond.[3]

NG capability must increase across all equipment platforms. Parity in equipping in the Guard is essential to deliver the lethality that the NDS requires from the Joint Force. The previous model of cascading older equipment from the active duty to the NG, used when the Guard was a strategic reserve rather than operational force, no longer supports readiness. The NDS underscores the fact that new technologies and weapons can reach the heart of America with little or no warning. The lines are blurred between domestic and overseas threats, with many of these threats transcending regions and domains of warfare. Equipping is a critical factor in the NG response, as is enhancing full-time support and replacing/upgrading dilapidated facilities.

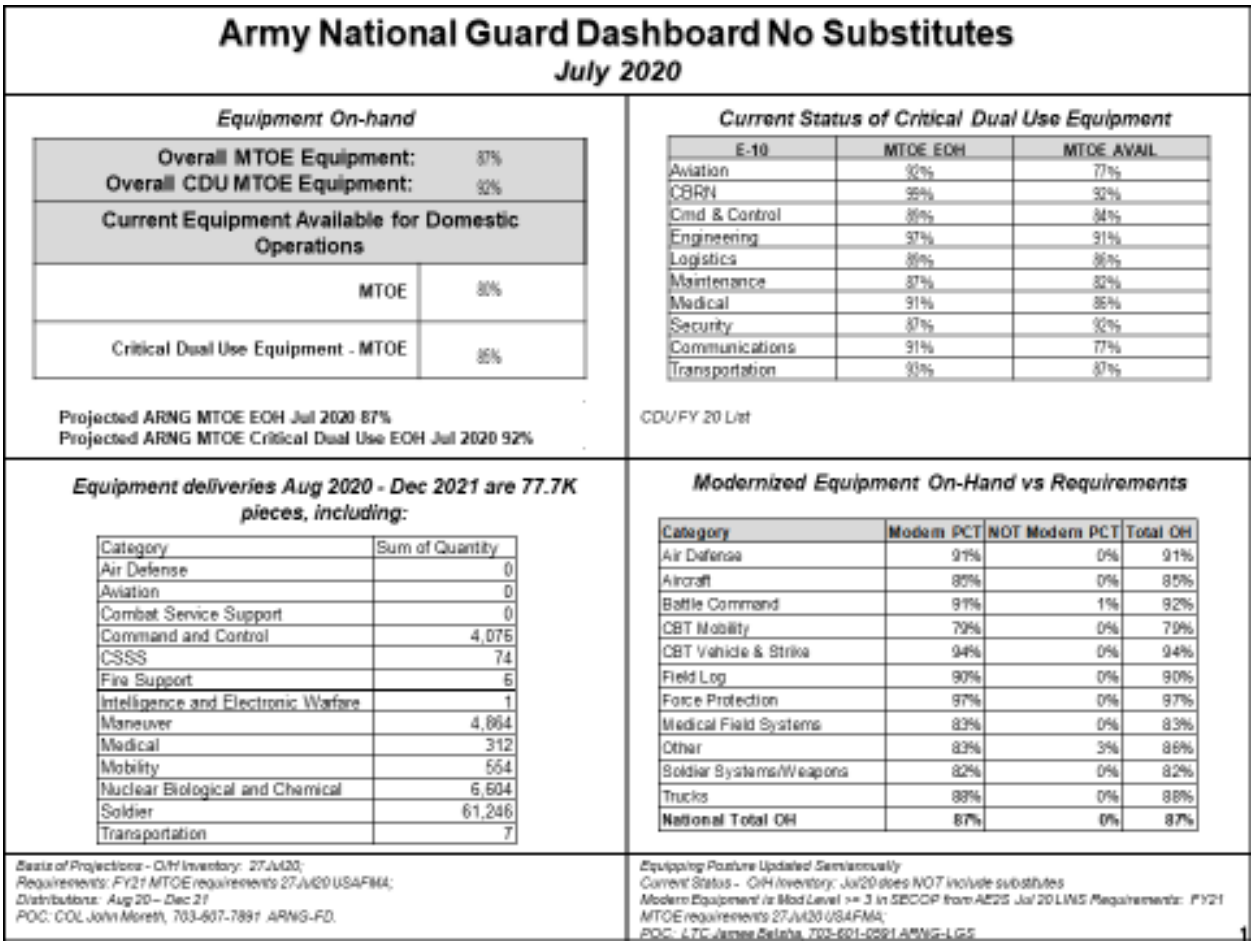
"As 2020 has shown us time and again, our work is invaluable to our communities, states, and nation—and we have plenty of work to do," said Army Gen. Daniel Hokanson, who was sworn in as the NGB's 29th CNGB in August 2020. "I believe this is an important and pivotal time in [the Guard's] history, and what we do now, and what we do next, will ultimately shape the nation's future."[4]

B. Army National Guard Equipment

The Army National Guard Dashboard (see Figure B-2) presents a snapshot of Army National Guard (ARNG) equipment on-hand (EOH); Critical Dual Use (CDU) equipment by Essential 10 Capabilities; projected equipment fielding impact from August 2020 through December 2021; and EOH of Modernized versus non-Modern equipment. As of July 2020, the ARNG EOH for the Modified Table of Organization and Equipment (MTOE)–required equipment stood at 87 percent overall and at 92 percent for the MTOE CDU equipment subset. A further breakdown of overall MTOE EOH and CDU EOH is provided for equipment available to the governors for domestic operations (DOMOPS), with MTOE EOH at 80 percent and CDU EOH at 85 percent. Equipment unavailable to the governors is primarily a result of Title 10 mobilizations. EOH percentages fluctuate due to force structure changes, but should be stable because EOH is aggregated at the state and national levels. Year-to-year CDU percentage variations are primarily caused by changes in the CDU list of equipment. This year, the EOH percentage is calculated without using substitutions, which reduced EOH compared to the percentages from previous years. Specific CDU areas of concern include Chemical, Biological, Radiological, Nuclear (CBRN), Engineering, Logistics, and Transportation capabilities.

The Army recognizes the need to track Modernized EOH. Measuring the Army's modern inventory against requirements without substitutes defines modernization progress and the equipment modernization of the force at the aggregate and component levels. In July 2020, 87 percent of the ARNG's required equipment meets the desired modernization level.

[3] *2020 National Guard Bureau Posture Statement,* p. 22.
[4] *CNGB Statement during Senate Confirmation Hearing,* 18 June 2020.



Army National Guard Dashboard No Substitutes

July 2020

Equipment On-hand

Overall MTOE Equipment:	87%
Overall CDU MTOE Equipment:	92%
Current Equipment Available for Domestic Operations	
MTOE	88%
Critical Dual Use Equipment - MTOE	85%

Projected ARNG MTOE EOH Jul 2020 87%
Projected ARNG MTOE Critical Dual Use EOH Jul 2020 92%

Current Status of Critical Dual Use Equipment

E-10	MTOE EOH	MTOE AVAIL
Aviation	92%	77%
CBRN	95%	92%
Cmd & Control	89%	84%
Engineering	97%	91%
Logistics	89%	86%
Maintenance	87%	82%
Medical	91%	86%
Security	97%	92%
Communications	91%	77%
Transportation	93%	87%

CDU FY 20 List

Equipment deliveries Aug 2020 - Dec 2021 are 77.7K pieces, including:

Category	Sum of Quantity
Air Defense	0
Aviation	0
Combat Service Support	0
Command and Control	4,076
CSSS	74
Fire Support	6
Intelligence and Electronic Warfare	1
Maneuver	4,864
Medical	312
Mobility	564
Nuclear Biological and Chemical	6,604
Soldier	61,246
Transportation	7

Basis of Projections - O/H Inventory: 27Jul20;
Requirements: FY21 MTOE requirements 27Jul20 USAFMA;
Distributions: Aug 20 – Dec 21
POC: COL John Moretti, 703-607-7891 ARNG-FD.

Modernized Equipment On-Hand vs Requirements

Category	Modern PCT	NOT Modern PCT	Total OH
Air Defense	91%	0%	91%
Aircraft	85%	0%	85%
Battle Command	91%	1%	92%
CBT Mobility	79%	0%	79%
CBT Vehicle & Strike	94%	0%	94%
Field Log	90%	0%	90%
Force Protection	97%	0%	97%
Medical Field Systems	83%	0%	83%
Other	83%	3%	86%
Soldier Systems/Weapons	82%	0%	82%
Trucks	88%	0%	88%
National Total OH	**87%**	**0%**	**87%**

Equipping Posture Updated Semiannually
Current Status - O/H Inventory: Jul20 does NOT include substitutes
Modern Equipment is Mod Level >= 3 in SECOP from AESS Jul 20 LINS Requirements: FY21 MTOE requirements 27Jul20 USAFMA;
POC: LTC James Belsha, 703-601-0591 ARNG-LGS

1

Figure B-2. Army National Guard Dashboard, July 2020

1. Army National Guard Equipment Shortfalls

Total Army modernization efforts continue to bring the ARNG in line with Active Army force structure capabilities. Equipment that is sustainable, interoperable, and deployable ensures readiness of the total force and supports the Director, Army National Guard's strategic vision. Likewise, the "right mix" of unit capabilities combined with modern equipment generates capability essential to conducting the ARNG's federal and domestic missions.

The ARNG serves as the nation's primary military responder for DOMOPS and homeland defense. Reducing CDU equipment shortfalls in capabilities such as Aviation, Command and Control, Engineering, and Communications ensures the ARNG's capability to respond to disasters and emergencies.

a. Aviation

The ARNG provides aviation forces to meet Army demands in theaters worldwide and concurrently provides a critical capability for domestic and Emergency Management first responders. ARNG rotary-wing and fixed-wing capabilities operate in combat areas, fight wildfires, provide search and rescue to support hurricane response, and are key to enabling the movements of first responders in the early aftermath of natural and manmade disasters. The

ARNG approach to investment in new procurement and the modernization of the aviation fleet allows ARNG leadership the flexibility to achieve long-term goals in support of U.S. Army combat needs while also meeting states' readiness requirements. The resulting fielding plans respect deployment requirements, individual state requirements, and past performance with respect to flying hour execution.

The ARNG requires 891 H-60 helicopters and continues to modernize its entire UH-60 aircraft fleet by divesting of all UH-60A aircraft by FY 2024, procuring the UH/HH through FY 2026, and recapitalizing the UH-60L into the UH-60V and UH-60V MED from FY 2018 through FY 2030. Modernization within the Guard will be accomplished by the recapitalization and digitization of the UH-60L fleet into the UH-60V series and the procurement of new build H-60M aircraft. Both of these initiatives will support the divestment of H-60As, as will cascading of H-60Ls to backfill H-60A equipped units. Upon completion of Army Aviation H-60 procurement objectives, the ARNG end state fleet will consist of 891 UH-60 aircraft: 193 UH-60L, 511 H-60M, and 187 UH-60V. The numbers include assault/command and control and medical evacuation variants.

The four ARNG Armed Reconnaissance Battalions (ARBs) will receive 24 AH-64E (most modern) to replace the current 18 AH-64 per ARB to match Compo 1 fielding levels. By FY 2026 the ARNG AH-64 fleet is projected to attain full modernization with 96 AH-64E aircraft. In FY 2022, FY 2023, FY 2025, and FY 2026, individual ARBs will receive 24 AH-64E aircraft. The ARNG Cargo Helicopter fleet is completely modernized with 165 of the Multiyear l CH-47F Block l aircraft. The ARNG Light Utility Helicopter fleet is at the authorized level of 212 UH-72As. The ARNG fixed-wing fleet is comprised of 57 aircraft (46 C-12 and 11 C-26) based in 52 locations. ARNG is in coordination with Headquarters Department of the Army and Project Management (PM) Office for both Light Utility Helicopter and Fixed Wing to mitigate impacts associated with modernization and required lifecycle modifications to sustain these fleets through the next decade and beyond.

The ARNG is currently short 185 Raven unmanned aerial vehicles (23 percent of the requirement). The Raven program for Compo 1, 2, and 3 was fielded to 85 percent of authorizations. The Medium Range Recon UAS replaces the Raven beginning in FY 2021/2022 and PM UAS will field ARNG units to full authorizations. The status of Army aviation is discussed in further detail in Appendix D.

b. Command and Control (C2)

The ARNG continues to improve C2 system modernization and readiness, but concerns about sufficient planning for future fielding coupled with slow rates of modernization still exist. Any reductions in C2 system funding for ARNG will reduce the ARNG's capability and capacity to conduct military domestic response C2 operations. Real-time information needed by commanders to maximize federal and state domestic response efforts requires an effective modernization effort.

The Joint Battle Command–Platform (JBC-P) provides Mission Command and situational awareness across all formations. The Army force structure growth (approved in the Army

Structure FY 2020–2024) and the Army Procurement Strategy Configure for Combat decision, increased the total Army requirement by 10 percent, leaving an equipment shortfall. The increase in requirement from 103,158 to 109,289 (aggregate four JBC-P line item numbers (LINs)) created an HQDA G-8 unfunded requirement of $254 million in Program Objective Memorandum 2022 that is projected to be funded during FY 2023–2025. If funding for this program declines, ARNG formations could be left without the most modernized (JBC-P software/hardware Mission Command On-the-Move capability. If the $254 million requirement remains fully funded, the units without mission command capability will receive and train on the most modern equipment by FY 2025.

c. Engineering

Engineering equipment provides a versatile and affordable emergency response capability in defense support to civil authorities (DSCA) missions. The majority of the Army engineer force structure resides in the ARNG and frequently deploys OCONUS for other missions. The engineering portfolio shows significant shortages in the Type I Hydraulic Excavator and the M1977A4 Transporter Common Bridge, which helps the Engineer Corps transport all bridging assets.

d. Intelligence and Electronic Warfare (IEW)

The IEW Portfolio consists of systems to support military intelligence and electronic warfare activities. IEW capabilities provide all-weather, near real time, ground-based tactical signals intelligence/electronic warfare systems capable of searching and monitoring the radio frequency spectrum, performing signal intercept, direction finding, and reporting operationally relevant information. Funding for IEW equipment has been decremented to support modernization priorities. Current hardware and software deficiencies degrade or eliminate the ARNG Military Intelligence Warfighting Function ability to operate digitally and collect and disseminate intelligence, and create interoperability challenges with modernized formations. The early sunset of legacy intelligence systems will create a significant loss to ARNG readiness.

2. Effects of ARNG Shortfalls

Modernizing ARNG domestic response capabilities remains chief among ARNG leadership priorities. Yet significant risk to domestic capabilities exists when any planned modernization does not occur. The current fiscal environment requires the ARNG to cross-level equipment for deployments within and between the 54 states, territories, and District of Columbia, degrading unit readiness. Although concurrent and proportional modernization across the Army Components is ideal for all systems, the Army can only modernize the ARNG as fast as fiscal resources allow.

Any shortfalls in command, control, and communications (C3) reduce the ARNG's ability to provide a tactical network, facilitate C2, and ensure communication among first responders, the Emergency Operations Centers (EOCs), and Soldiers in the field. As of August 4, 2020, the 22,538 ARNG soldiers deployed provided critical infrastructure protection, support to civil authorities, and disaster relief, including 241 soldiers on Civil Disturbance Operations, 20,188 personnel on COVID-19 relief, and 109 Soldiers working Hurricane Isaias relief. The range and

complexity of these missions reflects the importance of C3 capabilities and mandates continued modernization of C3 systems.

Although the ARNG is currently 93 percent EOH for CDU equipment (including authorized substitutes), significant shortages exist in critical capabilities such as: the Nuclear Biological Reconnaissance Vehicle; Load Handling System Compatible Water Tank Rack; Modular Fuel System–Tank Rack Module; Cargo Truck (5T); and the Semitrailer: Flatbed 34 Ton. The estimated cost to fill the shortfalls is $2.99 billion. Without procurement or modernization of these capabilities, the ARNG must respond to domestic emergencies with reduced capability, potentially requiring additional resourcing such as contracted civilian equipment.

3. Army National Guard Investment Strategies

The combined efforts of new procurement funding, National Guard and Reserve Equipment Account (NGREA), and cascaded equipment ensures ARNG is interoperable, sustainable, and deployable with the Active Component. The ARNG continues to support a balanced modernization strategy that provides capacity and capability to Large Scale Combat Operations and safeguards its robust response capability for DOMOPS. The ARNG priorities include 1) Modernize ARNG Mission Command Systems to increase interoperability with the Active Component, 2) Reinvest in Engineer and Mobility equipment to remain deployable to support Combatant Commanders and Governors, 3) Modernize CDU equipment to support DOMOPS, and 4) Invest in ARNG IEW shortages. The ARNG continues to use authorized substitution and less modern (although still capable) equipment to meet mission requirements to support DOMOPS and combatant commanders. However, maintaining this aging equipment has required significant increases in sustainment funding.

The National Guard leverages NGREA to modernize key CDU equipment, critical Essential 10 equipment capabilities, and training simulation to mitigate the risk to CDU equipment and domestic response readiness. The ARNG did not receive NGREA for FY 2020. Although the ARNG submits recommendations for the CDU equipment list to the Army for vetting and approval biannually, without resources applied against these CDU capabilities, the ARNG will continue to assume risk in modernization

C. Air National Guard Equipment

The Director, Air National Guard's (ANG's) three lines of effort remain the same: Readiness for Today's Fight; 21st Century Guard Airman; and Build for Tomorrow's Fight. The ANG's modernization efforts center on the first and last of these three tenets, continuously improving readiness and improving capability to support future combat and DOMOPS. In keeping with the Director's priority to Build for Tomorrow's Fight, the ANG offers effective capabilities to the Total Force by modernizing existing equipment. The ANG leverages its unique strengths, such as its experienced workforce, strategic locations, and synergistic partnerships, to provide a future force design that capitalizes on the inherent advantages of ANG airmen, the 90 wings, and the 54

states and territories.[5] The NGREA is a valuable funding tool as the ANG modernizes the force guided by CNGB, ANG Director, and AF priorities (see Table B-1).

The ANG is operationally engaged across every AF mission set, including newly added U.S. Space Force missions, and is simultaneously an integral part of how the NG responds to the needs of its communities. Over the past decade, the ANG has proven its value as the primary Air Force Operational Reserve force. Today's ANG includes some of the most talented individuals the nation has to offer. The accessibility, diversity, leadership, community ties, culture, and civilian skills of ANG Airmen define the foundation of the force.[6]

In the coming years, the ANG faces equipment and infrastructure modernization issues that will force it to change how it looks and operates. As the AF seeks to replace legacy equipment, it can expect budgetary pressures of costly new systems to result in higher levels of risk in the modernization of existing equipment. The future AF relies heavily on technological advantages in space, C2, intelligence and reconnaissance systems, cyber, remotely piloted aircraft, and next generation fighters, tankers, and bombers.[7] The standup of the U.S. Space Force by the 2019 National Defense Authorization Act (NDAA) drives additional changes. The ANG pledged its support to the newest Service by rapidly growing from 40 percent of the Space Force operational expeditionary space electronic warfare capabilities to 60 percent with the addition of two squadrons in Guam and Hawaii.[8] The ANG anticipates initial equipment and personnel requirements designated to support the former Air Force Space Command will transfer to Space Force installations.

CNGB stated, "Looking to the future, the ANG must modernize and recapitalize its equipment concurrently and in a balanced manner commensurate with the active duty ensuring deployability, sustainability, and interoperability across all mission sets. The ANG remains focused on resourcing and training lethal, resilient Guard Airmen, and developing exceptional leaders."[9] The revised table shows equipment and vehicle data extracted from the Defense Property Accounting System (DPAS), the new Accountable Property System of Record (APSR) for equipment, and the Defense Medical Logistics Standard Support information technology system. As the ANG navigates through the capabilities of the APSR, coupled with more in-depth inventories, the ANG continues to establish more defendable, repeatable, and auditable equipment data (See Table B-1).

[5] Air National Guard Readiness Center 2019 Strategic Plan.
[6] Ibid.
[7] Ibid.
[8] Written Statement by General Joseph L. Lengyel, Senate Appropriations Committee, Subcommittee on Defense, 4 March 2020, p. 5.
[9] Written Statement by General Joseph L. Lengyel, Senate Appropriations Committee, Subcommittee on Defense, 10 April 2019, p. 3.

Table B-1. ANG Equipment and Vehicles

Essential Capability	Total Asset On-hand Quantity	Total Asset On-hand Cost ($)	Total Asset Requisition Quantity	Requisition Total Cost ($)	Remaining Unfunded Requirement	Remaining Unfunded Requirement ($)
Aviation Support Equipment	52,835	800,483,043	505	34,020,588	521	29,620,151
Civil Support & Force Protection	2,756	40,413,656	15	993,121	78	629,454
Command & Control	12,302	570,372,626	1,268	29,169,668	1,177	27,846,742
Communication	25,658	270,004,938	572	10,827,761	560	10,622,309
Engineering	11,446	158,821,641	268	11,704,020	237	11,045,068
Logistics	19,736	228,895,452	314	9,894,638	249	9,318,371
Maintenance	71,913	1,548,169,825	6,831	279,918,727	5,302	246,501,415
Medical	17,556	85,031,909	0	$0	0	0
Security	121,940	134,922,425	19,086	10,403,357	19,065	10,167,191
Total	336,142	3,837,115,515	28,859	386,931,879	27,189	345,750,701
	In Use Quantity	**In Use Cost ($)**			**Needed Quantity**	**Needed Cost ($)**
Vehicles	14,069	1,881,258,387			1,240	106,929,924
Total Equipment & Vehicles	350,211	5,718,373,902			28,429	452,680,624

1. ANG Equipment Shortfalls

A detailed review of the ANG equipment on hand is presented in Table B-1.

a. CBRN

The NG Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (CBRNE) Enhanced Response Force Packages (CERFP) and Homeland Response Forces (HRF) medical elements need to upgrade their advanced trauma medical equipment. Medical requirements identified for modernization and renewal include the medical rapid response shelters, generators, oxygen generators, medical ultrasound, thermometers/vital signs monitors, environmental control units (ECUs), and exterior lighting in addition to a standardized equipment mounting solution to safely secure medical equipment during patient use. The medical rapid response shelters with ECUs, generator modernization, and oxygen generators have been validated through the Domestic Capability Priority, and are awaiting final funding approval. NGREA and program funding is planned for their procurement.

Additionally, patient tracking remains a capability gap for NG medical CBRN Response Enterprise (CRE) forces. An automated tracking system that enables the tracking of victims and treatment between ANG medical units and local and regional hospitals was identified as a

shortfall by the CNGB to the Chairman of Joint Chiefs of Staff in the annual (FY 2018–2022) Chairman's Capability Gap Assessment.

b. Command and Control (C2)

ANG C2 organizations require systems upgrades in Air Operations Centers (AOC), Battle Control Centers (BCC), Air Control Squadrons (ACS), and Control and Reporting Centers (CRC) to meet combatant command requirements. C2 organizations operate with outdated software, radar, communication, and data-link equipment as well as software that is not on par with current technology, creating several operational limiting factors. AOCs need a core radio package system comprising multiple radios, antennas, and datalink systems, plus a cross-domain solution (CDS) to allow simultaneous views of multiple classified and unclassified security domains. BCCs need advanced data link capabilities to pass critical tasking messages, simulator training systems, and a CDS to share tactical data. CRCs need advanced identification equipment, remote radar and communications equipment, as well as a highly mobile active electronically-scanned array radar. Critical shortfalls exist with the TPS-75 Radar, Mode 5, combat ID, and counter unmanned aerial systems/counter cruise missile capabilities. Funding must be planned for procuring critical upgrades to AOC, BCC, and ACS systems to match technology and capabilities fielded by the active duty component. The FY 2021 NGREA funding plan procures critical upgrades to AOC, BCC, ACS, and CRC systems.

c. Communications

ANG communications forces have required equipment for assigned Title 10 missions, but gaps exist for DOMOPS. Military emergency response forces are often unable to conduct interoperable communications with their civilian emergency response forces when utilizing military-issued tactical radios. Radios must interoperate with civil networks in both line-of-sight and trunked modes. They should provide over-the-air geolocation data and offer National Security Agency Type 1 certification and programmable encryption. These radios facilitate communication on common military and civilian very-high and ultra-high frequency AM/FM civil bands, and grant automatic, instant connectivity among personnel entering the operational area. The encryption provides state-of-the-art security when required. Without these highly capable and interoperable radios, responders risk mission degradation or failure during domestic disaster response operations.

d. Engineering

In limited cases, the ANG is authorized to use NGREA funding to upgrade equipment and vehicles that would otherwise be centrally managed by the AF. The ANG relies on outdated equipment and vehicles, which impact all logistics functional areas and other areas providing Base Operational Support. Centralized procurement of vehicles at the AF level impedes the ANG from modernizing its vehicle fleet at a rate that would have noticeable impact on vehicle readiness reporting. Other centralized management of supply chain functions at the AF level impact the ANG's ability to support federal and DOMOPS requirements. Additionally, 2.03 percent of ANG equipment remains deployed in support of overseas contingencies. These assets must be replaced or modernized to provide the states a domestic response capability when

the items return from overseas support to federal missions. FY 2021 funding is programmed for upgrading Security Forces personal protective equipment, Mobile EOC, and Space Control vehicles and equipment.

e. Medical

Critical Care Air Transport Team, En-Route Patient Staging System, and Aero-medical evacuation equipment is out of date and needs modernization to support contingency operations and DOMOPS. ANG domestic responses routinely include prolonged patient care by Guardian Angel (GA) personnel on HC-130s, HH-60s, and numerous other platforms. Relevant, modern, technologically advanced medical equipment is necessary to sustain this life-saving capability and to assure accurate tracking of patient movement. FY 2021 funding is planned for the procurement of oxygen generation, airway management, GA, patient tracking, and other medical support equipment, such as Tactical Combat Casualty Care medical kits.

f. Security

ANG Security Forces (SF) includes 7,500 defenders from wings in all 54 states and territories. SF faces an extremely high operations tempo with air expeditionary force deployments and missions in support of civil authorities. The ANG's shortage of available ranges to conduct small arms qualification training degrades wings' operational readiness for personnel preparing for deployment. The ANG has previously filled SF equipment shortfalls utilizing NGREA funds. Within the last year, the ANG has begun to field portable modular ranges to increase deployment and full spectrum readiness as well as duty gear modernization systems and DOMOPS response trailers. ANG also modernized a portion of the SF vehicle fleet to equip Security Forces Defenders to meet their Title 10 and domestic response missions. SF personnel identified additional equipment requirements that include non-lethal weapon modernization, utility task vehicles, counter small unmanned aerial systems, ballistic body armor system, advanced individual trauma kits, multitrace (chemical, explosive, and narcotic) detection systems, advanced night vision systems, the joint integrated base defense command situational awareness system, Security Forces Resources vehicles, and a Security Forces Climate Clothing System that will enable SF Squadrons to provide mission-ready Airmen for federal and domestic missions.

g. Transportation

The ANG vehicle overall EOH is at 76.3 percent, but fill rates do not address significant issues associated with the ANG Vehicle Fleet health rate. Approximately 26 percent of the ANG vehicles in use exceed their life expectancy. Additionally, 10 percent of validated vehicle requirements are unfilled. Traditionally, NGREA spending cannot be utilized to sustain vehicle procurement programs. The ANG remains woefully underfunded in the centralized AF Vehicle Procurement program and established long-term programmatic requirements across the fiscal year defense plan will be required to bring ANG vehicle health rates to acceptable levels. The ANG has previously used NGREA spending to support modernization efforts for Battlefield Airmen missions, as reflected in the total number of vehicles in use. Nonetheless, the number of vehicles in use that are at or past life expectancy continues to degrade its vehicle health rates. At this time, the ANG still fails to meet Air Force Common Output Level Standards (80 percent

Fleet health rates) toward ANG Health of the Fleet. ANG fleet procurement and modernization is critical to replace existing vehicles that have passed their lifecycle usefulness to accomplish federal and state missions (see Table B-2). Previous funding cuts in transportation have created an ever-increasing deficit in required funding to replace the equipment on time, as shown in Table B-2 under "Program Funding Deficit."

Table B-2. ANG Vehicle Fleet Health Rates: August 2019

Category	Health Rate (%)	Effective Age	Program Funding Deficit ($)	Fill Rate (%)	Vehicle Age
Passenger Carrying	88.9	14.4	7,287,494	92.0	14.0
Medium Tactical	53.6	17.4	63,234,104	74.6	16.6
Cargo & Utility	78.8	14.3	71,086,308	89.3	13.7
Joint Light–Tactical	79.7	13.4	23,442,060	80.8	11.8
Security Tactical	32.8	17.7	14,899,353	62.9	16.3
Special Purpose	81.3	15.9	74,891,158	90.4	15.5
Fire Fighting	79.8	12.4	60,342,141	88.0	11.4
Material Handling	78.9	15.7	39,534,002	89.0	15.2
Snow Removal	82.7	14.5	30,052,002	94.2	14.2
Base Maintenance	82.7	12.2	40,950,333	84.4	10.8
Summary	**76.3**	**14.8**	**425,718,955**	**86.7**	**13.9**

2. Effects of ANG Shortfalls

The ANG uses equipment and vehicles to support federal and DOMOPS. Shortfalls in equipment and vehicles, or failures to modernize those items with standardized active component equipment and vehicles, significantly undermines the ANG's ability to support federal and state requirements. These items include equipment that supports warfighters through the combatant commands and equipment that supports lifesaving DOMOPS operations during a man-made or natural disaster. Some enhancements to current capabilities that will improve the overall effectiveness of existing efforts include Security Force equipment and vehicles, CERFP/HRF equipment and vehicles, and C2 existing equipment shortfalls. See Chapter 5, Section II, for additional information on ANG equipment and modernization. ANG Priorities Books are at https://www.ang.af.mil/Home/ANG-Priorities-Books/.

3. ANG Requirements and Acquisition Strategies

The ANG focuses on mitigating capability gaps critical to its combat and domestic missions. The process starts through two venues, the first being the Air Reserve Component Weapons and Tactics Conference, which brings together experts from each of the ANG's weapon systems to identify combat mission capability gaps. The second is the Domestic Capability Priorities (DCP) Conference, which brings together first responders and experts in the homeland missions to identify domestic mission capability gaps. These capabilities and associated programs are documented in the annual ANG Weapons Systems Modernization Priorities and DCP books. The capability gaps go through a comprehensive verification and validation process to determine if

they are actual requirements that meet identified combatant command or domestic mission shortfalls, are sustainable and trainable, meet authorization levels, have facilities to store them, have a viable acquisition strategy, are supported by affected ANG directorates, can be integrated into current ANG equipment when applicable, and have a commercial off-the-shelf or government off-the-shelf solution. The ANG then uses numerous contract vehicles to procure material solutions for the identified requirements, many of which are dual use for combat and domestic missions, and fields the solutions to applicable units.

D. Specialized CBRN Equipment

The National and Defense Security Strategies recognize that the U.S. is no longer a sanctuary; and correspondingly, the threat of CBRN incidents in the Homeland continue to increase. Pharmaceutical based agents (PBAs) such as fentanyl and related derivatives are prevalent in the U.S. because of illicit drug trafficking and can be used as incapacitating agents or contaminants. State and non-state actors have demonstrated willingness to use chemical agents from combat zones in Iraq and Syria to Great Britain, and the spread of nuclear weapons to rogue actors is a near certainty. Therefore, the domestic threat is real and the probability of major or catastrophic domestic CBRN incidents is increasing.

Specialized CBRN equipment supports NG CBRN Response Forces used during CBRN incidents that include use or threatened use of Weapons of Mass Destruction (WMD); terrorist attack or threatened terrorist attack; intentional or unintentional release of nuclear, biological, radiological, or toxic/poisonous chemicals; and natural or manmade disasters in the U.S. that results, or could result, in the catastrophic loss of life or property. This equipment serves to identify hazards, assess current and projected consequences, advise on response measures, and provide additional support.

The NG CRE elements (for state/Title 32 response) consist of the WMD Civil Support Teams (CSTs), HRFs, and CERFPs. HRFs and CERFPs are modular joint task forces tailored to provide life-saving capabilities during multiple or large-scale domestic CBRN incidents involving mass casualties from CBRN and high-yield explosive hazards. These joint task forces are geographically distributed to enable rapid response times for the majority of the U.S. population.

1. Specialized CBRN Equipment Shortfalls

a. Non-traditional Agent (NTA) Detection

WMD-CSTs have insufficient capability to detect and identify NTAs at low concentration levels and when mixed with interferents; specifically, fourth generation agents such as Novichok, and PBAs such as fentanyl and carfentanil. These agents are extremely lethal even at very low concentration levels and often are mixed (in a domestic incident) with other substances

b. PBAs, Medical Countermeasures (MCM), and Decontamination

WMD-CSTs currently lack an effective down-range MCM, or decontamination capabilities for fentanyl and other PBAs. Current commercial off-the-shelf (COTS) MCM (Naloxone injectors) do not provide sufficient dosages to meet therapeutic levels to ensure survival. Additionally,

there exists no known effective decontaminate. Soap and hot water decontaminate personnel, but most fentanyl derivatives remain a hazard in the run-off.

c. Radiological and Nuclear Detection and Identification

WMD-CSTs have insufficient capability to detect and identify radiological and nuclear (R/N) hazards (including special nuclear material) to prevent or respond to domestic R/N incidents.

d. Mounted R/N Detection

WMD-CSTs lack a mounted R/N detection capability and therefore cannot conduct large area R/N broad area search missions in support of domestic Radiological and Nuclear Search Operations, Prevention of Radiobiological or Nuclear Disasters, National Special Security Events, or post incident survey missions for major catastrophic incidents.

e. Dismounted R/N Detection and Identification

WMD-CSTs require dismounted R/N capability to detect and identify R/N threats to include Special Nuclear Materials. The Army agreed to field 42 of 57 Manportable Radiological Detection Systems to the WMD-CSTs; but sufficient funding and the fielding plan remain undetermined. CBDP, also eliminated funding for the WMD-CST Radiological Isotope Identification Detector.

f. Biological Agent Detection

WMD-CSTs lack sufficient capability to detect biological warfare agents or emerging infectious diseases. Joint Biological Detection System (JBTDS) is the primary program of record (POR) for biological threat detection. CBDP eliminated funding for fielding the JBTDS to WMD-CSTs.

g. Search and Rescue Reconnaissance

No capability exists for CERFP and HRF units to rapidly conduct tactical reconnaissance to locate victims in the hazard area and direct technical rescue search and extraction operations. In advance of lifesaving rescue operations, HRF and CERFP commanders require rapid verification of the level of environmental contamination and the location of surviving victims that require rescue in the hazard area.

h. Enabling Technologies and Capabilities.

NG CRE Information Management System. The NG CRE Forces lack sufficient capability to provide an integrated CBRN Common Operating Picture at the tactical-level and cannot share tactical information with mission partners and systems at the operational and strategic levels. The NGB initiated fielding the NG CRE Information Management System to mitigate this capability gap. The long-term viability of the NG CRE Information Management System (NG CIMS) depends on integrating NG CIMS capability requirements and sustainment within multiple existing DoD PORs.

Disaster Incident Response Emergency Communications Terminal (DIRECT) and Joint Incident Site Communications Capability (JISCC). After Hurricane Katrina, the NG was directed to implement a communications capability in every state and territory for the purpose of enabling

C2. JISCC was conceived and deployed, then evolved to become the DIRECT system. Portions of the system are Programs of Record. However, DIRECT is being fielded at a regional level and not at a state/territory level. This fielding plan and the DIRECT manning requirements leave a gap of 14 systems that will be met with the JISCC Block 4 fielding.

2. Effects of Shortfalls of Specialized Equipment

a. Insufficient Capability to Detect and Identify NTAs at Low Concentration Levels and When Mixed with Interferents

State and non-state actors are actively researching novel forms of chemicals. Non-state actors have developed and used crude chemical weapons while continuing to refine their recipes, means of delivery, and tactics. The threats are increasing and the impact of domestic use is high. Therefore, NTA detection gaps incur significant to high operational risk.

b. PBA, MCM, and Decontamination

Death can occur within three minutes from exposure to fentanyl or carfentanil. The inability to provide an immediate MCM for PBA exposure incurs unacceptable health risks for WMD-CST personnel. The inability to effectively decontaminate WMD-CST personnel without exposing the public to potentially toxic run-off brings unacceptable risk to public safety.

c. R/N Detection and Identification

The divestiture of the Chemical Biological Defense Program (CBDP) eliminated R/N capability development and procurement. Thus, NGB lacks the means to develop, procure, or modernize WMD-CST R/N detection and identification equipment. Eliminating the means for WMD-CSTs to obtain necessary R/N detection and identification equipment incurs unacceptable risk to mission for the WMD-CSTs.

d. Search and Rescue Reconnaissance

CERFP and HRF Search and Extraction Elements must conduct reconnaissance using personnel intensive point and area reconnaissance techniques, delaying the rescue of survivors and increasing the loss of life.

e. Enabling Technologies and Capabilities

NG CIMS. Without fielding and sustainment of NG CIMS, the CRE lacks an integrated CBRN Common Operating Picture at the tactical-level and cannot share tactical information with mission partners and systems at the operational and strategic levels.

DIRECT and JISCC. DIRECT requires a long-term solution to modernize the system into a program of record compatible with Army baseline for DSCA and domestic response communications with first responders, interagency partners, and supporting DoD elements.

3. Requirements and Acquisition Strategies for Specialized CBRNE

a. Challenges

Several recent developments seriously hindered efforts to develop and resource required equipment and capability to the CBRN Response Enterprise. The 2019 Defense Wide Review

(DWR) decision to divest the CBDP of R/N capability development and procurement leaves NGB without a means to develop, procure, or modernize WMD-CST R/N detection and identification equipment. Additionally, DWR decisions reduced CBDP funding available for developing and procuring WMD-CST biological detection equipment and for science and technology investments to develop chemical detection equipment capable of detecting NTAs at low levels of concentration and when obscured by impurities. Finally, the reprogramming of 2020 NGREA funds delayed progress in modernizing CRE equipment and capabilities.

b. Mitigation

The strategy to mitigate these two developments includes leveraging future procurement dollars to support the required detection, identification, and mitigation of agents; improve search and rescue and communications capability; and seek other DoD offices (such as Joint Program Executive Office (JPEO)-CBRN or the Defense Threat Reduction Agency) that can support development, procurement, and program management capabilities lost by the divestiture of the CBDP. Using an alternate program office may preclude establishing programs of record and modernizing the materiel solution once developed and fielded.

Further, NGB continues to pursue POR for equipment to accomplish the full CRE mission by documenting the requirement, validating the resources, and supporting research and development and procurement of the solution. NGB is currently developing necessary documentation to obtain POR status for NTA Detection and CIMS requirements.

DIRECT and JISCC. NGB will develop and deliver 14 JISCC Block 4 systems coupled with DIRECT to fill the requirement laid out in JROCM 173-06. JISCC Block 4 is being designed as a lightweight, rapidly deployable, flexible system that fully meets DOMOPS mission requirements, all without requiring MOSQ individuals for operation.

Search and Rescue Reconnaissance. In recent years, NGB coordinated with the JPEO-CBRN and funded the COTS modernization process to experiment with using Unmanned Aerial Vehicles to perform rapid search and rescue reconnaissance.

II. Statement of Accuracy and Certification Relating to National Guard Equipment

Section 10541(d) of Title 10, U.S.C. requires this report to provide (1) a statement of the accuracy of the NG equipment inventory projection reported in previous NGRERs, and (2) a certification by the CNGB of the inventory of equipment items that were due procurement for the NG in the preceding fiscal year, but were not received. Figure B-1 provides a CNGB memorandum regarding "Certification and Statement of Accuracy to Accompany the Annual National Guard and Reserve Component Report."

A. Army National Guard

The transparency process, in accordance with the FY 2008 NDAA, provides the auditable path of approved funding and new procurement quantities enacted to track appropriated funds and requirements through the acquisition cycle to equipment delivery. Army Regulation 700-142 codifies roles and responsibilities for Transparency Stakeholders, with the Assistant Secretary of

the Army for Acquisition, Logistics and Technology identified as the overall Army policy lead for Army Transparency.

The current Army capability to systematically trace fielded equipment back to the procurement appropriation year lacks the fidelity required for the ARNG to certify the Equipment Transparency Report. Improvements have been made to the accounting process, using Item Unique Identification (IUID) over the past year through a collaborative, automated collection tool in Army Equipping Enterprise System, which, for the first time, has allowed the ARNG to certify a portion of the deliveries completed from FY 2013 appropriations forward. The Army will continue to improve data collection methods through web-based capability improvements, and intends to achieve full transparency using IUID as part of Global Combat Support System–Army (GCSS-Army). The Army modified the auditability process to use investment dollar and quantity databases as the reference to audit the transactions because of continuing P-1 and P-1R Form inconsistencies and LIN quantity suppression below the Acquisition Category I level.

The Army continues to oversee proposed changes and improved data collection to streamline the transparency process, and has institutionalized the requirements for IUID in conjunction with the fielding of GCSS-Army (completed in 2018), to provide the systematic database links required to meet transparency requirements. The ARNG procured 3,714 Handheld 3Terminal Tablets and Scanners to bring scanning equipment to 97 percent on hand (when issued) to improve the automated inventory of equipment, enhancing true accountability and transparency through GCSS-Army. The ARNG will continue to work with the Army as the Executive Reporting Agent to Congress on Transparency to provide certification of equipment delivery and transparency.

B. Air National Guard

The ANG has nearly completed the migration from the Air Force Equipment Management System to the Defense Automated Property System (DPAS) for equipment. (ANG vehicles are totally managed using DPAS.) The ANG is assured that the data provided by DPAS will enable more effective and efficient resource decision-making. The ANG uses DPAS as the Financial Improvement and Audit Readiness–compliant system of record for equipment and vehicles and is standardizing the order, update, transfer, and disposal of assets using the new system.

As the ANG migrates to DPAS, it is encouraged by the addition of the capability to define equipment authorizations versus on-hand balances. This capability brings added reliability to the data obtained from the single information system and enables base-level users and command managers to validate programmatic requirements. Eventually, DPAS will enable the ANG's 90 wings to adjust to and gain understanding of what the system offers in long-term planning and provide immediate accountability in a standardized manner.

The ANG continues to make strides toward auditability and accountability of equipment and vehicles as a priority for its units. However, challenges frustrate some ANG efforts to adapt to the new system. Implementing such a complex data migration plan while processing supply demand to support ongoing operations resulted in times when data was unavailable because of migration errors or when ANG materiel managers could not depend on the data to make data-driven resource decisions. Other challenges include ANG-unique requirements, lingering

requisitions, order prioritization, and warehousing functionality limitations. ANG materiel management subject matter experts are working closely with their AF counterparts to identify challenges and communicate lessons learned to the system development team to overcome these obstacles.

The ANG remains committed to ensuring its processes result in defendable, repeatable, and auditable logistics readiness functions. The ANG is certain that as DPAS matures and the ANG learns more about its capabilities, this system will make producing a timely, accurate, and complete view of the state of equipment and vehicles in the ANG possible. The ANG believes DPAS will be a system of record that will enhance the information provided in future NG and Reserve Equipment Reports.

Appendix C
Principles of Modernization

Reporting Requirements

The Appropriations Subcommittee on Defense reinforced their continued support for maintaining fully modernized reserve components in the Committee on Appropriations, Senate Report 114-263, accompanying the Department of Defense Appropriations Bill, 2017. In their report, they noted that the codification of modernization principles would better allow for transparent appropriation decisions and thus directed the Secretary of Defense to promulgate service standards for reporting modern equipment. The Department responded to this requirement in the FY 2018 NGRER. The Department asked each of the Services to provide their definition of modern equipment and outline principles in order to develop an overarching definition that could be used department-wide. Based on the variation of this input, the Department determined that the term "modern equipment" was too vague and did not lend itself to a single definition. Instead, the Department presented a "modernization model" which proposed modernization criteria and defined standards by which the deployment of Forces could be best planned.

Objectives

In the FY 2020 NGRER, this appendix was used to provide examples of how dedicated investment, or lack thereof, affects the RCs ability to achieve Total Force compatibility standards. The example presented was the Navy Reserve (USNR) P-8A Poseidon capability. This year, the USNR provides an illustration of the requirement for investment into recapitalization of the C/KC-130T fleet with the newest variant, the KC-130J. First, a review of the modernization model is presented, including a discussion of how to best weigh risk in investment decisions with respect to obsolete equipment.

Modernization Model

The modernization model helps categorize equipment within a spectrum of "modernization" using a capability-based equipment planning diagram (Figure C-1). Within this appropriations planning tool, equipment is divided into three specific categories—cutting edge equipment, globally deployable equipment, and not globally deployable equipment—with distinct criteria for each. Use of the model focuses attention on the level of risk being assumed and assists with investment decisions (upgrade, replace, new procurement, or divest).[1]

The model shows how centrifugal forces such as age, pace of technological advances, and overall capability push equipment "outward" toward obsolescence, while investment in new

[1] Upgrade means to integrate new technology into existing equipment. Replace means to exchange existing equipment with newer equipment through redistribution or cascading. New Procurement means to supplant existing equipment with newly purchased equipment. Divest means to dispose of outdated equipment no longer needed in the inventory.

procurement and upgrades serve as the force propelling equipment "inward" toward cutting edge capability.

Cutting Edge Equipment is a platform or piece of equipment that completely incorporates the latest technology and innovation. There are no components or sub-components which have upgrades or replacements identified and ready to be fielded. This equipment is within 10 years of its initial operating capability, a gauge of time at which consideration should be given to assessing the equipment and technologies that exist to upgrade, replace, or identify it as no longer "Cutting Edge."

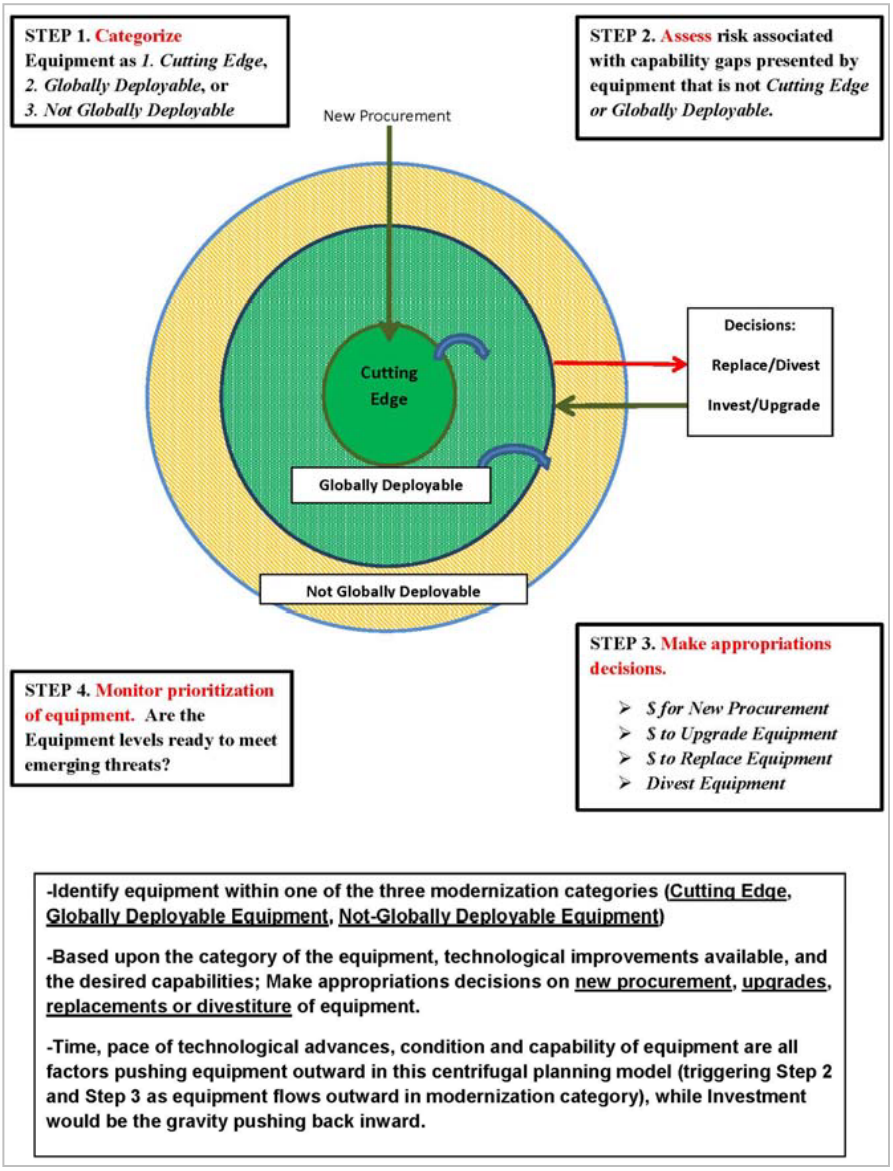


Figure C-1 Codification of Modernization

Globally Deployable Equipment includes Cutting Edge Equipment and equipment which meets the minimum standards for deployment and mission capability into all planned operating environments for that specific equipment, including all combatant command areas of responsibility and non-permissive and contested environments. This equipment must be: 1) technically compatible across associated joint and combined forces organizations, and 2) logistically supportable–sufficiently sustainable in any deployment environment with existing maintenance support and supply chain.

Not Globally Deployable Equipment is all equipment that does not meet the criteria to be categorized as Globally Deployable or Cutting Edge Equipment. This equipment may be capable to meet mission requirements in certain operational requirements or deploy to certain combatant

command areas of responsibility, but is not appropriate for use in a planned operating environment.

Example: Navy Reserve – KC-130J Hercules Capability

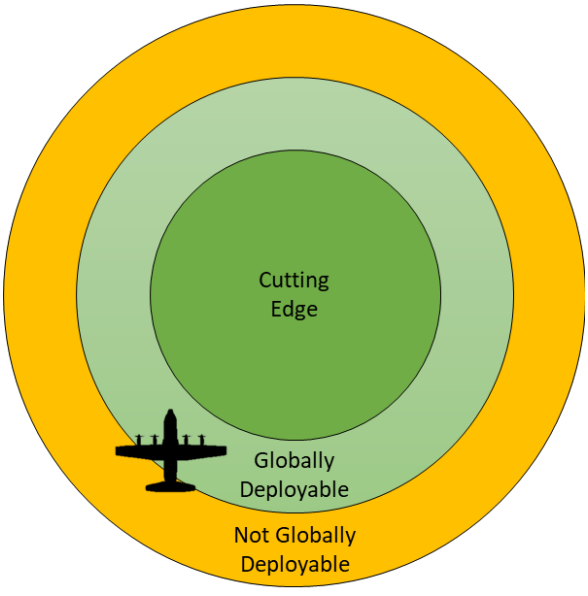
Capability Description: The C-130 is a medium lift aircraft used for cargo and personnel transport, with the ability to operate from unprepared airfields. It serves as the Navy's critical intra-theater combat logistics connector in resupplying, rearming, and refueling maritime forces forward and is the Navy's only transport aircraft capable of moving oversized cargo (all modules of the F-35 engine, AMRAAM and Harpoon missiles, submarine masts, etc.). In addition to the USNR, all components of the Air Force and the Marine Corps operate variants of the C-130 aircraft.

Background Information: The Navy's entire fleet of 24 C/KC-130Ts resides in the USNR. USNR C/KC-130Ts operate out of squadrons based in Pt. Mugu, CA, New Orleans, LA, Jacksonville, FL, Washington, D.C., and Burlington County, New Jersey. These squadrons support persistent detachment sites globally, providing short-notice cargo and personnel transport in support of Navy Unique Fleet Essential Airlift (NUFEA). While TRANSCOM is responsible for inter-theater logistics movements, the Navy NUFEA fleet is responsible for intra-theater lift, the last logistical mile to support geographically distributed Navy assets. In FY19, Navy provided $12M in advanced procurement funding to enter the multi-year production contract with the commitment to purchase three KC-130J. However, Navy was unable to provide funding in FY20 to continue to support recapitalization.

Programming & Funding Profile: Recapitalization of C/KC-130T is not funded in the Future Years Defense Plan (FYDP). However, sustainment funding has been programmed as a bridge solution until recapitalization of the legacy USNR C/KC-130T fleet is possible.

Application of the Modernization Model: This section illustrates how the modernization model can be applied to inform procurement appropriation decisions.

Step #1: Categorize equipment. Equipment age, pace of technological advances, condition and capability of equipment are driving factors necessitating modernization investments. The following criteria are applied to determine the categorization of equipment. This is the initial step in making an appropriation decision.



- *Cutting Edge Technology*: **No.**
- *Latest Technology?* **No.** Navy C-130Ts entered service in 1993. The five KC-130Ts received following USMCR recapitalization in 2014 entered service prior to 1990.
- *Upgrades or Replacements Identified?* **Yes.** The Navy C/KC-130T Avionics

Obsolescence Upgrade (AOU) program (similar to the USAF Avionics Modernization Program (AMP)) will provide the fleet with a new avionics suite, enhanced communication capabilities, and electrical improvements, which are expected to correct major readiness degraders. The first aircraft to receive AOU were grounded for nearly two years, as a result of the red stripe issued following the July 2017 USMCR C-130T crash in Mississippi. The inability to proceed to flight test delayed the program, creating funding uncertainty. However, the Navy's 24 aircraft are back in service and the AOU program is fully funded across the FY 2021 FYDP. The fleet still requires engine upgrades, which have funding identified in the Navy budget but are still years away from completion. Navy C/KC-130Ts lack over-the-horizon communication capability that will not be provided with AOU. KC-130J offers all previously mentioned capabilities.

- *Within 10 Years of Initial Operating Capability (IOC)?* **No**. The USNR's 19 C-130Ts are an average of 25 years old; the five KC-130Ts average 30 years old.
- *Globally Deployable?* **Yes.** The C-130Ts are globally deployable.
- *Technically Compatible?* **Yes.** Today, C/KC-130T systems are a generation behind current fleet architecture. At the completion of Avionics Obsolescence Upgrade (AOU), there should be avionics parity.
- *Logistically Supportable?* **Yes.** USNR C/KC-130Ts are logistically supportable within the existing maintenance support and supply chain. As with many aging fleets, parts obsolescence and diminishing manufacturing sources impact logistics support. This will be amplified as more of DoD and USCG transition out of legacy into KC-130J.

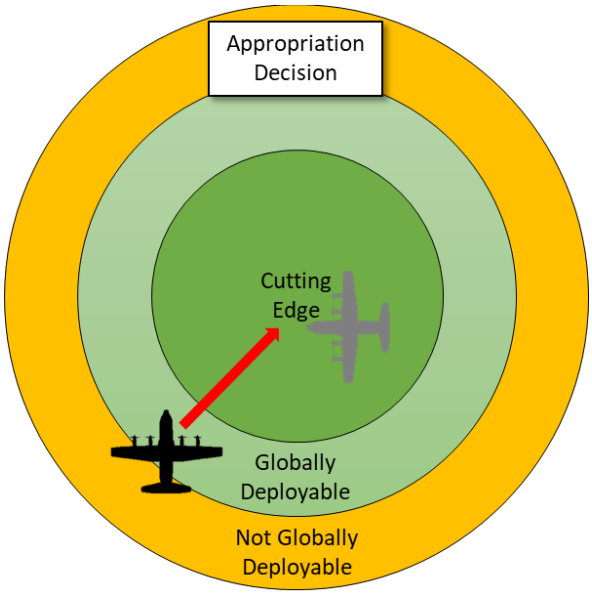
Step #2: Assess risk associated with capability gaps presented by equipment that is not Cutting Edge or Globally Deployable.

Risk: The C-130J incorporates state-of-the-art technology which reduces manpower requirements, lowers operating and support costs, improves readiness and survivability and provides life-cycle cost savings over earlier C-130 models. Compared to older C-130s, the J model climbs faster and higher, flies farther at a higher cruise speed, and takes off and lands in a shorter distance. Recapitalizing the USNR C/KC-130T fleet with KC-130J aircraft would eliminate a decade of limited readiness that will occur while the fleet endures a significant upgrade effort. At a time when DoD is posturing for a high end fight and will rely on all logistics available, the recapitalization to KC-130J is of paramount importance.

Step #3: Make Appropriation Decision. The decision to upgrade, replace or divest is informed by the level of risks being assumed by the force.

Decision to Upgrade. **Yes.** Navy has already committed to upgrading the C/KC-130T fleet with funding promised in and beyond the FY 2021 FYDP. This would allow the fleet to continue operating for decades to come. However, with all other services transitioning or already flying

KC-130J, upgrades may not be enough for the USNR to keep costs manageable while operating a legacy aircraft in the future.



Decision to Replace. **N/A.** The C-130 and the C-40 are the right aircraft for the Navy's airlift requirement. They provide complimentary but unique capabilities. The Navy does not need a different airlift platform it needs an upgraded or a new one.

Decision to Procure New Equipment. **Yes.** There is no question procurement is a sound decision in the long term. However, cost to recapitalize the entire fleet presents a bill too large for Navy to prioritize over other priorities at this time. Costs to upgrade are affordable today. The longer funding is provided to upgrade the fleet in lieu of recapitalization, the less palatable recapitalization will be, despite higher cost to operate the legacy platform.

Decision to Divest. **No**. Navy cannot afford to divest of the capability provided by the C-130. In a high end fight, which is likely to force distributed operations, C-130 lift is essential. Unprepared field operations and the need to airlift large, Navy-unique cargo will require the versatility the C-130 provides.

Status. USNR C/KC-130T have funding programmed into the FY 2021 FYDP for upgrades to this legacy fleet. The upgrades this funding supports will take at least a decade to be installed on all 24 aircraft. During this period, a number of aircraft at a time will be unavailable for tasking as they receive upgrades. Once complete with upgrades, the USNR fleet may be the only organization operating legacy C-130, likely at higher cost and lower readiness than those operating KC-130J. Navy committed funding to recapitalization in FY 2019 but was forced to eliminate future funding in FY 2020 due to pressures of higher priority requirements. Procuring KC-130J remains the number two equipping priority of the USNR.

Step #4: Monitor prioritization of equipment. Through increased oversight and transparency, monitor appropriation to gain full value and ensure effective stewardship of resources.

Summary: This example provides an illustration of the necessity to develop a recapitalization plan that considers and invests in the reserve component as a part of the total force. If the Navy prioritizes its requirement for intra-theater logistics, it is essential to consider recapitalization of the C/KC-130T fleet with the C-130J or an appropriate follow-on platform.

Appendix D
Joint Assessment on Efforts to Achieve Parity (Army)

DEPARTMENT OF THE ARMY
WASHINGTON DC 20310

MEMORANDUM FOR Deputy Assistant Secretary of Defense for Readiness, 1500 Defense Pentagon, Washington, DC 20301-1500

SUBJECT: Joint Parity Assessment National Guard and Reserve Component Equipment Report

1. References:

(a) Title 10 United States Code, Section 10541, "National Guard and Reserve Component Equipment: Annual Report to Congress."

(b) Headquarters, Department of the Army, Fiscal Year 2019 National Defense Authorization Act, Subtitle B – Army Programs, Section 111.

2. In accordance with reference b, we submit our joint assessment of modernized equipment parity for Fiscal Year 2022 among the Regular Army, Army National Guard and Army Reserve with the enclosed report (National Guard and Reserve Component Equipment Report). This assessment reveals that while the Army lacks equipping parity today across the three Components, the modernization disparity between the Components is reduced significantly between FY21 and FY26 based on planned fielding schedules.

3. The Army equips units based on Combatant Commanders requirements and employment timelines supporting the National Defense Strategy within the resources available. The Army is committed to modernizing our equipment portfolio to ensure our Soldiers have the capabilities required to deter – and if deterrence fails – to win against near peer adversaries. There is one Army – the Total Army - comprised of the three Components. As such, the Army is committed to modernizing the Regular Army, Army National Guard and Army Reserve to ensure our formations – regardless of Component - are combat effective and interoperable.

SUBJECT: Joint Parity Assessment National Guard and Reserve Component Equipment Report

4. The point of contact for this memorandum is HQDA G-8 Force Development, Colonel Eric A. Hoggard, Chief, Resource Documentation Division, at 703-695-4593 or eric.a.hoggard.mil@mail.mil.

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This is the third annual joint (CSA and CNGB) assessment of the Army's efforts to achieve parity as required by the amended Section 111 of the 2019 National Defense Authorization Act (NDAA), 10541 of Title 10, U.S.C. The Amended Title 10 USC 10541 directed an assessment of the modernization and parity of five systems: Abrams, Bradley, Stryker, Apache, and Black Hawk.[1] The three Army components agreed to include two additional systems for modernization assessment. The first is the Joint Battle Command–Platform (JBC-P) because it affects interoperability across the components. The second is the Load Handling System (LHS) Compatible Water Tank Rack (HIPPO) with 2,000-Gallon capacity because it is a critical materiel solution for Large Scale Combat Operations gap #4 and a crucial Critical Dual Use item. The Army's top priority through 2022 is rebuilding warfighting readiness. As the Army rebuilds readiness, there will be simultaneous efforts on research and development for six modernization priorities: Long-Range Precision Fires Next Generation Combat Vehicles, Future Vertical Lift, Air and Missile Defense Capabilities, Army Network, and Soldier Lethality.

The Army assessed modernization and parity among the separate components by comparing each system's total component requirement against the system's "modern" and "most modern" variants for FY 2021 and the latest Army approved position of FY 2026.[2] The Army identified all the line item numbers (LINs) of these systems, their MOD level (as described below), and their authorization and on-hand quantities[3] by component for FY 2021 and FY 2026.[4] The analysis included a summary of requirements, on-hand quantities, and a parity assessment for the five high-priority items of equipment required by the NDAA, as well as two other items included by agreement with all components of the Army.

Definition of Modern Equipment: The Army categorizes equipment in modernization levels (MLs) based on the Acquisition Phases established in the Department of Defense 5000 instruction series. Our most modern equipment, approaching the end of Engineering, Manufacturing and Development (EMD) or in low rate initial production (LRIP), is in ML 5. This early classification facilitates documentation and planning before fielding begins. ML4 equipment is normally in full-rate production, with the Army modernizing as quickly as resources and production allow procurement. In the sustainment phase, equipment is mostly in ML3. Equipment that is no longer adequate for combat or is for training purposes only is in ML2. ML1 represents obsolete equipment Army does not authorize for documentation on a unit's Modified Table of Organization and Equipment (MTOE). To facilitate discussion— "modern' refers to ML3 equipment and "most modern" refers to ML 4 and 5 equipment.

The one standard to measure readiness and equipping must assess how well we are modernizing equipment for all components. The objective of Army equipping is to maintain the highest level of unit readiness to provide Soldiers and formations the most modern equipment available. This

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[1] H.R.5515, "John S. McCain National Defense Act for Fiscal Year 2019." Subtitle B Army Programs, SEC. 111, Amended. National Guard and Reserve Component Equipment Report.
[2] OSD guidance was for the Army to provide an assessment of the current year FY 2021 to FY 2024. Army compared FY 2021 to FY 2026, which is the approved Army modernization position, to provide a complete picture for the system modernization path.
[3] LINs data generated from the Army Common Operating Picture (AR-COP) inventory file as of date 20 July 2020.
[4] Structure and Composition System 2006 database used to depict current modernization levels and modernization levels achieved at the end of POM26.

one standard must distinguish between equipping readiness based on today's requirements and the modern requirements of tomorrow.

Definition of Parity: Congress amended section 10541(b) of Title 10 to require "*a joint assessment by the Chief of Staff of the Army and the Chief of the National Guard Bureau on the efforts of the Army to achieve parity among the active component, the Army Reserve (USAR), and the Army National Guard with respect to equipment and capabilities*."

This joint assessment will compare inventories of the following equipment in each component:

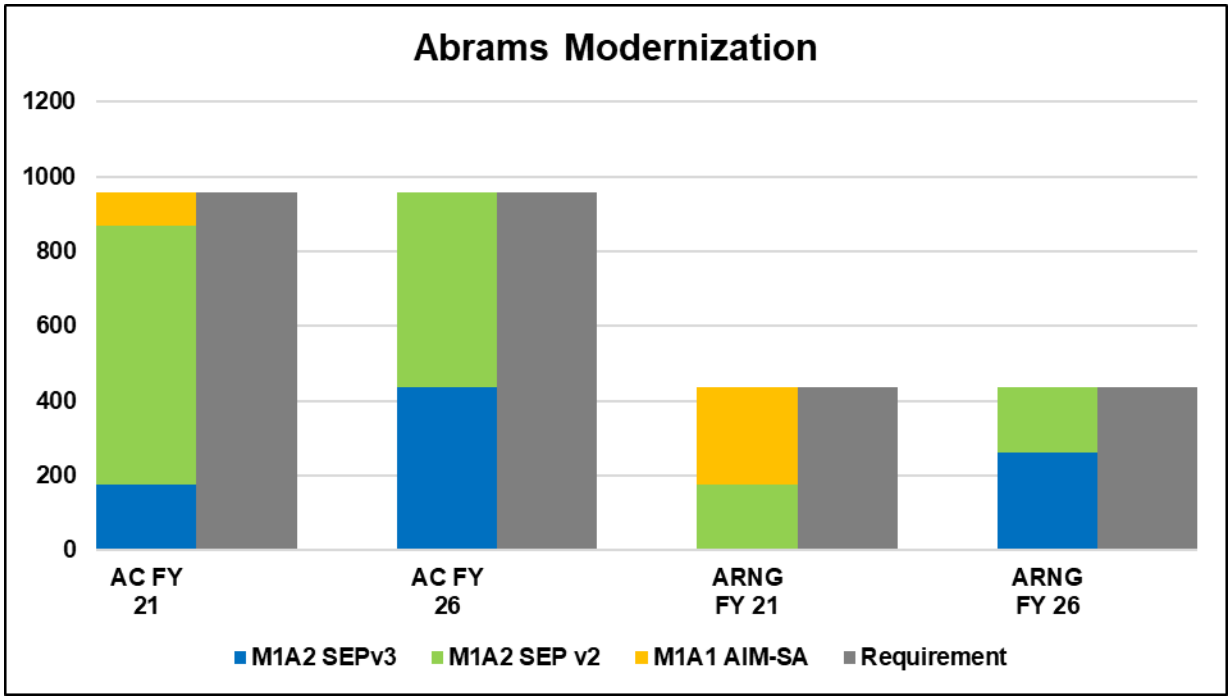
(A) AH–64 Attack Helicopters;
(B) UH–60 Black Hawk Utility Helicopters;
(C) Abrams Main Battle Tanks;
(D) Bradley Infantry Fighting Vehicles;
(E) Stryker Combat Vehicles; and
(F) Any other items of equipment identified as high priority by the Chief of Staff of the Army or the Chief of the National Guard Bureau.

The definition of parity as articulated in statute implies parity as being the same variant of a weapon system, platform, or capability within like formations in each component. In other words, the exact same equipment across same MTOE units in the total Army or "pure-fleet." However, finite resources, extended procurement, and distribution timelines limit the Army's ability to equip all like-type formations with the same variants of key equipment. Additionally, to deter and defeat the most dangerous threats effectively, the Army must maintain capability overmatch of key weapon systems with near-peer adversaries by developing and fielding improved, more lethal capabilities to the force while simultaneously maintaining sufficient capacity. Consequently, Army leadership will assume risk by fielding some formations with less modern but still interoperable and capable variants of key systems to balance capability and capacity requirements.

I. Joint Assessment

The Army equips component units to support the combatant commander (CCDR) based on anticipated deployment and employment requirements. Multi-Domain Operations (MDO) is the foundation of the Army Modernization Strategy. The MDO is how the Army supports Joint Forces in the rapid and continuous integration across all domains of warfare—land, sea, space, and cyberspace—to deter adversaries and win the fight should deterrence fail. Of the seven systems assessed, the Army has sufficient MOD level 3 and 4 equipment on hand to meet priority mission requirements. However, a higher percentage of MOD level 4 items reside in the Active Component (AC) (COMPO 1) as guided by the CCDR requirements and available resources.

A. Abrams Main Battle Tank



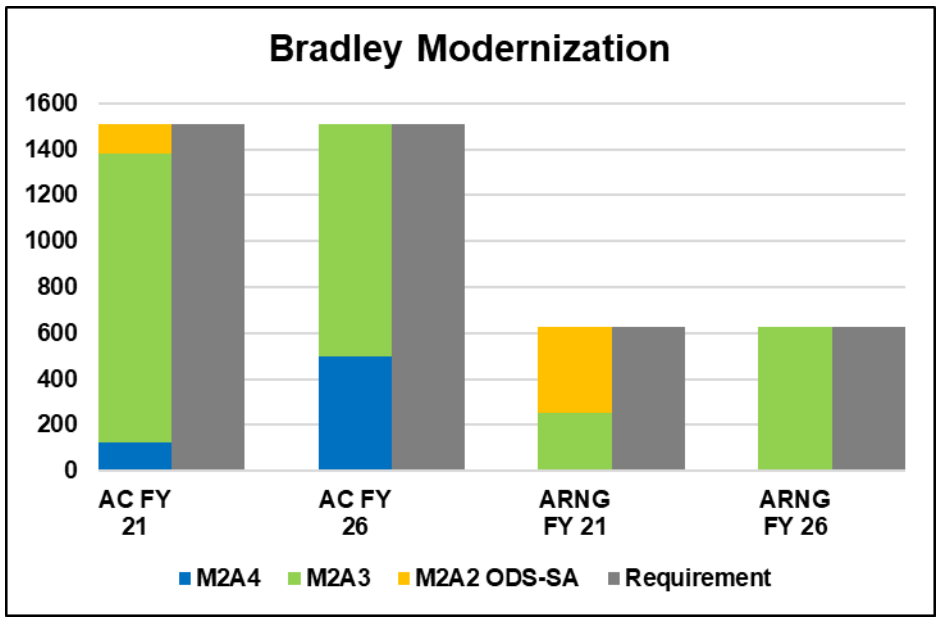
	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026
M1A1 AIM-SA (MOD 3)	87	0	261	0
M1A2 SEP v2 (MOD 3)	696	522	174	174
M1A2 SEPv3 (MOD 4)	174	435	0	261
Requirement	957	957	435	435

The Army currently employs three variants of the Abrams tank: the M1A1 AIM-SA, M1A2 SEP v2, and the M1A2 SEPv3. The newest tank, the M1A2 SEPv3, is in production and was fielded to the first unit equipped, the Army Preposition Stocks (APS) in Europe, in FY 2020. The Army will field one Armored Brigade Combat Team (ABCT) per year beginning in FY 2021. Per Headquarters, Department of the Army (HQDA), Executive Order (EXORD) 267-20, Modernization of Abrams and Bradley Fleets, the M1A2 SEPv3 will be fielded to APS (Set# 1), AC units (Set# 2–6), and Army National Guard (ARNG) (Set# 7–9) to replace the M1A1 AIM-SA, between FY 2023–2024.

Beginning in FY 2025, the M1A2 program of record will see a substantial lethality enhancement with the adoption of the M1A2 SEPv4 systems. The M1A2 SEPv4 will be fielded with 3rd Generation Forward Looking Infrared, improved Commander's Primary Sights, engine fuel usage and reliability improvements, and an improved thermal management system (electric).

Parity Assessment. The Army is committed to continuing Abrams modernization at a rate of one ABCT per year. The first two ABCTs, APS 2.2 (Europe) and 3rd Brigade Combat Team, 1st Cavalry Division (3/1 CD) received their M1A2 SEPv3 tanks in late FY 2020. At this one ABCT per year modernization rate, the Army expects to achieve parity by FY 2034.

B. Bradley Fighting Vehicle



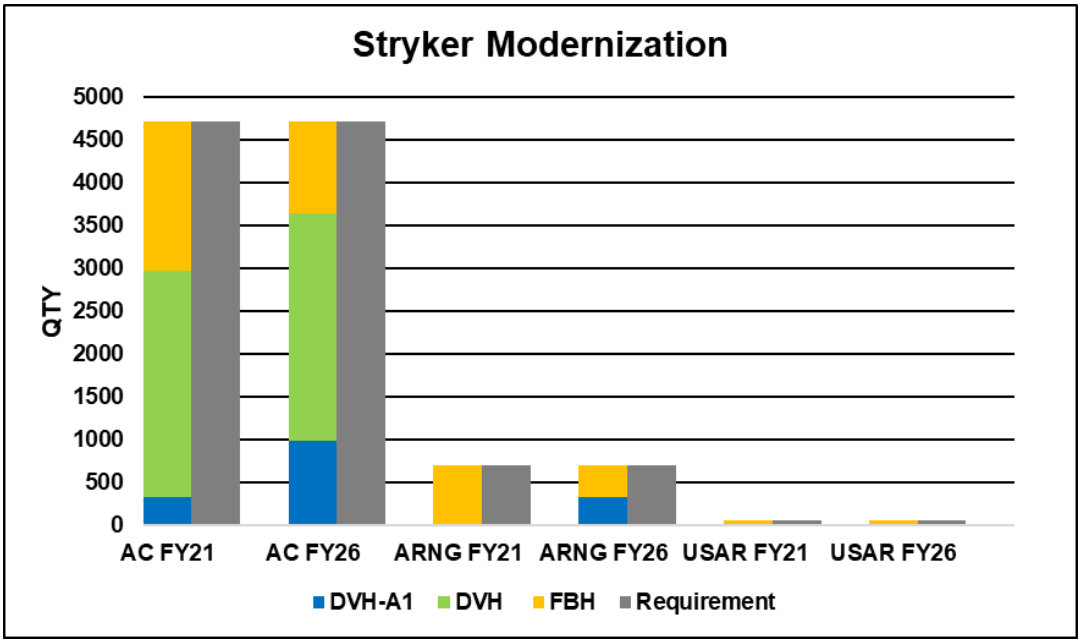
	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026
M2A2 ODS-SA (MOD 3)	125	0	375	0
M2A3 (MOD 3)	1,258	1,008	250	625
M2A4 (MOD 4)	125	500	0	0
Requirement	1,508	1,508	625	625

The Army currently employs two Bradley variants for training and operations: M2A2 ODS-SA and the M2A3. The newest upgrade to the Bradley, the M2A4, is in initial production and will begin fielding to APS in Europe in FY 2021. The Army will field one ABCT per year beginning in FY 2021. As the Army fields the M2A4 to AC units, excess M2A3s will cascade to the remaining three ABCT ARNG units.

There is minimal risk with having four ABCTs (1xAC / 3xARNG) equipped with the M2A2 ODS-SA. The AC units will retain the ODS-SA Bradley variant until 4QFY21; at that time, they will divest of the ODS-SA variant and receive the M2A4 Bradley variant. The ARNG will retain the ODS-SA until approximately 1QFY23 at which time the first ARNG unit will receive the M2A3 variant, followed by the next tentative fielding of the second ARNG unit to receive the M2A3 in 4QFY23. The Army has scheduled the last ARNG unit to receive the M2A3 tentatively for 2QFY24. The primary difference between the two platforms is that the M2A2 ODS-SA digital communication systems are on the edge of obsolescence. The M2A3 is equipped with modernized digital systems that are currently across the force. Additionally, the M2A3 is equipped with the Commander's Independent Viewer (CIV), a thermal sight increasing the survivability and lethality of the M2A3 variant.

Parity Assessment. The ARNG will receive M2A3 variants from the AC beginning in FY 2023. Once the fielding of the cascaded equipment is complete in FY 2025, the ARNG will be one variant behind the most modern units.

C. Stryker Vehicle



	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026	USAR FY 2021	USAR FY 2026
DVH-A1 (MOD 4)	331	933	0	331	0	0
DVH (MOD 4)	2,648	2,648	0	0	0	0
FBH (MOD 3)	1,735	1,073	707	376	56	56
Requirement	4,714	4,714	707	707	64	64

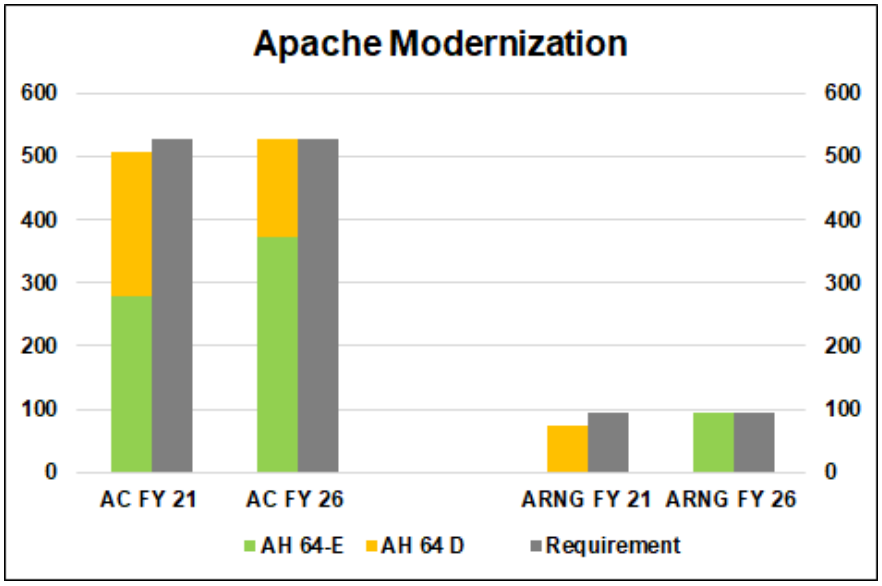
Currently, there are nine Stryker Brigade Combat Teams (SBCTs) in the Army: three Double-V Hull (DVH) SBCTs and six Flat Bottom Hull (FBH) SBCTs. The AC SBCTs comprise seven SBCTs: three DVH SBCTs and four FBH SBCTs. There are two FBH Stryker BCTS in the ARNG. There are 56 Nuclear Biological Chemical Reconnaissance Stryker variants (FBH MOD3) in the Army Reserve.

Stryker modernization includes two parallel efforts: FBH to DVHA1 conversions and lethality upgrades. Lethality enhancements include upgrading remote weapon stations to Common Remotely Operated Weapon Station-Javelin systems; upgrading the Tube-launched, Optically Tracked, Wire-guided missile launch systems; and integrating a 30mm Medium Caliber Weapon System in an unmanned turret.

The FBH SBCTs (five AC and two ARNG) have greater strategic mobility but reduced protection to underbelly blast when compared to the DVH SBCTs.

Parity Assessment. The current procurement plan to upgrade to the DHVA1 spans approximately 14 years. The DVHA1 fielding will occur FY 2021–2030 for six SBCTs comprising four COMPO 1 SBCTs (two of four ID currently receiving their allotment of DVHA1) and two COMPO 2 SBCTs (81st and 56th SBCTs, beginning in ~FY 2026) to achieve full DVHA1 modernization. The Army expects to achieve parity across the Stryker fleet by FY 2030.

D. AH-64 Apache



	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026
AH 64-D	280	371	0	96
AH 64-E	226	157	75	0
Requirement	528	528	96	96

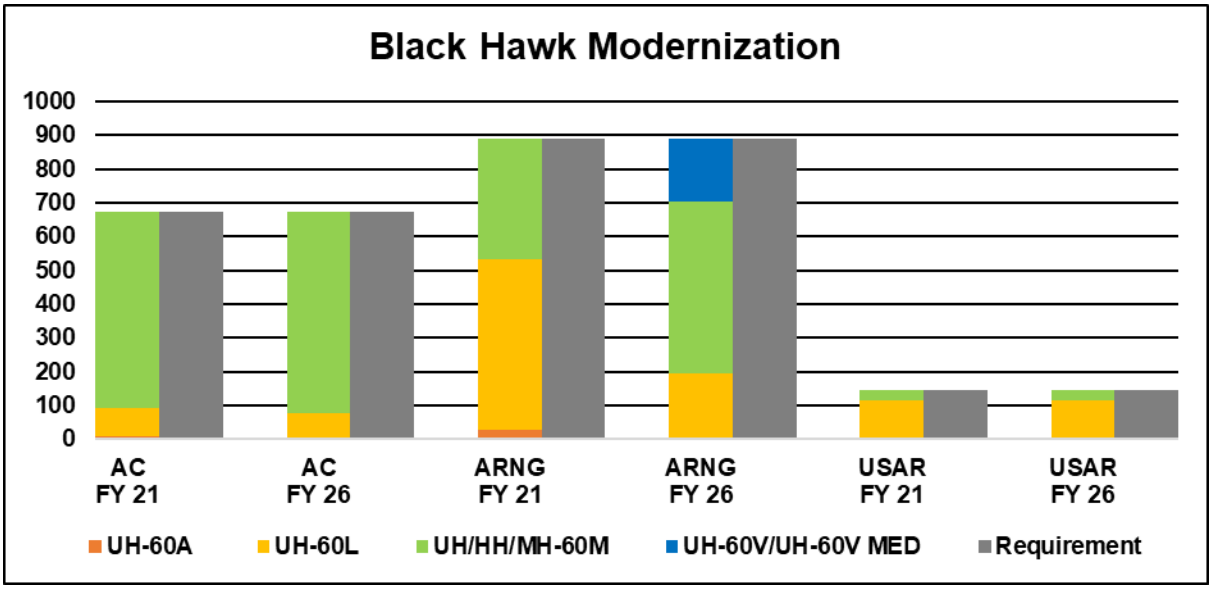
The Army has two variants of Apache in inventory, depicted in the chart.

The modernization strategy for Apache is the complete remanufacture of the AH-64D using a new airframe and re-using over 700 parts. The result is that the Army has fully digitized the most modern attack helicopter, the AH-64E, with the latest technology. Improvements include improved drive and propulsion systems, composite main rotor blades, unmanned aircraft system level III-IV control, improved communications suite, Link-16, Removable Crashworthy Fuel System, Maritime Targeting Mode on the Fire Control Radar, Image Blending, multi-mode laser, and others.

The Army will field ARNG Attack Reconnaissance Battalions in FY 2022, FY 2023, FY 2025, and FY 2026. The AC will only field 20 of 22 AH-64E battalions and will retain two D-model battalions until the Army fields Future Attack Reconnaissance Aircraft in 2030/31. The risks associated with a mixed fleet of AH-64 variants include the requirement to maintain separate prescribed load list/supply chains, redundant maintenance support for both fleets, interoperability issues, and obsolescence issues.

Parity Assessment. Under the current fielding plan, the Army expects to achieve parity for the AH-64E in the ARNG by FY 2026.

E. H-60 Black Hawk



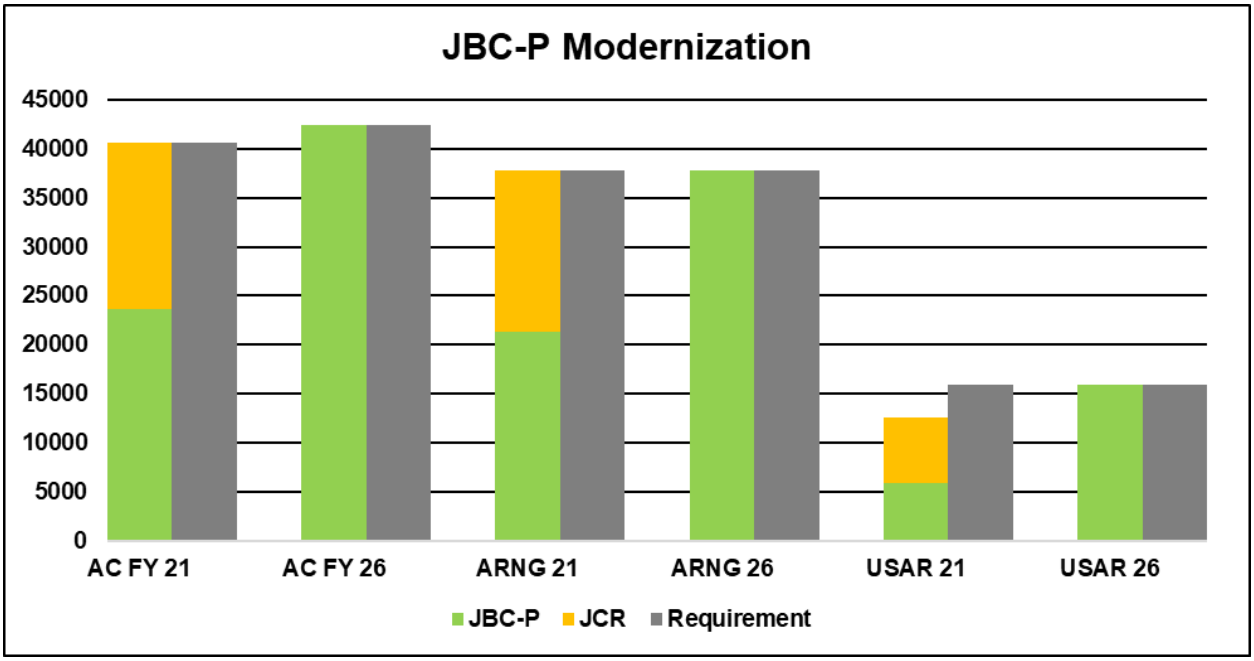
	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026	USAR FY 2021	USAR FY 2026
UH-60A	7	0	29	0	0	0
UH-60L	86	78	502	193	114	114
UH/HH/MH-60M	579	594	360	511	30	30
UH-60V/UH-60V MED	0	0	0	187	0	0
Requirement	672	672	891	891	144	144

The Black Hawk is the multi-purpose medium-lift helicopter in the Army's inventory. Multiple variants support various mission requirements within the Army's inventory.

The Army's plan for modernizing its entire UH-60 aircraft fleet will be accomplished by divesting of all UH-60A aircraft by FY 2024, procuring the UH/HH through FY 2026, and recapping the UH-60L into the UH-60V and UH-60V MED from FY 2018 through FY 2030. Modernization within the Guard will be accomplished by recapitalizing and digitizing the UH-60L fleet into the UH-60V series and procuring new build H-60M aircraft. Both of these initiatives will support the divestment of H-60As, as will cascading of H-60Ls to backfill H-60A equipped units. Upon completion of Army Aviation H-60 procurement objectives, the ARNG end state fleet will consist of 891 UH-60 aircraft: 193 UH-60L, 511 H-60M, and 187 UH-60V. The numbers include both assault/command and control and medical evacuation variants. Delays in modernization cause extended reliance on outdated analog and federated H-60L cockpit systems, which significantly reduce situational awareness, increase pilot workload, and decrease mission readiness.

Parity Assessment. The current fielding plan completes fielding of the ARNG H-60M requirement in FY 2028, in line with Army objectives. Recent changes to the Army's Black Hawk modernization strategy will result in the Army achieving parity of all authorized ARNG and USAR Black Hawks by FY 2034.

F. Joint Battle Command–Platform (JBC-P)



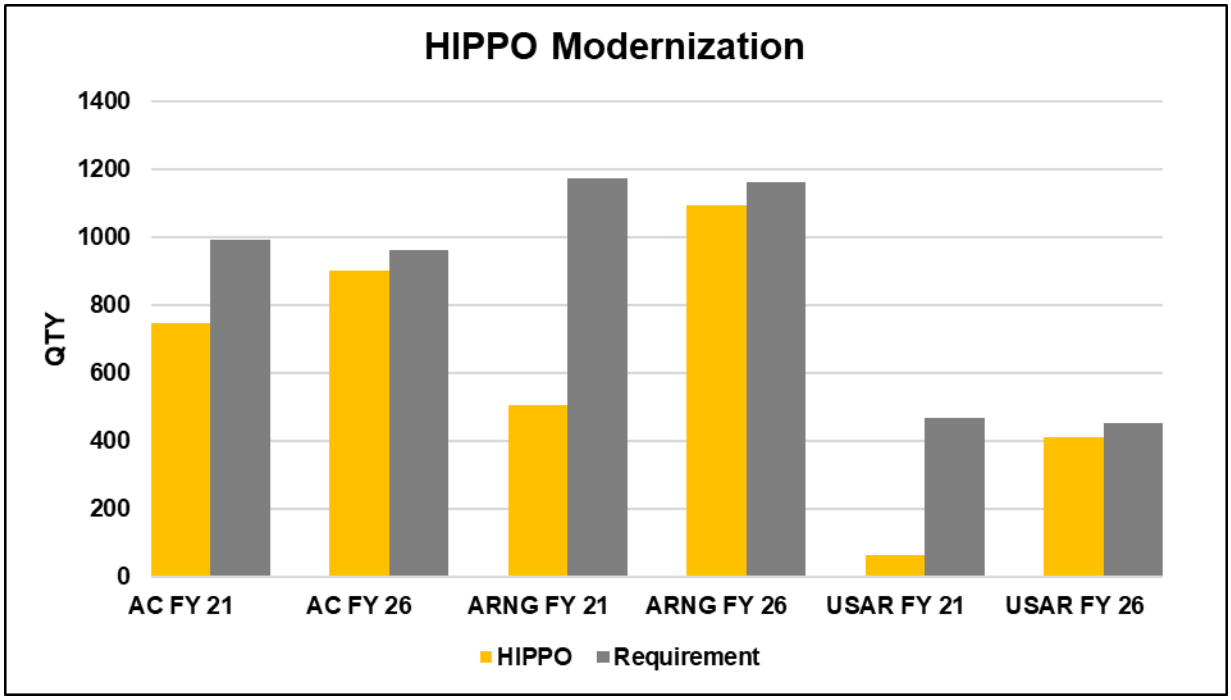
	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026	USAR FY 2021	USAR FY 2026
JBC-P (MOD 4)	23,652	42,433	21,313	37,775	5,870	15,870
JCR (MOD 3)	16,940	0	16,517	0	6,642	0
Requirement	40,592	42,433	37,830	37,775	15,870	15,870

The JBC-P provides Mission Command-on-the-Move and situational awareness across all echelons and formation types. As part of the Mission Command modernization strategy, the Army chose to include JBC-P as an additional system in this report to highlight the importance of mission command interoperability to meet the Army's requirements in Joint operations.

The Army is modernizing the JBC-P family of systems by divesting the Joint Capabilities Release and replacing it with the JBC-P. The less modernized JBC-P systems do not address today's cyber vulnerabilities. The Army accelerated this replacement by increasing JBC-P investments by $781 million above the previous base in FY 2017–2022.

Parity Assessment. The Army is reviewing requirements to ensure they provide full interoperable Command and Control and situational awareness capabilities to the Total Force. Further analysis may increase the objective end-state requirements as Army Force Structure continues to evolve—influencing what is parity and when we achieve it. The Army expects to pure-fleet JBC-P to the Army Procurement Objective by FY 2025.

G. Load Handling System (LHS): 2,000 Gallon Comp Water Tank-Rack (HIPPO)



	AC FY 2021	AC FY 2026	ARNG FY 2021	ARNG FY 2026	USAR FY 2021	USAR FY 2026
HIPPO (MOD 4)	746	904	508	1,095	64	412
Requirement	994	962	1,173	1,162	468	454

The HIPPO is the LHS Compatible Water Tank Rack System (HIPPO) with a 2,000-gallon potable water tank mounted in an International Organization for Standardization frame. The HIPPO has freeze protection and has a water pump, hose reel, and filling station. It can execute bulk load and discharge, retail distribution, and bulk storage of potable water. The HIPPOs replaced the 3,000 Semi-Trailer Mounted Fabric Tank and most Forward Area Water Point Supply systems.

The HIPPO provides unit distribution and supply point distribution capability to our force. The Army will employ the HIPPO throughout the theater of operations and as far forward as the Brigade Support Area (BSA). The HIPPO will support combat arms, combat service, and combat service support units within the corps/division area. The HIPPO allows water transport directly from water purification points to the supported maneuver units.

Having achieved 80 percent modernization within COMPOs 1 and 6 in support of Army Early Entry priorities (European Command and Indo-Pacific Command), Army will now increase distribution to COMPOs 2 and 3 from FY 2022 to FY 2026.

Parity Assessment. In FY22 the Army, through HIPPO Modernization, is projected to field 29 HIPPOs to COMPO 2 and 17 HIPPOs to COMPO 3. The Army expects to achieve parity by FY 2028.

Appendix E
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Appendix F
Abbreviations

Acronym	Nomenclature
AAO	Approved Acquisition Objective (Marine Corps)
AAV	amphibious assault vehicle
ABCT	Armored Brigade Combat Team
AC	Active Component
ACA	Aerospace Control Alert
ACC	Air Combat Command
ACS	Agile Combat Support
ACV	Amphibious Combat Vehicle
ADS-B	Automatic Dependent Surveillance-Broadcast
AEA	airborne electronic attack
AEG	Army Equipping Guidance
AESA	Active Electronically Scanned Array
AFB	Air Force base
AFR	Air Force Reserve
AFRC	Air Force Reserve Command
AFSOC	Air Force Special Operations Command
AFSPC	Air Force Space Command
AGSE	aviation ground support equipment
AH	attack helicopter
AIFF	advanced identification, friend or foe
AM	amplitude modulation
AMC	Air Mobility Command (Air Force)
AMCM	airborne mine countermeasures
AMD	Air and Missile Defense
AMP	Avionics Modernization Program
ANG	Air National Guard
AOG	Air Operations Group
AR	Army Reserve
ARB	Air Reserve Base (Air Force)
ARC	Air Reserve Components
ARFORGEN	Army Force Generation
ARI	Aviation Restructuring Initiative
ARNG	Army National Guard
ASW	antisubmarine warfare
ASUW	anti-surface warfare
ATM	Air Traffic Management
BA	Battlefield Airmen
BATS	Battlespace Access Training Systems
BCA	Budget Control Act of 2011
BCC	Battle Control Center (Air Force)
BCT	brigade combat team
BFRMP	Boat Forces Reserve Management Plan
BLOS	beyond line-of-sight
BOIP	Basis of Issue Plan

C2	command and control
C4I	command, control, communications, computers, and intelligence
CAF	combat air forces
CART	cargo afloat rig team
CBPS	chemical/biological protective shelter
CBRN	chemical, biological, radiological, and nuclear
CBRNE	chemical, biological, radiological, nuclear, and high-yield explosives
CBT	common bridge transport
CCDR	combatant commander
CCMD	combatant command
CCT	Combat Controller Team
CDU	Critical Dual Use
CERFP	CBRNE Enhanced Response Force Package
CFT	Conformal Fuel Tanks
CNGB	Chief, National Guard Bureau
CNIFR	Commander, Navy Information Force Reserve
CNO	Chief of Naval Operations
CNS	Communication, Navigation, Surveillance
COMBATCAM	combat camera
CONUS	continental United States
COP	common operational picture
COTS	commercial off–the-shelf
CRC	control and reporting center
CRE	CBRN Response Enterprise
CRF	Coastal Riverine Force
CROWS	Common Remotely Operated Weapon Station
CRP	Core Radio Package
CRS	coastal riverine squadron
CSS	combat service support
CST	Civil Support Team
CTC	Combat Training Center
CTOC	Counter-Transnational Organized Crime
CW	cyber warfare
DC CD&I	Deputy Commander for Combat Development and Integration
DC I&L	Deputy Commander for Installations and Logistics
DCGS	distributed common ground system
DET	Displaced Equipment Training
DHS	Department of Homeland Security
DIB	defense industrial base
DIRECT	Disaster Incident Response Communications Terminal
DMS	distributed mission sites
DMSMS	diminishing manufacturing sources and material shortages
DoD	Department of Defense
DODD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOMOPS	Domestic Operations
DPAS	Defense Property Accountability System
DSCA	defense support of civil authorities
DV	distinguished visitor

EA	electronic attack
EAB	echelons above brigade
EMEDS	Expeditionary Medical Support
EMF	expeditionary medical facility
EO	electro-optical
EOD	explosive ordnance disposal
EOH	equipment on-hand
EPAWSS	Eagle Passive Active Warning Survivability System
ETR	Equipment Transparency Report
EUL	economic useful life
FAA	Federal Aviation Administration
FATS	Firearms Training Simulator
FEMA	Federal Emergency Management Agency
FIAR	Financial Improvement and Audit Readiness
FLSW	Fleet Logistics Support Wing
FM	frequency modulation
FMTV	Family of Medium Tactical Vehicles
FOC	full operational capability
FoV	Family of Vehicles
FPL	Force Protection, Large
FTU	formal training unit
FUA	Fixed Wing Utility Aircraft
FY	fiscal year
FYDP	Future Years Defense Plan
G/ATOR	Ground/Air Task Oriented Radar
GA	Guardian Angel
GBSAA	Ground-based Sense and Avoid
GCS	ground control station
GCSS-A	Global Combat Support System-Army
GFM	Global Force Management
GFMAP	Global Force Management Allocation Plan
GOTS	government off–the-shelf
GPS	Global Positioning System
HD	homeland defense
HEA	Heavy Equipment Airdrop
HEMTT	heavy expanded mobility tactical truck
HH	Hospital Helicopter
HIPPO	Load Handling System Compatible Water Tank Rack
HMEE	High Mobility Engineer Excavator
HMIT	helmet-mounted integrated targeting
HMMWV	high mobility multipurpose wheeled vehicle
HQDA	Headquarters, Department of the Army
HRF	Homeland Response Force
HSC	helicopter sea combat squadron (Navy)
HSM	helicopter maritime strike squadron
HTV	Heavy Tactical Vehicle

HYEX	Hydraulic Excavators
IBCT	Infantry Brigade Combat Team
IEW	intelligence and electronic warfare
IOC	initial operational capability
IP	Internet protocol
IR	infrared
IRST	Infrared Search and Track
ISO	International Organization for Standardization
ISR	intelligence, surveillance, and reconnaissance
ITAS	Improved Target Acquisition System
IUID	Item Unique Identification
JAB	Joint Assault Bridge
JB	Joint Base
JBC-P	Joint Battle Command-Platform
JCR	Joint Capabilities Release
JHMCS	joint helmet-mounted cueing system
JISCC	Joint Incident Site Communications Capability
JLTV	Joint Light Tactical Vehicle
JRB	joint reserve base
JRIC	Joint Reserve Intelligence Center
JSTARS	Joint Surveillance Target Attack Radar System
JTRS	Joint Tactical Radio System
kHz	kilohertz
kW	kilowatt
LAIRCM	Large Aircraft Infrared Countermeasures
LAV	light armored vehicle
LCS	littoral combat ship
LEEK	Law Enforcement Ensemble Kit
LHS	Load Handling System
LOS	line-of-sight
LSRS	littoral surveillance radar system
LTV	Light Tactical Vehicle
LVSR	Logistics Vehicle System Replacement
MAF	mobility air forces
MASS	Modular Aerial Spray System (Air Force)
MAW	Marine Aircraft Wing
MCS	Maneuver Control System
MDS	mission design series
MECP	Mobile Entry Control Point
MEDEVAC	medical evacuation
MEOH	Modernized Equipment On-hand (MEOH) (Army)
MFS-TRM	Modular Fuel System-Tank Rack Module
MH	multimission helicopter
MIDS	Multi-functional Information Distribution System
MIO	maritime interdiction operations

MIRCS	Mobile Integrated Remains Collection System
MISO	military information support operations
MMCT	Multi-Mission Crew Trainers
MPRA	maritime patrol and reconnaissance aircraft
MPRF	Maritime Patrol and Reconnaissance Force
MRAP	Mine Resistant Ambush Protected
MSC	Military Sealift Command
MTOE	modified table of organization and equipment
MTRRS	Mobile Tactical Retail Refueling System
MTV	medium tactical vehicle
MTVR	Medium Tactical Vehicle Replacement
NAS	naval air station
NAVAIR	Naval Air Systems Command
NAVELSG	Navy Expeditionary Logistics Support Group
NBC	nuclear, biological, and chemical
NBCRV	NBC Reconnaissance Vehicle
NCF	naval construction force
NCFA	National Commission on the Future of the Army
NCHB	Navy cargo handling battalion
NCR	naval construction regiment
NDAA	National Defense Authorization Act
NEIC	Navy Expeditionary Intelligence Command
NELR	Navy expeditionary logistics regiment
NET	New Equipment Training
NG	National Guard
NG CIMS	National Guard CRE Information Management System
NGB	National Guard Bureau
NGREA	National Guard and Reserve Equipment Appropriation
NGRER	National Guard and Reserve Equipment Report
NMCB	naval mobile construction battalion
NST	Network Operations Support Team
NSW	naval special warfare
NSWG	naval special warfare group
NUFEA	Navy-unique fleet-essential airlift
O&M	Operation and Maintenance
OA	Open Architecture
OASD(R)	Office of the Assistant Secretary of Defense for Readiness
OASD(R),RP&R	OADR(R), Readiness Programming and Resources
OCO	overseas contingency operations
OM	Operations Module (Air Force)
OPTEMPO	operating tempo
OSD	Office of the Secretary of Defense
OSRVT	One System Remote Video Terminal
P-1	Service Procurement Programs
P-1R	Service Procurement Programs - Reserve Components
PIM	Paladin Integrated Management
PIRL	Prioritized Integrated Requirements List

PLS	palletized load system
POM	program objective memorandum
PPBE	Planning, Programming, Budgeting, and Execution
PPP	public-private partnerships
PRESBUD	President's Budget
Prime BEEF	Prime Base Engineer Emergency Force
PRP	Personnel Retrieval and Processing
PSU	port security unit
PSU	port security unit
PWCS	ports, waterways, and coastal security
RB-S	Response Boat-Small
RC	Reserve Component
RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer
RERP	reliability enhancement and re-engining program
RPA	remotely piloted aircraft
RSS	Relocatable Simulator Shelter (Air Force)
RTIC	Real Time Information in the Cockpit
RWR	radar warning receiver
RWST	Reconfigurable Weapons System Trainer
S2E2	Survivable/Endurable Evolution
SABIR	Special Airborne Mission Installation and Response
SATCOM	satellite communications
SBIRS	Space-Based Infrared System
SE	support equipment
SEAL	sea-air-land
SELRES	Selected Reserve
SERE	survival, evasion, resistance, and escape
SF	security forces
SHORAD	Short Range Air Defense
SLEP	service life extension program
SLOS	secure line-of-sight
SMP	Strategic Master Plan (Air Force)
SMTC	Special Missions Training Center
SOF	special operations forces
SPAWAR	Space and Naval Warfare Systems Command
SPCS	space control squadron
SPPAD	Single Pass Precision Airdrop
SRM	Sustainable Readiness Model
SRP	SPAWAR Reserve Program (SRP)
STANO	Surveillance, Target Acquisition, and Night Observation
STUAS	Small Tactical Unmanned Aircraft System
SURGEMAIN	Naval Sea Systems Command - Surge Maintenance
T/A	Training Allowance (Marine Corps)
T/E	Table of Equipment
TACP	tactical air control party
TCAS	Traffic Alert and Collision Avoidance System
TDA	Table of Distribution and Allowances (Army)

TF	Total Force
TF-C	Total Force Continuum
TOA	table of allowance (Navy)
TPSB	transportable port security boat
TSU	tactical support unit
TSW	Tactical Support Wing
TTP	tactics, techniques, and procedures
TWV	tactical wheeled vehicle
U.S.	United States
U.S.C.	United States Code
UAS	unmanned aircraft system
UDLM	unscheduled depot level maintenance
UDP	unit deployment program
UHF	ultrahigh frequency
UPL	Unfunded Priority List
USAF	United States Air Force
USAR	United States Army Reserve
USCG	United States Coast Guard
USCGR	United States Coast Guard Reserve
USMC	United States Marine Corps
USMCR	United States Marine Corps Reserve
USNORTHCOM	United States Northern Command
USNR	United States Navy Reserve
USSOCOM	United States Special Operations Command
USTRANSCOM	United States Transportation Command
VAQ	tactical electronic warfare squadron (Navy)
VFA	strike fighter squadron (Navy)
VFC	fighter squadron composite (Navy)
VHF	very high frequency
VITE	Virtual Interconnected Training Environment
VP	patrol squadron (Navy)
VR	Fleet Logistics Support Squadron (Navy)
WIN-T	Warfighter Information Network-Tactical
WMD	weapons of mass destruction
WMD-CST	Weapons of Mass Destruction - Civil Support Team
WR-ALC	Warner Robins Air Logistics Center

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