Department of Defense

National Guard and Reserve Equipment Report for Fiscal Year 2020

March 2019

NATIONAL GUARD AND RESERVE EQUIPMENT REPORT FOR FISCAL YEAR 2020

(NGRER FY 2020)

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

March 2019

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PERSONNEL AND
READINESS

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FOREWORD

As the DoD moves forward to meet the challenge of a rapidly evolving security environment, there is no question that an operational reserve will play a significant role. This requires that the National Guard and Reserve provide combat credible forces that are ready to deploy with little or no notice, and able to quickly and seamlessly assimilate with active units.

The strategic assessment set forth in the 2018 National Defense Strategy is clear; all formations in the Total Force must be interoperable, and equally lethal and survivable in order to "compete, deter, and win." As there is one standard for readiness to fight our Nation's wars, so must there be one standard for equipping. Consequently, it is imperative that there is no disparity between the Active Component and Reserve Component (RC) with respect to future modernization and recapitalization plans.

This year, at the direction of Congress, the Chief of Staff of the Army and the Chief, National Guard Bureau (CNGB) were required to provide an assessment on the efforts of the Army to achieve parity among the Active Army, the Army National Guard, and the Army Reserve with respect to equipment and capabilities. The Office of the Secretary of Defense (OSD) has provided a separate assessment of parity in chapter one, as well as an evaluation of the Army assessment presented in Appendix D.

Chapter one also includes a follow-up to the Department's plan to implement specific RC Budget Line Item Numbers (BLINs), designed to achieve full transparency and traceability of procurement funding, along with the oversight required by Congress. The Department has yet to realize this plan, and the CNGB has stated he will not be able to definitively certify the procurement or receipt of expected items for which funds were appropriated until specific RC BLINs, or something similar, is put in place. OSD recognizes that any resolution must fulfill congressional desire for increased transparency, while maintaining the Military Services' flexibility to address changing priorities.

Chapters two through six provide detailed narratives and data for each RC for FY 2020 and projected data through FY 2022. Overall, this report illustrates the reform, investment, and financial auditability needed to achieve a well-balanced, seamlessly integrated, and capabilities based Total Force.

Sincerely,

James N. Stewart
Assistant Secretary of Defense for Manpower
and Reserve Affairs, Performing the Duties
of the Under Secretary of Defense for
Personnel and Readiness

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Chapter 1
Overview

Without sustained and predictable investment to restore readiness and modernize our military to make it fit for our time, we will rapidly lose our military advantage, resulting in a Joint Force that has legacy systems irrelevant to the defense of our people. (2018 National Defense Strategy)

I. Introduction

Today's complex security environment is defined by rapid technological change, fiscal uncertainty, and challenges from adversaries in every operating domain. Near-peer threats have expanded the competitive space and closed gaps in both capability and capacity. In this contemporary operating environment, the Reserve Components (RC) provide an operational force that combatant commanders rely on during all phases of conflict.

As the Department of Defense (DoD) prepares to meet the challenge of this changing security environment, there is no question that an operational reserve will continue to play a significant role in future missions. In order to meet these demands, certain Reserve and National Guard units must be ready to deploy with little or no notice and quickly and seamlessly assimilate with active units. When supporting combatant commanders, RCs will require advanced technology hardware in order to ensure the same level of compatibility, survivability, lethality, mobility, and network connectivity as the Joint Force they are fighting alongside.

Rapidly evolving technologies and an equipping model that relies upon cascading older, legacy equipment to the RCs, risks outpacing the concept of a Total Force.

Unfortunately, there are significant systemic challenges with the current process for funding and procurement of new technology that impede the implementation of modernization strategies—particularly for the RCs which make up 40 percent of the total force. Rapidly evolving technologies and an equipping model that relies upon cascading older, legacy equipment to the RCs, risks outpacing the concept of a Total Force. Because the pace of competition is increasing, DoD will achieve and maintain a technological edge only by quickly translating new technology into a fielded capability.[1] However, this requirement for speed, within arcane and bureaucratic procurement and funding processes, compounds challenges for fielding new technology to the RC as RCs are often prioritized in the back end of the funding and fielding cycles (*Figure 1-1*). When RC requirements are not prioritized into capital investments, concurrent fielding of technology does not occur, adding to incompatibility challenges.

[1] Hon. Michael D. Griffin, Under Secretary of Defense for Research and Engineering, Hearing to Receive Testimony on Accelerating New Technologies to Meet Emerging Threats, Before the Subcommittee on Emerging Threats and Capabilities Subcomm. of the Senate Armed Services Comm., 115th Cong. (April 18, 2018), 8.

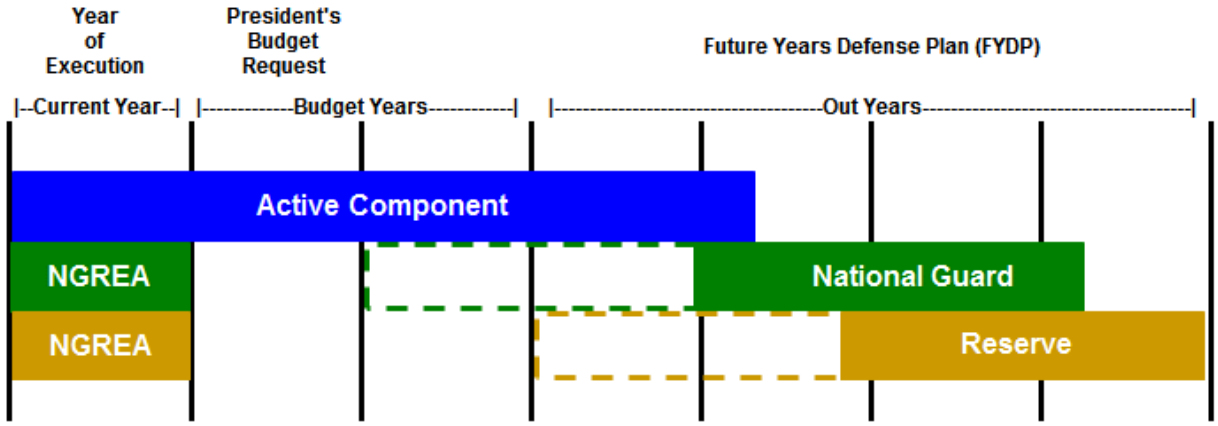

Figure 1-1. Conceptual Depiction of RC Equipping Trends—Procurement Prioritization

As a result, despite the requirements in DoD policy to manage the RCs as an effective operational force integrated with the Active Components (AC),[2] challenges associated with how equipping requirements are prioritized and funded continue to impede policy implementation designed to ensure transparent and timely fielding of current technology to the RCs. The existing equipping process and its associated challenges are described below.

Processes for Equipping Reserve Components: There are three fundamental mechanisms for funding and equipping the RC: Procurement Appropriations; Redistribution (Cascading); and, Congressional Provisions, including National Guard and Reserve Equipment Appropriations (NGREA) and Directed Appropriations.

Procurement Appropriations. Equipment procurement decisions are administered by each parent Service. Since the RC Chiefs do not serve as the appropriation sponsor, requests for RC procurement appropriations are submitted by the parent Services during the President's Budget (PRESBUD) submission. The PRESBUD's procurement request (P-1) reflects the Department's combined request for the AC and RC. The P-1R is provided as a unique subset to the P-1 budget exhibit and contains the Services' procurement budget request for the RC.[3]

Associated Challenges. Transparency remains the RC's most significant issue affecting funding and procurement of current technology for RC forces. While combining the AC and RC request for procurement appropriations provides added justification for Total Obligation Authority (TOA), the use of one procurement line for both AC and RC does not enable transparent tracking during execution. Although the P-1R is intended to reflect the RC procurement portion of the PRESBUD, it is non-binding and there is no requirement for the parent Service to account for adjustments to the P-1R once funds have been appropriated. The non-binding aspect of the P1-R

[2] DoDD 1200.17, Managing the Reserve Components as an Operational Force, (October 29, 2008), and DoDI 1225.06, Equipping the Reserve Forces, (May 16, 2012), Incorporating Change 1, (November 30, 2017), require 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.

[3] Ibid.

precludes the ability to audit how changes in line item funding affect procurement of RC equipment. Additionally, within this Service managed process, RCs are generally funded and fielded equipment in the back end of the cycle and are therefore more vulnerable to risks associated with the diversion of funds. As illustrated in *Figure 1-2*, once certain criteria are met, Services have the flexibility to divert funds to support changing priorities. In periods of fiscal uncertainty and declining budgets, as the Services race to keep pace with technology, programs critical to the RCs are disproportionately affected by AC reprioritization.

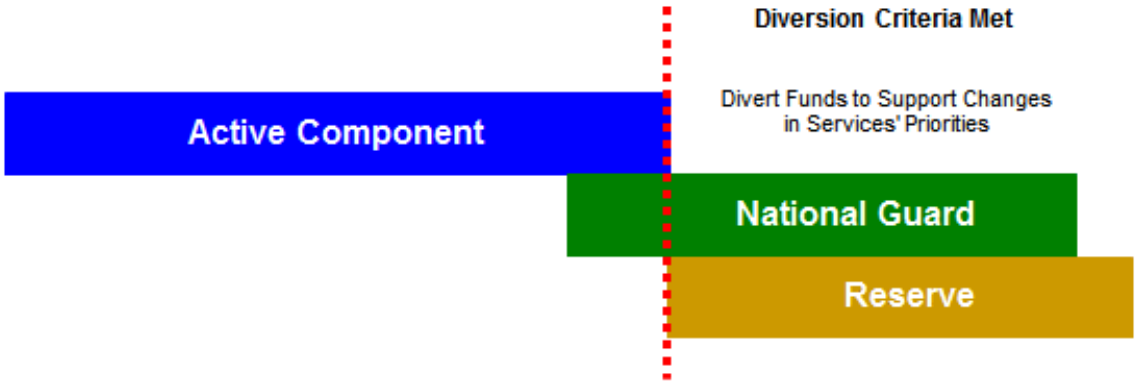

Figure 1-2. Conceptual Depiction of RC Equipping Trends—Procurement Appropriations and Reprogramming

Effects. RC-funded and programmed requirements are routinely identified as bill payers to support fluid Service priorities.[4] The consistent reprioritization of RC investments unintentionally results in early program terminations, restructuring, or delays and extends timelines for fielding current technologies and closing capability gaps.

Examples. The top procurement priority of the Marine Corps Reserve is the KC-130J Super Hercules. The AC has fully fielded the KC-130J, but the 24 RC KC-130J aircraft are not scheduled to be fully fielded until 2026. This extended fielding timeline forces the RC to simultaneously operate the KC-130J and the legacy KC-130T aircraft over the next eight years. These two aircraft have vastly different logistics, maintenance, and aircrew requirements, increasing the outlay of resources to maintain the readiness of the RC KC-130 Squadrons.[5]

In the Navy, the 31 F/18A+ legacy Hornets assigned to Reserve squadrons include some of the oldest in operation, rendering them unable to deploy. Significant maintenance issues limit aircraft availability as these squadrons struggle to meet their operational mission, and system compatibility limitations hamper fulfillment of their strategic reserve role. In addition, the Navy Reserve has been unable to transition from legacy P-3C Orion aircraft to the P-8A Poseidon resulting in the anticipated shutdown of two Reserve patrol squadrons providing Intelligence,

[4] U.S. House of Representatives Comm. on Appropriations, Report to Accompany the Department of Defense Appropriations Bill, 2019 (June 20, 2018), 4.
[5] Statement of LTG Rex C. McMillian, USMCR, Before the Subcomm. on Defense Concerning the Guard and Reserve of the House Appropriations Comm., (April 12, 2018), 12.

Surveillance, and Reconnaissance capacity.[6] The Navy Reserve provides more detail on their unfunded P8-A Poseidon requirement in Appendix C.

Redistribution (Cascading). The Services continue to employ a redistribution model commonly referred to as "cascading" as the primary means for equipping their respective RCs. Cascading is the redistribution of older legacy items into RC units as new equipment is delivered to the AC (see *Figure 1-3*).

Associated Challenges. Cascading has proven to be an unsuitable equipping mechanism, as it does not account for the current pace of technological change and obligates the RCs to retain legacy equipment beyond its intended service life. The trend for labeling both cascaded and existing RC equipment as "modern" continues for items previously considered outdated and identified for divestiture. While this may be justified in some instances, it confuses the fundamental issue of equipment interoperability between the RC and AC while simultaneously masking underlying funding shortfalls.

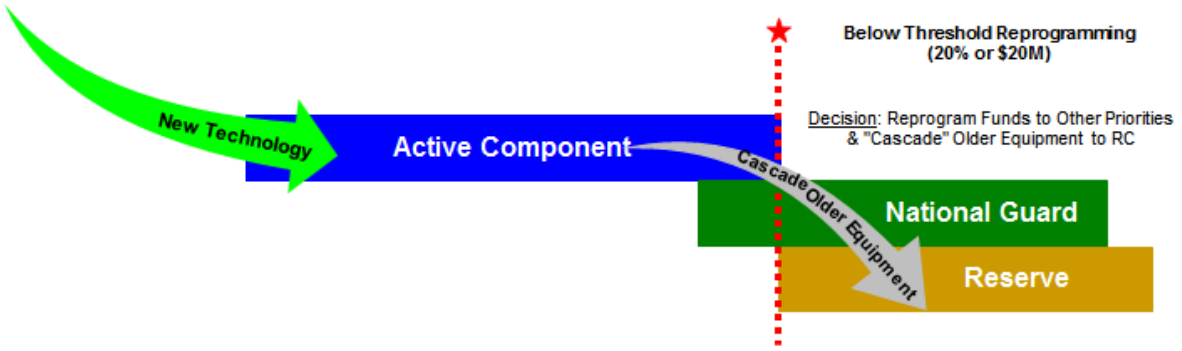

Figure 1-3. Conceptual Depiction of RC Equipping Trends—Redistribution

Effects. Cascading equipment into RC units and retaining aging systems increasingly compromises compatibility and interoperability between AC and RC units. It also delays modernization programs and transfers the rising cost of maintaining aging systems to the RC without a corresponding increase in funding, further constraining operations and maintenance budgets. Additionally, the manner in which this older and less capable equipment is reported in current readiness systems does not account for generational gaps in technology and discounts added logistical challenges. In his testimony before the House Appropriations Committee, Subcommittee on Defense, the Chief, National Guard Bureau (CNGB), General Joseph Lengyel, stated that a model of modernizing the AC and cascading all the old equipment into the RC does not work. When the AC gives all the old equipment to the RC it is often neither maintained nor logistically supported and is less deployable. In his testimony, General Lengyel advocated for modernizing the National Guard in a concurrent and balanced manner.[7]

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[6] Statement of Vice Admiral Luke M. McCollom, Chief, Navy Reserve, Before the Subcommittee on Defense Concerning the Guard and Reserve of the House Appropriations Comm., 115th Cong. (April 12 2018), 6.
[7] Testimony of GEN Joseph Lengyel before the Subcomm. on Defense Concerning the Guard and Reserve of the House Appropriations Comm., 115th Cong, (April 12, 2018).

Example. The Tennessee ARNG's 278th Armored Cavalry Regiment operates M1A1 Abrams Integrated Management Situational Awareness (AIM SA) tanks, which were previously received from the active component. Active-duty Army units are operating the newer M1A2 Systems Enhancement Program (SEP) variant. The National Guard tanks require different parts, and those parts were not readily available as the unit was preparing for a deployment to the National Training Center. Maj. Gen. Max Haston, the Tennessee Adjutant General, noted that the readiness issues are not exclusive to Tennessee, but could be found enterprise wide.[8]

Congressional Provisions. In their oversight role, Congress has continually shown interest in ensuring that programs and equipment critical to the RCs are included in the budget. Congress has noted that many RC requirements go unfunded by the parent Services in the PRESBUD request.[9] Congress has routinely appropriated funds through NGREA above the budget request.

NGREA. Congress uses NGREA to allocate funding for RC equipment distinct from the annual Services' P-1 submission. Originating in 1981, Congress intended NGREA to supplement the Services' budget requests to provide for investments in RC equipment which do not meet the prioritization threshold for inclusion in the PRESBUD submission.

Associated Challenges. Although RC Chiefs have leveraged NGREA to partially fill critical and unfunded requirements, investments are limited by contract availability, and subject to restrictions and congressional approval. While intended to supplement funding for equipment that should be purchased by the parent Service, NGREA instead often serves as an offset to the base budget, granting increased flexibility to reprogram dollars to accelerate higher Service priorities. NGREA is not intended to purchase major platforms, challenging RC efforts to close gaps in technology necessary to achieve interoperability with the AC. As a planning tool, it is unpredictable as it falls outside normal appropriations and is received in the year of execution, limiting the ability to forecast or build long-term investment strategies (see Figure 1-4).

Effects. As a percentage of total RC procurement funding, NGREA has more than doubled from FY 2009 to FY 2019. The Services expect the RCs to use NGREA to fund RC procurements and upgrades that do not meet prioritization thresholds within the Services' centrally managed budget processes.

[8] Kyle Rempfer, "Planes, tanks and helicopters: Equipment shortfalls are hurting the Guard's readiness, leaders say," Military Times (September 6, 2018), Military Times.com

[9] U.S. Senate Comm. On Appropriations, Explanatory Statement for the Department of Defense Appropriations Bill, 2018 (November 21, 2017), 4.

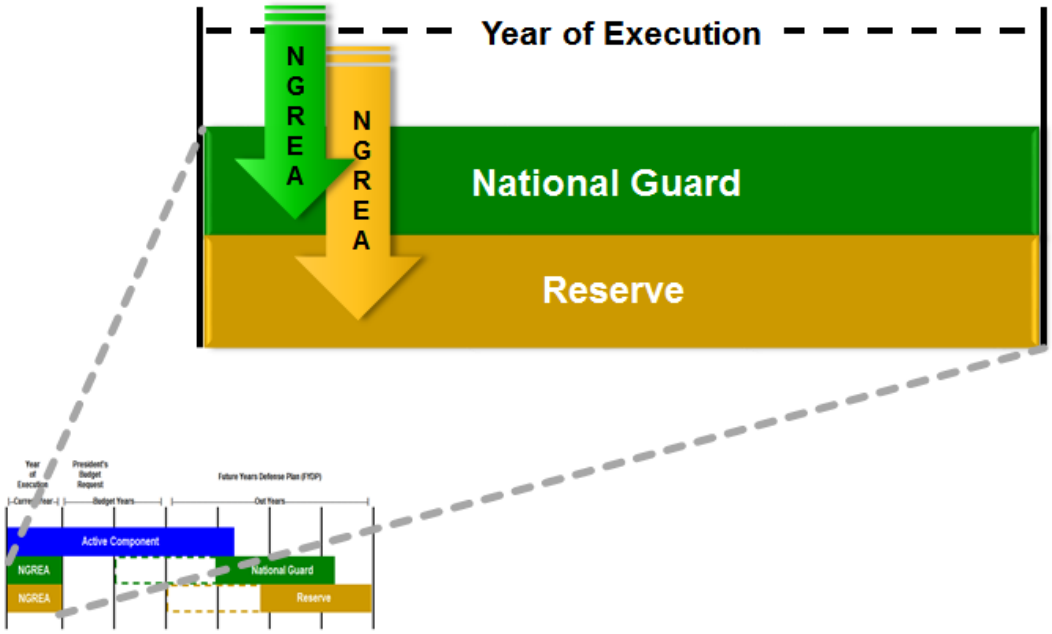

Figure 1-4. Conceptual Depiction of RC Equipping—
Other Congressional Provisions Received in the Year of Execution (NGREA)

Example. Nearly 75 percent of Air Force Reserve and 62 percent of Air National Guard procurement funding is derived from NGREA. Since 2017, NGREA has provided the primary source of funding for key upgrades to the Air Force Reserve's legacy F-16C Block 30 aircraft, which was produced and fielded in the late 1980s (see Table 1-1). NGREA alone is insufficient to completely upgrade 100 percent of the Air Force Reserve's F-16C fleet.

Table 1-1. Air Force Reserve F-16C Upgrades Using NGREA Funding

NGREA
FY 2017 to 2019
($ in thousands)

Program	Budget Request	NGREA
F-16 Actively Electonic Scanned Array (AESA) Radar	—	$54,145
F-16 ALR-69A Digital Radar Warning Receiver	—	$7,100
F-16 AN/ASQ-236 All Weather Targeting Capability	—	$25,000
F-16 Anti-Jam GPS	—	$7,433
F-16 PIDS + Missile Warning System	—	$13,500
F-16 3-Digital Intercom/Spacial Awareness Audio	—	$14,500
F-16 Advanced Data Transfer Equipment (ADTE)	—	$1,928
Total		$123,606

As noted in the FY 2019 NGRER, Appendix C, the Air Force Reserve (AFR) requires investment in upgrades to their F-16C fleet in order to remain globally deployable. The older systems on the AFR aircraft limit their battlespace awareness and full incorporation into a mixed force fight, particularly against 5th generation aircraft. Without more dedicated investment in the

aging F-16C fleet, challenges with interoperability, sustainability, training, and mission suitability will persist.

Directed Appropriations. Each year, Congress includes funding above the PRESBUD request for specific National Guard and Reserve programs that are chronically underfunded.[10] These directed appropriations have historically included funding for major platforms that have not been approved for procurement with NGREA. This level of congressional support results in a degree of concurrent fielding that would not be otherwise achieved.

Associated Challenges. Funding outside of the normal budgeting cycle is unpredictable. While directed appropriations ensure critical platforms can be procured, the receipt of funding in the year of execution is difficult to plan for or forecast.

Effects. Directed appropriations enable the RCs to fill critical shortages, modernize equipment, and improve readiness. They also allow for increased transparency and positive oversight management; closely aligning with the anticipated advantages of transparency reforms through the inclusion of Guard and Reserve specific Budget Line Item Numbers (BLIN) into P-1 documents.

Table 1-2. Directed Appropriations above Budget Request

FY 2017 - FY 2019
Directed Appropriations
($ in thousands)

Program	Directed Appropriations
Army	
UH-60M Blackhawk Helicopters	$373,400
AH-64E Apache Helicopters	$168,000
HMMWV Modernization Program	$300,000
HMMWV Ambulance	$300,000
Air Force	
C-130J Super Hercules	$1,280,000
Total	$2,421,400

Examples. In recent years, congressionally directed appropriations funded the fielding of the newest ground medical evacuation capability to the Army Reserve (AR) and the Army National Guard (ARNG). Since FY 2015, Congress provided $300 million above the PRESBUD request to procure High Mobility Multi-Purpose Wheeled Vehicle (HMMWV) Ambulances to fill significant shortfalls and upgrade an aging fleet. This funding enabled the RCs to improve readiness and provide a medical evacuation capability in support of contingency operations, domestic emergencies, or humanitarian assistance requests.

Table 1-2 provides examples of other critical National Guard platforms funded in recent years with congressionally directed appropriations above the budget request.

Under the existing process for equipping the RC, gaps in transparency and technology persist. Congress recognizes the challenges described above and has made several significant changes to

[10] U.S. Senate Comm. on Appropriations, Explanatory Statement for the Department of Defense Appropriations Bill, 2018 (November 21, 2017), 4.

this report since 2008, requiring additional information and data to draw attention to issues related to RC equipment readiness and interoperability.[11]

II. OSD Assessment of Parity

This year, Congress amended section 10541 of title 10, U.S. Code, to require the Chief of Staff of the Army, and the Chief, National Guard Bureau to annually provide an assessment on the efforts of the Army to achieve parity among the AC, the AR, and the ARNG with respect to equipment and capabilities.[12] For the purpose of completing this assessment, Congress defined parity as having the same variant equipment platforms, and used the Abrams tank as an example, noting that the M1A1 SA analog tank is not equal to the M1A2 SEPv2 digital tank which, in turn does not equal the M1A2 SEPv3. At the request of Congress, OSD is providing a separate assessment here as well as an evaluation of the Army and National Guard Bureau assessment in Appendix D.

Interest in the ability of the Army to field RC forces the same equipment and systems as their AC counterparts is not new. In 2015 and 2016, in response to congressional inquiry, the Congressional Research Service (CRS) published reports comparing RC and AC equipment, including Abrams, Bradleys, and Strykers.[13] These items were important to Congress because they constitute the centerpieces of the Army's Brigade Combat Team structure. This CRS report and a separate Government Accountability Office (GAO) report on the aging Air Force HH-60G Pave Hawk helicopter fleet,[14] inform the design for this assessment. Taking each platform in turn, they compare different model variants within the inventory; show the strategy for modernizing the platforms including a rough production and fielding timeline; and depict the funding that was requested and appropriated to support the modernization strategies. Using a similar evaluation approach, OSD provides information related to efforts of the Army to achieve parity among the AC, ARNG, and AR with respect to the five items specified by Congress (AH-64 Apache, UH-60 Blackhawk, M1 Abrams, M2 Bradley, and Strykers).[15][16]

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[11] Under the Defense Appropriation Act, Congress made the following changes to 10 USC 10541: FY 2015, Exclude Substitutes in Future NGRERs; FY 2017, Improvements/Alternatives to Equipment Transparency Reporting; FY 2017, Modernization Principles to support Transparent Appropriations. Under the National Defense Authorization Act, the following changes were made to 10 U.S.C 10541: FY 1993, Equipment Compatibility between Active and Reserve Forces; FY 2008, CNGB Assessment of Equipment for Emergencies and Disasters; FY 2008 CNGB Statement of Accuracy and Certification of Equipment.

[12] John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115-232, S 111 (2018).

[13] Andrew Feickert, "The Army's M-1 Abrams, M-2/M-3 Bradley, and M-1126 Stryker: Background and Issues for Congress," Congressional Research Service, (October 15, 2015). Andrew Feickert, "The Army's M-1 Abrams, M-2/M-3 Bradley, and M-1126 Stryker: Background and Issues for Congress," Congressional Research Service, (April 5, 2016).

[14] U. S. Government Accountability Office Report to Congressional Committees, Military Readiness, Air Force Plans to Replace Aging Personnel Recovery Helicopter Fleet, GAO-18-605 (August, 2018).

[15] John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. 115-232, S 111 (2018).

[16] Data for inventory comparisons was provided by OUSD(Comptroller) on 19 February 2019. Data was pulled from GCSS-Army using the Total Asset Visibility Report (TAV-R) and includes inventory assigned to operational units. Inventory held by Army depots, Program Managers, RDT&E, Army Prepositioned Stocks (APS), Theater Provided Equipment (TPE), or employed by Training and Doctrine Command (TRADOC) within an institutional training environment was excluded from the analysis.

The Army's FY 2019 budget request continues to balance modernization of current systems, among the AC, ARNG, and AR, by investing in future capabilities to regain and sustain technical overmatch. Within the FY 2019 budget request, the Army increases investments to accelerate mobility and lethality upgrades to Abrams, Bradley, and Stryker combat vehicle fleets and sustains aircraft remanufacturing and new procurement of Apache and Blackhawk helicopters.[17]

Apache and Blackhawk Helicopter

Inventory. Army aviation is designed around the Combat Aviation Brigade (CAB) with Apache and Blackhawk helicopters providing attack and lift capability. The bulk of this capability is distributed across 12 AC CABs and 14 RC CABs and separate aviation brigades (See Table 1-3).

Table 1-3. FY 2019 Apache and Blackhawk Inventory by Component

FY 2019 Apache and Blackhawk Inventory by Component

	Apache (AH-64)		Blackhawk (UH/HH/MH-60)					
	AH-64D	AH-64E	UH-60A	UH-60L	UH-60M	HH-60L	HH-60M	MH-60M
AC	272	186	6	158	311	2	134	53
ARNG	71	—	145	463	183	4	75	—
AR	—	—	—	112	—	—	29	—

Strategy. The end state for Apache helicopters is the pure fleeting of the AC and ARNG with the same variant through remanufacturing and new production of the AH-64E Apache. The long-term strategy for modernizing Blackhawk helicopters includes divestment of UH-60A analog cockpits and conversion to digital aircraft configurations across all Army components. This will be accomplished through a combination of divestiture, recapitalization, cascading, and new production resulting in a total force fleet comprising H-60M and UH-60V models.[18]

FY 2019 Funding Profile[19]

- P-1.[20] The FY 2019 base funding request included $1.213 billion for Apaches (new builds and remanufactured) and $1.241 billion for Blackhawks. The request allocates 48 Apaches and 50 Blackhawks to the AC. The request allocates the production of 9 Blackhawks (UH-60M) and converts 10 aircraft from analog (UH-60A) to digital (UH-60L) for the ARNG.
- P-1R.[21] The P-1R does not identify funding for AH-64E Apaches for the ARNG.[22] The P-1R identifies $139 million to procure 9 Blackhawks (UH-60M) and $81M to convert 10 analog

[17] Army FY 2019 Budget Highlights. https://www.asafm.army.mil/documents/BudgetMaterial/FY2019/Army%20FY%202019%20Budget%20Highlights.pdf.
[18] Various sources including Office of the Secretary of Defense (Comptroller)/CFO Defense Budget Materials, Procurement Programs Reserve Components (P-1R); Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT)), *Weapons Systems Handbook, 2018;* and, Congressional Testimony.
[19] Funding identified through FY 2019 President's Budget Request (P-1/P-1R) and Department of Defense Appropriations for FY 2019.
[20] Procurement Programs (P-1), https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2019/fy2019_p1.pdf.
[21] Reserve Components (P-1R) exhibit is a subset of the Procurement Programs exhibit (P-1). It reflects the Service Actuals/Estimates for those funds which will be used to procure equipment for the National Guard and Reserve.
[22] Under Secretary of Defense (Comptroller), Defense Budget Materials–FY 2019, Procurement Programs Reserve Components (P-1R).

aircraft (UH-60A) to digital (UH-60L). The P-1R does not include Blackhawk funding for the AR.[23]

- FY 2019 Defense Appropriations[24]
  - $753.2 million for AH-64 Apache Block IIIA REMAN and $174.550 million for Block IIIA REMAN (AP-CY) helicopters for the AC.[25]
  - $452.6 million for AH-64 Apache Block IIIB New Build for the Army, includes $168.0 million for 6 aircraft for the ARNG. $58.6 million is included for (AP-CY).
  - $1.1 billion was appropriated to procure 58 UH-60M Blackhawks for the AC, including $156 million for 8 UH-60M aircrafts for the ARNG. $106.1M is included for (AP-CY).
  - $148.1 million was appropriated to support converting analog UH-60As to digital UH-60L Blackhawks for the Army.

Projected Fielding Strategy. Fielding of the Apache AH-64E to AC and ARNG is expected to be completed within 10 years. Fielding of the Blackhawk UH/HH/MH-60M and UH-60V is projected for all Army components within the next 20 years (see Figure 1-5).

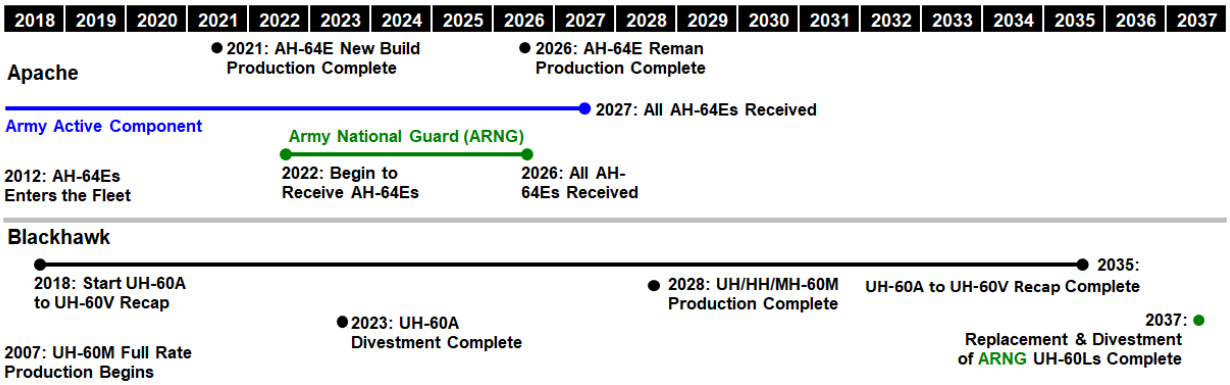


Figure 1-5. FY 2019 Projected Conversions and Upgrades to Apache and Blackhawk Helicopters

Assessment on Efforts to Achieve Parity. Based on the current funding profile and fielding strategy, parity between the AC and ARNG in Apache AH-64E technology is achievable within 10 years. The timeline for incrementally modernizing and upgrading the Blackhawk fleet to a common variant is closer to 20 years. The speed of technology, extended production and fielding timelines, and other unknown variables make it difficult to project the likelihood of achieving parity across Army components.

[23] Under Secretary of Defense (Comptroller), Defense Budget Materials–FY 2019, Procurement Programs Reserve Components (P-1R).
[24] Department of Defense and Labor, Health and Human Services, and Education Appropriations Act, 2019 and Continuing Appropriations Act, 2019, H. Rpt. No. 115-952, 252-254
[25] U.S. Senate Comm. on Appropriations Joint Explanatory Statement of the Committee of Conference (September 13, 2018), 54C.

Abrams and Bradley Tracked Combat Vehicles

Inventory. The armored brigade combat team (ABCT) was designed around combined arms battalions and serves as the Army's primary armored force. The existing inventory includes two variants of both the M1 Abrams and M2 Bradley infantry fighting vehicles (IFVs). There are currently 10 ABCTs in the Active Army and five ABCTs in the ARNG. The AR does not have Abrams or Bradleys.

Table 1-4. FY 2019 M1 Abrams and M2 Bradley Inventory by Component

FY 2019 M1 Abrams & M2 Bradley Inventory by Component

	Abrams		Bradley		
	M1A1 SA	M1A2 SEPv2	M2A2	M2A2 ODS-SA	M2A3
AC	95	783	8	—	1,127
ARNG	275	160	1	375	250

Strategy. Accelerate modernization to improve mobility and lethality through upgrades and modifications to fielded Abrams and Bradley family of tracked combat vehicles. Upgrade M1A1 Abrams and M2A2 Bradley variants bringing the force to M1A2 SEP v3 and M2A4/M7A4 configurations. Apply modifications to enhance survivability; improve reliability, durability, and sustainability; and address network interoperability, obsolescence, and host inbound technologies.[26]

FY 2019 Funding Profile.

- P-1.[27] Army's FY 2019 P-1 request included $1.531 billion to support upgrading 135 M1A1s to the M1A2 SEPv3 configuration and $961.6 million to modify and upgrade the fielded Abrams fleet. The request included $205 million in Overseas Contingency Operations (OCO) funding for upgrading 61 M7A2 OSD-SA to the M2A4/M7A4 configuration and $675.424 to modify and upgrade the family of Bradley Fighting Vehicles.
- P-1R.[28] The FY 2019 P-1R does not identify funding for Abrams or Bradleys' for the ARNG.
- FY 2019 Defense Appropriations[29]. Congress appropriated $1.072 billion for Abrams Upgrades; $925.041M for Abrams Modifications; and $675.424 million for Bradley Modifications.

Projected Fielding Strategy. Production of M1A2C (M1A2 SEP v3) continues with fielding to the first ABCT beginning in FY 2021 followed by cascading of M1A2 SEP v2 to ABCTs

[26] Various sources including Office of the Secretary of Defense (Comptroller)/CFO Defense Budget Materials, Procurement Programs Reserve Components (P-1R); Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology) (ASA(ALT)), *Weapons Systems Handbook, 2018;* and, Congressional Testimony.
[27] Procurement Programs (P-1), https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2019/fy2019_p1.pdf.
[28] Under Secretary of Defense (Comptroller), Defense Budget Materials–FY 2019, Procurement Programs Reserve Components (P-1R).
[29] H.R. Rpt. No. 115-952, 261-263.

equipped with M1A1 AIM SA variants. Divesting of M1A1 AIM SA is projected between FY 2020 and FY 2025. Modifying and upgrading the M2 continues with fielding to the 16th ABCT in FY 2019. Starting in FY 2021, field M2A4 variant to one ABCT per year and begin cascading M2A3 to less modern ABCTs in FY 2023. Divestment of the M2A2 ODS-SA variant is projected to be completed by FY 2025.

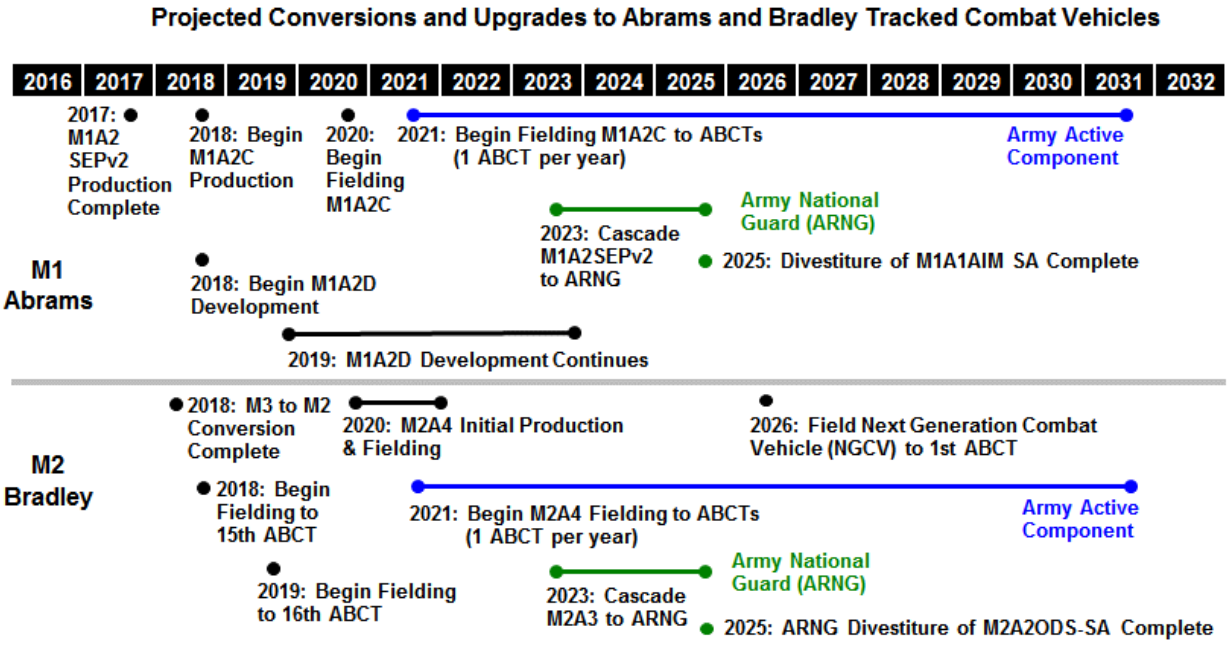


Figure 1-6. Projected Conversions and Upgrades to M1 Abrams and M2 Bradley Tracked Combat Vehicles

Assessment on Efforts to Achieve Parity. Based on the projected funding and fielding strategy, achieving parity in a single variant M1 Abrams and M2 Bradley across AC and ARNG ABCT formations is not probable in the near-to mid-term. However, both AC and ARNG ABCTs will benefit from technological upgrades and modifications. In addition, new variants to the existing inventory are being developed and fielded over the next 10 years. Beginning in FY 2021, at the rate of one ABCT per year, the M1A2C and M2A4 will replace the M1A2 SEPv2 and M2A3 variants making them available to be cascaded as a replacement for the M1A1 SA and M2A2 ODS SA which are scheduled for divestment by 2025.

Stryker Wheeled Armored Combat Vehicle

Inventory. There are currently seven Active Army Stryker Brigade Combat Teams (SBCT) and two ARNG SBCTs. The AR does not have SBCTs, but they have a Chemical, Biological, Radiological, and Nuclear (CBRN) mission that requires Stryker vehicles. Stryker comprises 17 different vehicles (10 Flat-Bottom Hull and 7 Double V-Hull). There are two basic versions—the Infantry Carrier Vehicle (ICV) and the Mobile Gun System (MGS)—and eight different configurations: Reconnaissance Vehicle (RV); Anti-Tank Guided Missile (ATGM); Nuclear, Biological, Chemical, and Radiological Vehicle (NBCRV); Medical Evacuation Vehicle (MEV); Commander's Vehicle (CV); Fire Support Vehicle (FSV); Mortar Carrier Vehicle (MCV); and Engineer Squad Vehicle (ESV).

Table 1-5. FY 2019 Stryker Inventory by Component

FY 2019 Stryker Inventory by Component

	ICV		MGS		CV		FSV		MCV		ATGM		ESV		RV		MEV		NBCRV	
	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH	FBH	DVH
AC	570	599	85	—	127	96	54	40	144	108	46	26	49	36	168	—	119	77	106	—
ARNG	280	—	24	—	61	—	27	—	73	—	19	—	25	—	103	—	54	—	69	—
AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	56	—

FBH: Flat Bottom Hull DVH: Double V-Hull

ATGM: Anti-Tank Guided Missile FSV: Fire Support Vehicle MEV: Medical Evacuation Vehicle NBCRV: Nuclear, Biological, Chemical & Radiological Vehicle
CV: Commander's Vehicle ICV: Infantry Combat Vehicle MGS - Mobile Gun System
ESV: Engineer Squad Vehicle MCV: Mortar Carrier Vehicle RV: Reconnaissance Vehicle

Strategy. Upgrade and pure fleet all Flat-Bottom Hull (FBH) Stryker combat vehicles to Double V-Hull variant (DVHA1) in an effort to improve survivability and mobility[30]. Upgrade lethality and apply fleet-wide modifications to address Command, Control, Communications, Computers, Intelligence (C4I) obsolescence; reliability, capability, performance degradation; safety; and operational-related issues.[31]

FY 2019 Funding Profile.

- P-1.[32] Army's FY 2019 P-1 request included $287.5 million for a new start modification program to support multiple fleet-wide modifications and initiate conversions of DVHA1 Engineering Change Proposal (ECP) upgrades onto Stryker DVH. Request included $21.9 million to upgrade 3 FBH variants to the DVHA1 ECP configuration.
- P-1R.[33] Does not identify funding for upgrading or modifying ARNG's or AR's Strykers.
- FY 2019 Defense Appropriations. Congress appropriated $127.301 million for modifications; and $265.290 million for upgrades to Strykers.[34]

Projected Fielding Strategy. A decision was made in 2019 to pure fleet all FBH Stryker combat vehicles to the DVHA1 variant.[35] With sufficient resources, half of the vehicles in an SBCT would be converted to DVHA1, which is the Army's optimal rate of modernization with three SBCTs completing conversion prior to FY 2024. In FY 2021, the Army will decide the path forward for the first three DVH SBCTs. [36]

[30] H.R. Rpt. No. 115-952, 265.
[31] FY 2019 Program Acquisition Cost by Weapon System, p. 3–8, (OUSD-Comptroller website).
[32] Procurement Programs (P-1).
https://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2019/fy2019_p1.pdf.
[33] Under Secretary of Defense (Comptroller), Defense Budget Materials–FY 2019, Procurement Programs Reserve Components (P-1R).
[34] H.R. Rpt. No. 115-952, 261-263.
[35] Ibid, p. 265.
[36] 2018 Army Weapon Systems Handbook, 114–115.

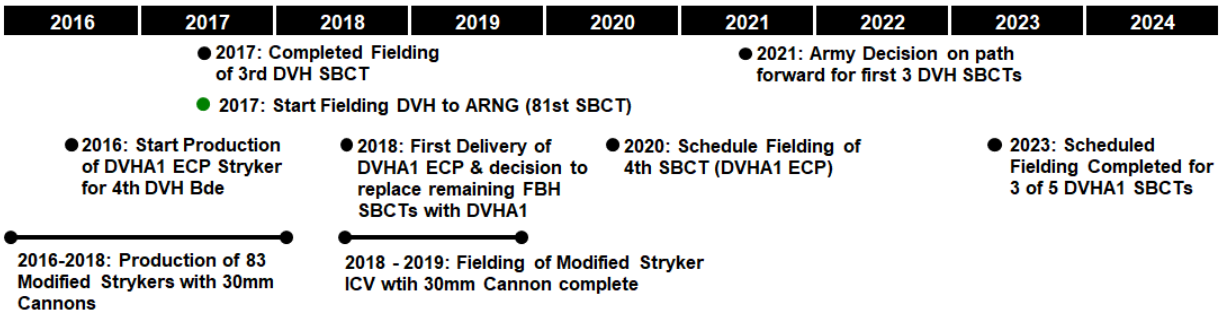


Figure 1-7. Projected Conversions and Upgrades Stryker Armored Wheeled Combat Vehicles

Assessment on Efforts to Achieve Parity. Upgrading the Stryker FBH to the DVHA1 variant continues with completion projected in the near- to mid-term. A decision regarding converting existing DVH variants to DVHA1 is scheduled in 2021. This decision will inform future budget requests and projected production and fielding timelines. At this time, it is difficult to assess the likelihood of achieving parity with the DVHA1 variant across Army components.

Summary. Continued focus on parity among the Army components is both appropriate and essential—especially in the current strategic environment where the pace of technology and race to modernize is creating growing interoperability gaps. This assessment shows there are RC units, to include BCTs and CABs that could deploy with less capable platforms, limiting their ability to integrate with the Joint Force. This could hinder the Combatant Commander's employment of critical capabilities and pose an increased risk to RC units.

Within the Army's equipping policy framework, it is important that, to the extent possible, RC forces have the same equipment and systems as their AC counterparts for training and knowledge development. Training with the same equipment and systems enables more effective and efficient integration and operational use of RC capabilities.[37] In Operations Enduring Freedom and Iraqi Freedom, limited exposure to the equipment and systems of AC counterparts created a cycle of frustration and expectation mismatch between the AC and the RC. When RC forces had the same equipment and were trained on the same systems as their AC counterparts, they were more easily interchangeable.[38]

Today, RC units must be able to communicate and maneuver within the Joint Force. Due to the pace of technological change, concurrent and balanced fielding of new technology is vital. As noted in previous reports, delivering advanced technology to RC units so they are able to communicate and maneuver within a modern joint force is best achieved through a transparent

[37] Institute for Defense Analyses Report for the Reserve Forces Policy Board, "Sharing the Burden and Risk: An Operational Assessment of the Reserve Components in Operation Iraqi Freedom," (January, 2017) vii, and "Sharing the Burden and Risk: An Operational Assessment of the Reserve Components in Afghanistan," (January 23, 2018), vii.
[38] Ibid, vi.

process that ensures visibility of resources from budget formulation, appropriation, and allocation through execution and delivery.

III. Transparency Reform Update

Lack of transparency in the equipping process has led to disparity in funding and investment in the RCs and resulted in the unsatisfactory outcome that the RCs are often reliant upon overused and outdated equipment, subject to a widening capability gap with the AC, and unable to maintain pace with rapid technological change. A solution to meet the requirement for increased funding transparency to procure equipment for the RCs, as identified and supported by Congress, remains elusive.

Over the past decade, senior DoD leaders and members of Congress have recognized the growing RC equipment challenges. Following the publication of the Commission on the National Guard and Reserve (CNGR), Congress noted that DoD was unable to track the majority of funds for RC equipment; that there was no oversight process in place to ensure that funding requested by the Administration or appropriated by Congress for equipment for the RC ever gets to these forces; and that funds were often diverted toward AC units, effectively denying Guard or Reserve units the equipment Congress intended through appropriations.

Members of Congress proposed three potential approaches to resolve these shortcomings: (1) Fund Guard and Reserve equipment entirely through NGREA; (2) Create Guard and Reserve equipment sub-accounts in procurement accounts; or (3) Create separate National Guard & Reserve accounts. At a minimum, they asked that the Department create binding department-wide processes, policies, and directives to ensure transparency and financial accountability by requiring funds intended for the Guard and Reserve to get to the men and women of the Guard and Reserve.[39]

In response, DoD introduced the Equipment Transparency Report (ETR) as an alternative, fourth course of action, meant to serve as an interim solution. However, the ETR proved ineffective in tracking funding requests for equipment for the RCs and lacked the consistency and reliability needed to be definitive. The Senate Committee on Appropriations noted its dissatisfaction with the ETR process and their desire for reform in Senate Report 114-263 accompanying the FY 2017 Defense Appropriations Bill. The report states: “The Committee strongly supports the Department of Defense’s policy of transparency and traceability of procurement funding for the RCs...The Committee supports the practice of including RC funding requests in parent service budgets, but seeks a clearer way to determine the impact of funding on actual equipment procurement.”[40]

Based upon the ineffectiveness of the ETR solution, an independent study from an external entity was completed and was used to inform the DoD’s response to Congress in 2017. The year-long study concluded that desired funding and item inventory transparency could best be achieved by

[39] Patrick Leahy et al., Congressional Letter to The Honorable Robert Gates and Admiral Mike Mullen (September 26, 2008).
[40] U.S. Senate Appropriations Comm., Defense Report, 2017, S. Rpt. No. 114-263 (May 26, 2016), 60.

implementing specific Guard and Reserve Budget Line Item Numbers (BLINs), mutually exclusive from the AC BLINs.[41] The study noted that:

- Until the process starts with specific identification of funding for RC equipment that is binding, the current estimates within the budget (P-1R) will be challenged to provide an auditable trail for tracking equipment appropriation deliveries for Reserve & National Guard units, and
- Creating specific Guard & Reserve Budget Line Item Numbers provides the desired transparency over RC equipment funding, while retaining Service flexibility within the prescribed reprogramming thresholds.

Increased transparency through RC BLIN implementation would also provide advanced audit readiness resulting from the establishment of exhibits that are subject to review and enable oversight and traceability of funds. Additionally, RC BLIN implementation reflects the Department's commitment to improving budget discipline and effective resource management and streamlining requirements and acquisition processes. Increasing transparency supports a long term investment strategy and serves to minimize reprogramming actions between components. Finally, as the Chief, National Guard Bureau notes in his letter of certification in Appendix B, "I do not expect to achieve full transparency and traceability of funding desired by Congress until implementation of specific Reserve Component Budget Line Item Numbers or something similar. Without this level of financial transparency, I am not able to definitively certify, per Title 10, Section 10541, the procurement or receipt of expected items for which funds were appropriated".[42]

DoD reported in 2017 that it would proceed with implementing RC BLINs in future Presidential Budget (PRESBUD) requests (P-1).[43] However, the Department subsequently determined that RC BLINs would not be included in the FY 2020 PRESBUD request, primarily due to administrative and program execution challenges. Changes to long-established budgeting practices are challenging. However, Congress continues to advocate in general for greater transparency in requested funding and compliance with Congressional direction.[44] During a December 2018 meeting of the Secretary of Defense's Reserve Forces Policy Board, the Board Chairman, Arnold Punaro (Maj Gen, ret),[45] noted the core cultural challenge concerning the status quo approach of service programmers, identified the BLIN as the key reform to improve

[41] Office of the Under Secretary of Defense for Personnel and Readiness, Reserve Component Equipment Transparency (August 21, 2015).
[42] GEN Joseph L. Lengyel, Chief, National Guard Bureau, Certification and Statement of Accuracy to Accompany the Annual National Guard and Reserve Equipment Report (Jan 18, 2019).
[43] Office of the Under Secretary of Defense for Personnel and Readiness, Department of Defense Report to Congress on Reserve Component Equipment Transparency (October 2017).
[44] U.S. House of Representatives Appropriations Comm., Report to Accompany the Department of Defense Appropriations Bill, 2019 H. Rpt No. 115-769, (June 20, 2018), 8-9.
[45] Arnold Punaro previously served as the Chairman of the Commission on the National Guard and Reserves which was chartered by Congress to assess the reserve component of the U.S. military and to recommend changes to ensure that the National Guard and other reserve components are organized, trained, equipped, compensated, and supported to best meet the needs of U.S. national security.

equipment transparency, and expressed support for the full implementation and, if needed, the Board's future assistance in this area.[46]

IV. Scope of the Report

The National Guard and Reserve Equipment Report (NGRER), mandated in section 10541 of title 10, U.S.C., is a statutory reporting requirement that reflects congressional interest in ensuring a well-equipped and robust RC capability within the Armed Forces. The NGRER identifies major items of equipment in the RC inventories that are important to the Services, DoD, and Congress, and outlines how that equipment is being acquired and disposed of by the Reserves for the budget year and the two succeeding years. Data on equipment included in the report consist of high-value, mission-essential equipment requirements, critical equipment shortages, Service procurements, supplemental funding for the RC, and items procured with NGREA funding.

The FY 2008 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. This guidance is highlighted in its entirety in Appendix A, 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 and the Chief of the National Guard Bureau on the efforts of the Army to achieve parity among the AC, the AR, and the ARNG with respect to equipment and capabilities. 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 Chief of Staff of the Army or the Chief of the National Guard Bureau.

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 that would be needed to fully fund Reserve capabilities. Detail on potential costs, such as modernization of existing systems is contained, where appropriate, in the chapters of the respective individual RC.

RC inventories include thousands of different types of equipment. The FY 2020 NGRER highlights 774 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.

[46] Official Reserve Forces Policy Board Open Session minutes, (December 12, 2018), https://rfpb.defense.gov/LinkClick.aspx?fileticket=7utY00BxQ28%3d&portalid=67

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 2015 NGRER	FY 2016 NGRER	FY 2017 NGRER	FY 2018 NGRER	FY 2019 NGRER	FY 2020 NGRER
ARNG	320	305	261	243	309	309
AR	231	238	322	390	236	167
USMCR	201	205	183	168	165	157
USNR	40	36	36	30	33	31
ANG	29	29	26	27	26	24
AFR	17	16	17	15	14	14
USCGR	75	69	71	70	71	72
Total	913	898	916	943	854	774

V. 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; however, it does not show capabilities, shortfalls, or compatibility mismatch with the AC due to modernization requirements. For example, it does not include substitute items of equipment in determining shortages of Army RC equipment.

In any fiscal environment, there are never enough resources to fund every requirement. DoD, through its Planning, Programming, Budgeting, and Execution (PPBE) process, has determined that overall risk to the Active and Reserve Components is acceptable and that the allocation of resources between the two components is balanced correctly.

The ARNG and AR 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. Chart 1-2 indicates a $14 billion total shortage cost for the ARNG and $5.5 billion for the AR. 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) reflects a $2.1 billion shortage of its major items; however, the USMCR is equipped to a home station training allowance only. More information on the Marine Corps equipping strategy and the USMCR's use of a training allowance can be found in Chapter 3 of this report.

The Navy Reserve reports a significant increase in the shortage of equipment value since the last report, from $5.8 billion to $7.6 billion. Following the 2018 audit readiness review, the Navy continues to refine processes for accurately calculating equipment shortage values. The increase in shortage values reflects this ongoing process. More information on the Navy's equipping status can be found in Chapter 4 of this report.

Chart 1-2. Beginning FY 2019 Reserve Component Equipment Shortages

Reserve Component	Requirements ($M)	On-hand ($M)	Shortage ($M)	Shortage (% of Reqd $s)
ARNG	115,747.7	101,736.0	14,011.7	12.1%
AR	34,091.0	28,591.0	5,500.0	16.1%
USMCR	9,731.7	7,611.6	2,120.1	21.8%
USNR	10,338.6	2,739.3	7,599.3	73.5%
ANG	55,626.1	50,269.1	5,357.0	9.6%
AFR	24,368.4	23,319.4	1,049	4.3%
USCGR	201.1	194.6	6.5	3.2%
Total	250,104.6	215,267.4	33,837.2	13.9%

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

VI. Equipment Procurement

The RC procurement funding levels for the period FY 2009–FY 2019 are provided in Chart 1-3. The RC portion of the base Service procurement funding is provided in the Service Procurement Programs–Reserve Components (P-1R), a budget exhibit in the annual PRESBUD. Chart 1-3 updates the P-1R values for past fiscal years as each new PRESBUD is released. The P-1R funding for a given fiscal year appears in three successive PRESBUDs, as the original budget request, followed by P-1R updates in two successive PRESBUDs. 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 Congressional appropriation enacted, Supplemental funding, OCO funding, and Service reprogramming.

As shown in Chart 1-3, the total RC P-1R funding has decreased steadily from an FY 2009 peak of $8.2 billion down to $3.4 billion in FY 2019. *Chart 1-4* shows a corresponding downward trend in the percentage of DoD procurement levels for RCs. These trends illustrate the decline in RC new procurement funding which has increased dependency on older legacy systems, increased vulnerability of divestiture, increased operating costs, and will widen the gap of interoperability between the AC and RC.

As noted in last year's report, the FY 2018 P-1R data for the ARNG and AR, as shown in Chart 1-3, is not consistent with prior years' requests for procurement funding. However, adjustments to the Army's requested procurement funding for ARNG and AR were made in the FY 2019 P-1Rs bringing it back into alignment with previous years' requests. The Army data submitted for FY 2018 is representative of challenges in delivering desired levels of transparency.

Chart 1-3. Reserve Component Procurement Funding Requests

FY	Procurement Funding Source	RC Procurement Funding ($M)							
		ARNG	AR	USMCR	USNR	ANG	AFR	Total	Grand Total
2009	President's Budget P-1R (PY)	5,867.9	1,267.0	33.4	203.4	624.4	170.1	8,166.1	
	NGREA	778.6	127.3	62.4	62.4	154.7	62.4	1,247.8	
	Total	**6,646.5**	**1,394.3**	**95.7**	**265.8**	**779.0**	**232.5**		**$9,413.9**
2010	President's Budget P-1R (PY)	3,094.4	1,482.6	40.3	137.0	541.1	155.3	5,450.6	
	NGREA	575.0	85.0	45.0	55.0	135.0	55.0	950.0	
	Total	**3,669.4**	**1,567.6**	**85.3**	**192.0**	**676.1**	**210.3**		**$6,400.6**
2011	President's Budget P-1R (PY)	3,929.4	1,198.0	24.5	135.9	432.3	95.2	5,815.2	
	NGREA	250.0	137.6	69.0	70.0	250.0	68.2	844.8	
	Total	**4,179.4**	**1,335.5**	**93.5**	**205.9**	**682.3**	**163.4**		**$6,660.0**
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)	1,928.9	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	**2,258.9**	**571.2**	**61.4**	**307.4**	**599.0**	**194.6**		**$3,992.6**
2017	President's Budget P-1R (PY)	1,978.2	421.4	36.6	199.8	192.0	50.3	2,878.4	
	NGREA	247.5	105.0	7.5	37.5	247.5	105.0	750.0	
	Total	**2,225.7**	**526.4**	**44.1**	**237.3**	**439.5**	**155.3**		**$3,628.4**
2018	President's Budget P-1R (PY)	675.0	50.4	32.9	221.7	260.5	83.3	1,323.9	
	NGREA	429.0	169.0	13.0	65.0	429.0	195.0	1,300.0	
	Total	**1,104.0**	**219.4**	**45.9**	**286.7**	**689.5**	**278.3**		**$2,623.9**
2019	President's Budget P-1R (CY)	2,159.2	471.8	142.3	331.3	267.7	72.3	3,444.6	
	NGREA	421.0	180.0	13.0	65.0	421.0	200.0	1,300.0	
	Total	**2,580.2**	**651.8**	**155.3**	**396.3**	**688.7**	**272.3**		**$4,744.6**
2020	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: 2020 P-1R and NGREA values were not available as of the date of publication.

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

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	81,184.2	79,860.3	1,323.9	1.6%	Prior-Year
2019	81,256.7	77,812.0	3,444.6	4.2%	Current Year
2020					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: FY 2019 The latest P-1 and P-1R values will not be available until FY 2020 President's Budget is released.
Note 3: P-1 & P-1R values do not include Ammunition appropriations.
Note 4: 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 5: FY 2020 P-1 numbers were not available as of the date of publication

VII. 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 remains an essential component of the Army's operational force, providing critical warfighting capabilities to combatant commanders while remaining responsive to missions in the homeland. In accordance with the established priorities of the Director, ARNG, the ARNG is

aggressively seeking to increase organizational efficiencies, maintain cost-effectiveness, and improve overall readiness by modernizing combat platforms and updating mission command systems. These priorities will ensure that the ARNG optimizes its resources to remain aligned with the National Defense Strategy and the Army's strategic objectives.

For this coming year, the ARNG will focus on better posturing itself towards the Army's Sustainable Readiness Strategy by increasing interoperability and modernization of equipment. This strategy requires a significant decrease in the use of authorized substitution and legacy equipment for the RCs, and timely distribution of cascaded equipment for training and deployment. The ARNG will likewise advocate for balance in modernization of combat support and combat service support units.

This year, the ARNG changed its top 10 modernization shortfalls to prioritize enabler and logistical systems. This breaks from previous submissions where shortages in critical weapon systems and aviation platforms were identified. The ARNG is instead focusing on shortfalls that are at increased risk because they fall outside of the Army's "Big Six" modernization priorities. They are maintaining visibility of critical weapon systems using the Army's joint assessment of parity.

The ARNG's top focus areas are:

- Modernize ARNG Mission Command Systems to remain interoperable with the Army.
- Modernize remaining ARNG Armor Brigade Combat Teams (ABCT).
- Modernize the ARNG's Tactical Wheeled Vehicle Fleet to the Joint Light Tactical Vehicle beginning in FY 2021.

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

B. Army Reserve (AR)

Although the AR remains a relevant and skilled force, modernization and lifecycle sustainment of critical equipment within its formations is imperative to achieve readiness goals. The AR must be equipped with platforms and systems capable of global deployment and seamless integration in support of the full range of combat scenarios. However, the enabler-centric AR is not well positioned to compete for resources based on fiscal realities and the current Army prioritization model.

Quickly generating and deploying units requires the most capable and modern equipment—to close interoperability gaps in areas such as battlefield communications and mission command systems—ensuring that units are ready to deploy rapidly without extended post mobilization train-up. The AR requires predictable and sustained funding for modernization to ensure timely delivery of equipment necessary to build and retain readiness.

The top AR focus areas are:

- Pursue predictable funding and balanced resource prioritization to mitigate future readiness risk and enhance the ability to win in contested environments.

- Emphasize concurrent modernization of critical enabler capabilities required for global power projection in support of Multi-Domain Operations.
- Influence policy decisions to provide more accurate methods of assessing equipment modernization and readiness posture.

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

C. United States Marine Corps Reserve (USMCR)

The demand for unique capabilities within the Marine Corps Reserve has increased, requiring more RC activations of units and ad hoc formations to produce enabling capabilities across the range of military operations. For the most part, USMCR units remain highly interoperable with their AC counterparts due to the Marine Corps' Total Force approach to equipment fielding and management. However, the fiscal instability of the past several years and the continued reality of ongoing budgetary uncertainty disrupts USMCR ability to program long-term activities, and challenges its efforts to improve current and future readiness.

The Marine Corps Reserve's top focus areas are:

- Transition to KC-130J Super Hercules. The RC currently maintains a mixed fleet of KC-130J and legacy KC-130T aircraft that have completely different logistics, maintenance and aircrew requirements.
- Aviation and Ground Equipment Modernization. Delayed fielding increases equipment compatibility challenges and results in a requirement to concurrently maintain both new and legacy equipment which has become increasingly costly and negatively affects overall readiness.
- Constrained Resource Environment. Limited resources will impact current operations, equipment reset, and the ability to maintain warfighting readiness while modernizing the force.
- Shortage of Mobile Integrated Remains Collection System. The Marine Corps' sole mortuary affairs capability resides in the RC, which currently lacks this mission essential equipment.

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

D. United States Navy Reserve (USNR)

As competition accelerates in the maritime domain, the U.S. Navy must rapidly create a larger and more powerful fleet that incorporates cutting edge technologies and new operational concepts. As part of the Navy Total Force, Reserve sailors provide operational capabilities, strategic depth, and the capacity to surge quickly. USNR equipment requires compatibility with the AC to support applicable Navy assigned missions. Achieving equipment compatibility with the AC is critical to the USNR in ensuring the RC has the ability to train to the same standards as and seamlessly operate with AC counterparts.

The USNR's primary equipment concerns are replacing the P-3C aircraft (35 years old) and F/A-18A+ aircraft (31 years old) that operate at a significantly higher cost, produce lower readiness

rates, and provide lesser capability than their projected replacement platforms. The Coastal Riverine Force requires modernization and outfitting as well. To ensure the USNR can support AC requirements, dedicated funding is needed for future investments in USNR hardware. The USNR provides more detail on their P8-A requirement in Appendix C.

The top USNR focus areas are:

- Aircraft recapitalization (P-8A, F/A-18E, KC-130J, & F-5N/F)
- Modernizing key capabilities (Coastal Riverine Force, Patrol Boat fleet)
- Keeping pace with capabilities that increase lethality: Unmanned Aerial Systems.

A more detailed discussion of these challenges can be found in Chapter 4, Section II of this report.

E. Air National Guard (ANG)

Because the ANG operates and maintains the oldest aircraft in the Air Force inventory, it faces significant challenges to increasing aircraft availability. Over the past several years, the Air Force has been forced to make difficult decisions to meet operational needs, deciding to invest heavily in fleet recapitalization and compliance initiatives, leaving certain critical fleet modernization requirements "below the line."

While some improvements were made to the equipment status of the ANG in FY 2019, there are still fundamental challenges to the sustainment, modernization, and recapitalization of the ANG's legacy equipment. Specifically, ANG requires investments in battle space awareness systems in order to be interoperable with AC missions. This is critical for ensuring Air Guardsmen properly train to a single standard required to seamlessly integrate the ANG with the Total Force. Support equipment for sustaining ANG aircraft remains a challenge as well.

The top equipping challenges for ANG are:

- Budget instability—root cause of readiness erosion. Stable, predictable funding is paramount to rebuild readiness & lethality.
- C-17: Sustainment, maintenance, and supply support to extend service life.
- E-8C: JSTARS: Corrosion and changes to depot maintenance plan.
- F-16: Service life extension to keep fleet flying until 2046.

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

F. Air Force Reserve (AFR)

In line with the National Defense Strategy, the AFR continues to focus on readiness through theater specific training sets and weapon system modernization that addresses increased peer competition in today and tomorrow's battle space. The AFR has prioritized 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. Modernization of aircraft and support equipment is required to maintain or reverse degraded capabilities, adapt to evolving threats, improve safety and efficiency, and overcome materiel age.

The top equipment focus areas for Air Force Reserve are:

- Aircraft Modernization to maintain readiness and compatibility to support combatant commanders.
- Diminishing Manufacturing Sources negatively impact the necessary repair capability to maintain readiness.
- Vehicles and Support Equipment have been chronically underfunded to accommodate other modernization efforts.
- Training Simulators must keep pace with aircraft modernization and force structure changes to produce mission ready aircrew.
- Fall Protection to ensure compliance with safety standards and practices.

A more detailed discussion of these challenges can be found in Chapter 5, Section II of this report.

G. United States Coast Guard Reserve (USCGR)

The USCGR 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.

Adequate funding to support equipment procurement and maintenance as well as necessary training to operate and maintain the equipment is critical to sustaining an effective operational reserve. The USCG continues to aggressively pursue replacement of its aging boat platforms, weapons, and other equipment. Once procured and fielded, the USCGR will require additional training to become proficient on the new equipment and maintain operational readiness. Last year's modest increase in the Reserve Training Appropriation base funding did not fully address current resource level restrictions. This negatively impacted the Coast Guard's ability to access, train, and retain the necessary USCGR workforce.

Therefore, the top USCGR focus areas are:

- Obtaining sufficient training capacity to ensure proficiency on updated platforms.
- Maximizing availability of operational platforms for USCGR training.

More information about the USCGR equipping challenges can be found in Chapter 6, Section II of this report.

Chapter 2
United States Army Reserve Components

"The Army (will) accelerate upgrades to critical capabilities, managing current risk while we innovate and prototype with a goal to begin fielding the next generation of combat vehicles, aerial platforms, and weapons systems by 2028.

- Secretary of the Army Mark Esper, April 2018 Posture Hearing

I. Army Overview

A. Army Planning

Consistent with the 2017 National Security Strategy (NSS), the National Defense Strategy (NDS) synchronizes DoD's response to a more complex security environment than any experienced in recent memory. To deter war and protect the security of our nation, we must provide a combat-credible Joint Force prepared to win.

The 2018 NDS has three lines of effort:

- Restoring readiness and building a more lethal force;
- Strengthening existing alliances, while building new partnerships abroad; and
- Reforming and modernizing our Department for greater affordability, accountability, and performance.

As directed in the NDS, the Army made urgent and significant changes to ensure the Army provides credible and capable strategic land power to combatant commanders to prevent conflict, shape the environment, and win decisively.

The NDS makes it clear that the greatest threat to U.S. prosperity and security is the reemergence of long-term, strategic competition by Russia and China. Today, every domain is contested—air, land, sea, space, and cyberspace. We face an ever more lethal and disruptive battlefield, combined across domains, and conducted at increasing speed and with increasing reach. Further, new commercial technologies are changing society and ultimately, the character of war. The NDS requires DoD to remain the preeminent military power in the world, deterring and countering rogue regimes, consolidating our gains in Iraq and Afghanistan, and moving to a more resource-sustainable approach.

B. The Army Equipping Guidance

Over the past decade, the Army made resourcing choices to support ongoing wide area security operations against less-capable adversaries by deferring modernization upgrades to current weapon systems. Concurrently, Russia and China developed capabilities that have placed the U.S. Army's competitive advantage at risk. Over the next five years the Army will focus modernization, science and technology, and research and development efforts on six modernization priorities to develop next generation capabilities and reestablish overmatch in

relationship to near-peer adversaries. By 2028, the Army will reestablish overmatch and begin fielding next generation capabilities that will enable it to win a large scale combined arms maneuver campaign against a near peer adversary.

1. Long-Range Precision Fires

The U.S. lacks overmatch to peer competitors in both range and lethality. The Army must modernize its surface-to-surface fires capabilities, increasing both range and lethality, to win against a peer competitor.

Way Ahead: The Army is modernizing its precision fires capability at the echelon level to close the range and lethality gaps. These efforts include the Strategic Long Range Cannon at the strategic level, the Precision Strike Missile at the operational level, and Extended Range Cannon Artillery at the tactical level.

2. Next Generation Combat Vehicle (NGCV)

Due to the lack of operational overmatch and future operating environment dominance, the Army requires increased soldier protection, mobility, and lethality. These vehicles must also be able to adapt to new technology and operate manned or unmanned.

Way Ahead: The Army will develop two variants of the Next Generation Combat Vehicle: a robotic combat vehicle and a manned fighting vehicle. Collaborative design efforts are underway for initial concept vehicles.

Army Modernization Priorities

1. Long-Range Precision Fires
2. Next Generation Combat Vehicle
3. Future Vertical Lift
4. Army Network
5. Air and Missile Defense
6. Soldier Lethality

3. Future Vertical Lift (FVL)

The current aviation fleet is reaching design limits and lacks the ability to achieve and sustain overmatch against asymmetric threats in a near peer, Anti-Access and Area Denial (A2AD) environment. Future Vertical Lift (FVL) enhances vertical lift dominance through next-generation assets (Utility/Attack variants) that provide increased reach, protection, lethality, agility, and mission flexibility. Teamed with future unmanned systems, FVL will have the interoperability to support Joint Operations to seize, retain, and exploit the initiative in an A2AD environment.

Way Ahead: Future Vertical Lift has initiated two efforts to develop both Utility and Attack versions through competitive prototyping that will rapidly develop and field the next-generation of rotary wing aircraft.

4. Army Network

The Army's current network is too complex, fragile, and insufficiently mobile.

The Army requires a tactical network that fulfills operational warfighter requirements of survivability, effectiveness, interoperability, and suitability for an expeditionary Army in all environments, against all enemies.

Way Ahead: The Army embarked on a halt, fix, pivot network strategy, and applied an adapt and buy modernization approach to that strategy. This strategy requires significant institutional and cultural changes in how the Army modernizes the network to capitalize on private-sector advancements and innovation.

5. Air and Missile Defense (AMD)

Army Air and Missile Defense (AMD) has a critical role across all phases of conflict. Army AMD can no longer assuredly defeat A2AD capabilities, support the Joint Warfighting Force, defend vital assets in the National Capital Region, and defeat missile attacks against U.S. Air superiority. The Army faces an aerial threat that continues to improve in capability, countermeasures, and tactics. Pacific Command, Central command, and European Command face an advanced Tactical Ballistic Missile (TBM) and Cruise Missile (CM) threat and Russia has demonstrated reductions in the sensor-to-shooter timeline using tactical unmanned aerial systems (UAS) and long-range rockets/artillery. The Army has identified extremely high risk gaps in both capability and capacity to protect our maneuvering formations and ability to provide critical asset defense against TBMs and CMs.

Way Ahead: The Army is re-establishing a Maneuver Short Range Air Defense (M-SHORAD) capability to counter threat UAS and other near-peer threats, as well as fielding an interim Indirect Fire Protection Capability to protect critical fixed and semi-fixed assets. The Army is investing in proven capabilities to improve fielded systems, while accelerating development of next-generation capability for our sensors, shooters, and mission command.

6. Soldier Lethality

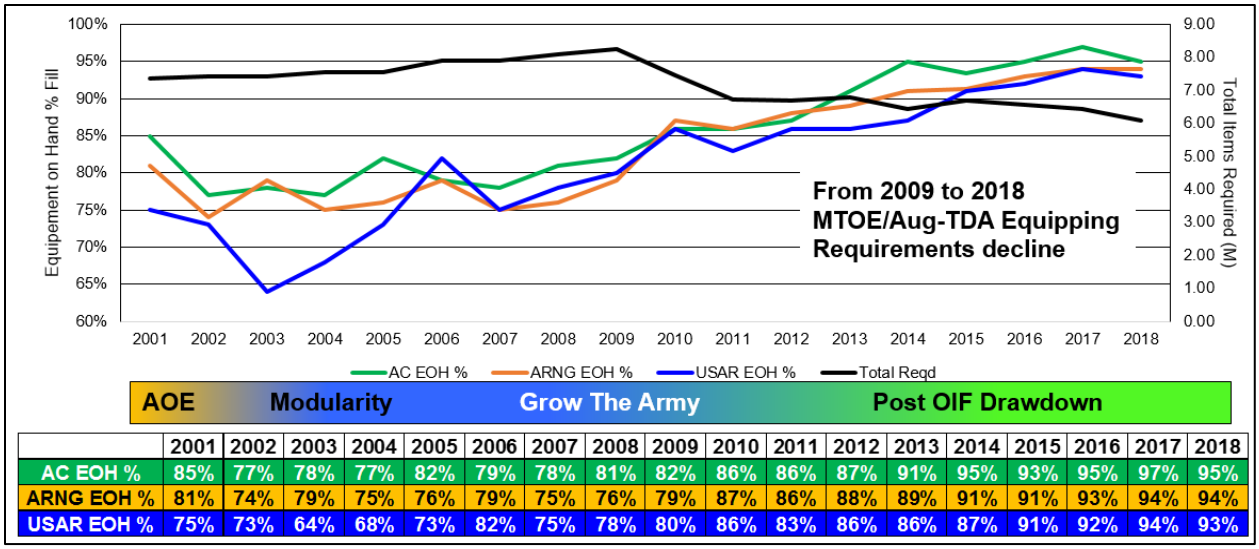
Close combat, which produces 90 percent of U.S. casualties in conflict, is the key factor to winning wars. Unfortunately, Army programs have been historically under-resourced in this vitally important area. In essence, the Army has made it a “fair fight” at the squad level and this must change.

Way Ahead: The Army will invest in capability to establish overmatch against current and future adversaries through improved lethality, mobility, protection, and situational awareness at the squad level. The Army will provide Soldiers with the ability to fight, rehearse, and train in all conditions with two variants of Next Generation Squad Weapons: Rifle and Automatic Rifle with Integrated Visual Augmentation System/Heads-Up Display (IVAS/HUD).

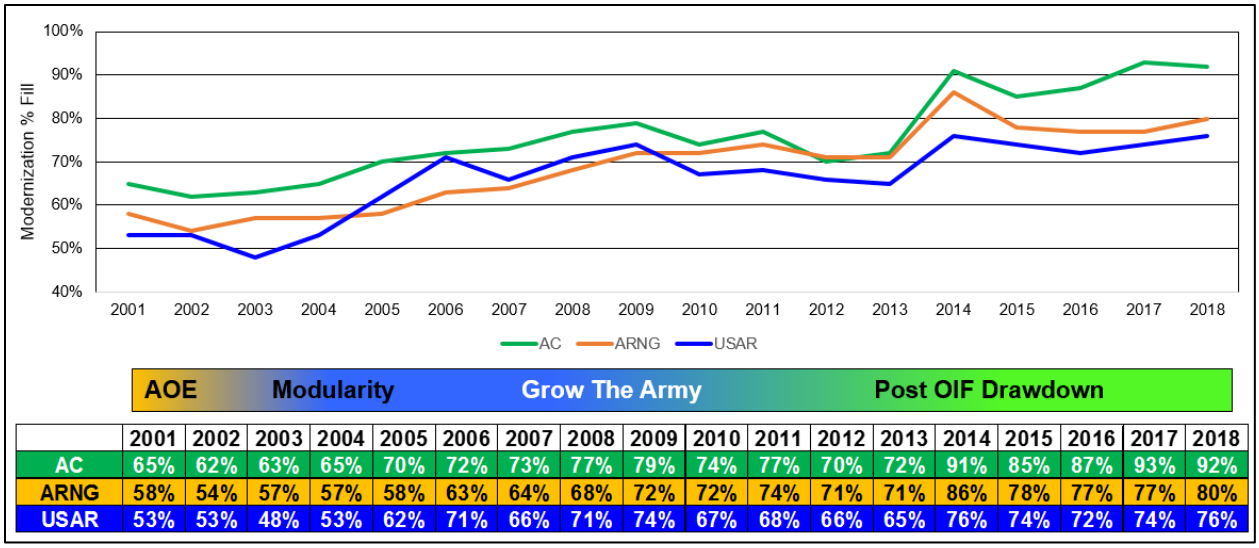
C. The Army’s Plan to Fill Mobilization Shortages in the Reserve Components (RCs)

1. Equipping Units for Their Missions

The Army is committed to equipping and modernizing the Total Force. Since 2001, the Army has focused equipping and modernization efforts on the deploying units to ensure Soldiers committed to combat have the best equipment in the inventory—regardless of component. As a result, Equipment on Hand (EOH) and modernization levels of all three components have increased during this period of time. The Army will continue to equip and modernize the Total Army in accordance with established priorities and available funding.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AC EOH %	85%	77%	78%	77%	82%	79%	78%	81%	82%	86%	86%	87%	91%	95%	93%	95%	97%	95%
ARNG EOH %	81%	74%	79%	75%	76%	79%	75%	76%	79%	87%	86%	88%	89%	91%	91%	93%	94%	94%
USAR EOH %	75%	73%	64%	68%	73%	82%	75%	78%	80%	86%	83%	86%	86%	87%	91%	92%	94%	93%



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AC	65%	62%	63%	65%	70%	72%	73%	77%	79%	74%	77%	70%	72%	91%	85%	87%	93%	92%
ARNG	58%	54%	57%	57%	58%	63%	64%	68%	72%	72%	74%	71%	71%	86%	78%	77%	77%	80%
USAR	53%	53%	48%	53%	62%	71%	66%	71%	74%	67%	68%	66%	65%	76%	74%	72%	74%	76%

2. Increasing Readiness by Redistributing Equipment

The Army fills shortages within the RC as part of the total force fielding plan. Current and planned operations/missions are prioritized to determine fielding priorities across the Army, in line with the NDS. The plan encompasses three elements: 1) Mission-focused equipment, 2) Readiness Redistribution, and 3) Efficiency.

a. Mission-Focused Equipment

The Sustainable Readiness Model (SRM) helps synchronize resources to meet known demands optimally and minimize the risk to contingency demand across all components of the Army. The SRM permits the identification of feasible readiness objectives for each unit/capability type in the Army in a component agnostic way and prioritizes units to build decisive action readiness, while avoiding readiness cliffs. The SRM enables the identification of feasible readiness objectives for each unit/capability type in the Army and prioritizes units to build decisive action readiness.

The SRM operationalizes the RC by leveraging the unique capabilities of the Army National Guard (ARNG) and U.S. Army Reserve (USAR) forces to support early- and mid-deploying forces as identified in War Plans. The SRM provides Army leaders with an analytic basis to make resource decisions that enhance the readiness of selected RC units while creating greater operational depth across the Total Army.

b. Readiness Redistribution

A deliberate equipment redistribution review process ensures the right equipment is in the right place. The Army is committed to meeting DoD Instruction 1225.06 (Equipping the Reserve Forces) requirements to pay back ARNG and USAR equipment transferred to the AC with new production or fully modernized 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 expensive older systems, excess EOH, and non-standard equipment when appropriate, while ensuring equipment distribution and redistribution is accomplished at the lowest levels.

D. Initiatives Affecting RC Equipment

In the best of all worlds, every unit across the Total Army would have complete sets of the most modern equipment in its formations. Resource limitations, however, require the Army to prioritize the equipping and modernization of 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 fieldings to deploying units; prepositioned sets of equipment modernization; and the establishment of new, high priority units in the force.

The Army fully supports transparency initiatives on equipping and modernization the ARNG and USAR. The Equipment Transparency Report specifies component-level funding and procurement quantities on key Congressional budget exhibits and the delivery of funded equipment. Collecting the data remains a manual process for the Army because current databases were not designed to link funding with equipment delivery. The DoD Item Unique Identification (IUID) effort enables visibility of this process. In addition, the Army has established a general officer-level forum to implement the laws, regulations, and policies regarding IUID.

The Army has undertaken efforts to increase accuracy of quantity start-points for reporting. This provides a clearer indication of deviations from the planned delivery of items to the RCs. The Army will provide discrete traceability through financial management systems that restore component-level visibility once delivery occurs and funds are disbursed. These improvements will support the Chief, National Guard Bureau certification, per Title 10, Section 10541, of receipt and non-receipt of expected items.

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

The Army's plan to achieve compatibility between the RA and the RC makes use of the SRM. The SRM seeks to operationalize the RC fully by leveraging the unique capabilities of ARNG and USAR forces to support early- and mid-deploying forces as identified in our War Plans by appropriately improving RC readiness as a key element of the Army's operational depth.

Furthermore, within the SRM construct, units associated with the Mission phase, or aligned for the Contingency phase are not required to maintain the exact same modernization levels, but must be compatible—regardless of the component. Army Modernization priorities will account for units' interoperability. Cross-Component unit compatibility requires sufficient EOH to enable both targeted training readiness levels and integrated training exercises. Key to this is the synchronization of fielding plans and training programs.

F. Army Component Equipment Modernization.

The competitive advantage that the United States has long enjoyed is eroding. We are being challenged in every domain of warfare: land, maritime, air, cyber, and space, and the challenges are growing in scale and complexity. Our recent focus on fighting wars of insurgency and terrorism allowed our adversaries to make improvements on their modernization efforts and erode the advantages we have enjoyed since World War II. Our Army must regain its overmatch and competitive advantage against emerging threats, competitors, and adversaries. We have worked hard in recent years to increase our readiness and strengthen our formations, and now must modernize our capabilities to increase our 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, as systems transition from Developmental to Legacy to obsolete, it becomes misleading to think older equipment is less modern based on the equipment's age. In many cases equipment age has very little to do with the level of modernization or capability to meet mission requirements. The Army's approach to meet requirements with a mix of new procurement and legacy (but capable) items allows for good stewardship of taxpayer dollars, while meeting the combatant commander need to provide the best equipped, most lethal units to meet the mission. This strategy provides for more modern replacements and substitute equipment (equal to or more modern than the item it is replacing) to maintain unit readiness and technological overmatch over extended procurement periods.

II. Army National Guard Overview

"We have worked hard in recent years to increase our readiness and strengthen our formations and now must modernize our capabilities to increase our lethality…"

- GEN Mark A. Milley, 39th Chief of Staff, Army, Modernization Priorities for the United States Army

A. Current Status of the Army National Guard

1. General Overview

The Army National Guard (ARNG), comprised of 343,500 Soldiers, is a Federal Reserve of the Army and is a Domestic Response Force to the governors of the 50 states, 4 territories, and to the District of Columbia. The ARNG makes up nearly 40 percent of the Army's Operating Forces and 22 percent of the Army's Generating Forces.

The ARNG remains an essential component of the Army's operational force, providing critical warfighting capabilities to combatant commanders (CCDRs) while remaining responsive to missions in the homeland. As of January 2019, 21,657 Soldiers were mobilized around the world in support of Title 10 operations, including 15,289 personnel from 46 states and territories engaged in Theater Cooperation missions. In FY 2018, the ARNG executed over 1.3 million duty days in support of domestic operations that included hurricane response and southwest border national security missions.

Top ARNG Focus Areas

- Modernize ARNG Mission Command Systems to remain interoperable with the Army
- Modernize remaining ARNG Armored Brigade Combat Teams (ABCT)
- Modernize the ARNG's Tactical Wheeled Vehicle Fleet to the Joint Light Tactical Vehicle beginning in FY 2021
- Execute 4 Brigade Combat Teams (BCT) per year through Combat Training Center (CTC) rotations
- Enhance ARNG readiness through participation in the Army's Associated Unit Pilot program
- Enhance readiness for select units to meet Army, Combatant Command, and State requirements

a. ARNG Modernization Overview

The ARNG will continue to make significant investments in training, maintenance, and modernization to sustain warfighting readiness while setting conditions for the future Operational Environment.

The ARNG is working with Headquarters Department of the Army (HQDA) to synchronize equipment cross leveling and new equipment distribution plans to ensure the ARNG is a cohesive fighting force that can operate seamlessly with the joint force in the battlespace. The Army Futures Command was created to unify the Army modernization enterprise and to develop and support delivery of new warfighting capabilities faster and more cost effectively. This reform began with the establishment of eight Cross Functional Teams (CFTs) that are aligned with the Army's six modernization priorities.

These priorities address the Army's most pressing operational needs in order to ensure overmatch against a potential near-peer competitor with the goal of developing next generation platforms and capabilities fundamental to winning on the offense with superior lethality and bold maneuver.

The Army's six prioritized areas that are key to operationalizing Multi-Domain Operations are Long Range Precision Fires (LRPF), Next Generation Combat Vehicles (NGCV), Future Vertical Lift (FVL), Army Network, Air and Missile Defense (AMD), and Soldier Lethality.

Eight CFTs were created to address the six modernization priorities: LRPF, FVL, Assured Positioning, Navigation and Timing, NGCV, Army Network, AMD, Soldier Lethality, and Synthetic Training Environment.

The ARNG has partnered with the Army to help CFTs developing and fielding new capabilities across the modernization priorities to increase lethality and overmatch and assist the rest of the Joint Force in all domains. This includes deepening interoperability with our allies and partners (domestic and international).

b. Status of the ARNG as an Operational Force

> *"We need to ensure that we have the resources to continue to train, man and equip, and that the modernization is at a level that allows us to be interoperable with the Army."*
> ***- LTG Timothy J. Kadavy, 20th Director, Army National Guard***

The ARNG serves as an integral part of the Army's operational force. As such, it supports CCDRs by providing expertly trained and ready forces for ongoing rotational assignments and dynamic global contingencies. When considering the operational environment of the future and the growing capabilities of our near-peer competitors, we expect a continued reliance on the ARNG. To meet enhanced readiness requirements and reduce post-mobilization timelines, the ARNG is implementing initiatives to ensure interoperability with its various stakeholders while enabling responsive support to state governors for domestic missions.

The ARNG will implement these initiatives with the Army's Sustainable Readiness Model (SRM) and focus its policies and prioritization of resources on high demand units with additional training days and Combat Training Center (CTC) rotations. In this manner, the ARNG will be able to deliver two Armored or Stryker Brigades and up to four Attack Reconnaissance Battalions (ARB) within 30 to 90 days of notification and sustain two Infantry Brigade Combat Teams (IBCTs), two Division Headquarters, and Army Early Response Forces at enhanced readiness postures. Simultaneously, the ARNG will execute support as part of the Army's Associated Unit Pilot (AUP) program and integrate ARNG units with Active Component (AC) units to enhance Total Army capabilities.

In accordance with the established priorities of the Director ARNG (DARNG), we are aggressively seeking to increase organizational efficiencies, maintain cost-effectiveness, and improve overall readiness by modernizing combat platforms and updating mission command systems. These priorities will ensure that the ARNG optimizes its resources to remain aligned with the National Defense Strategy and the Army's strategic objectives. Proactively focusing on

the development of an agile, resilient, and lethal force will allow the ARNG to remain adaptive to the dynamic changes in the global strategic environment.

c. Defense Support of Civil Authorities and State Missions

ARNG support of civil authorities encompasses myriad mission sets ranging from asset protection, 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 2018 Defense Support of Civil Authorities and State Missions

Event Type	Event Amount	Event Type	Event Amount
Key asset protection	2	Search and rescue	40
Law enforcement support	2	Water support	8
Winter storm response	12	Severe weather	4
Flood response	12	Tornado Response	2
Special event	5	Joint Operations Center support	1
Wild Fire	19	Southwest border support	3
Hurricane response	4	Counterdrug support	54
Medical support	2	Civil Support Team (WMD-CST) days on mission	4,552

In order to be ready and available to respond to domestic emergencies, it is key the ARNG's Essential-10 capabilities receive the most modern and available equipment. The Essential-10 consist of Aviation/Airlift, Command and Control (C2), Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives (CBRNE), Engineering, Medical, Communications, Transportation, Security, Logistics and Maintenance. The National Guard CBRN Response Enterprise (CRE) force elements consist of the Weapons of Mass Destruction Civil Support Teams (WMD-CSTs), Homeland Response Forces (HRF), and CBRNE Enhanced Response Force Packages (CERFPs).

2. Status of Equipment

a. Equipment On-Hand

The ARNG in coordination with HQDA G-8, produces the biannual Army National Guard Equipment On-hand (EOH) Dashboard, which provides an overall percentage of EOH against Modified Tables of Equipment (MTOE) requirements nationally and for each of the 50 states, 4 territories, and the District of Columbia. This overall percentage is further broken down into equipment available for domestic operations (deployed and not available to the governors) and Critical Dual-Use (CDU) equipment. CDU equipment is further divided into ARNG Essential-10 domestic capabilities requirements. The CDU list is updated annually by ARNG and HQDA G3/5/7 to reflect changes to MTOE and force structure. DARNG annually submits recommendations for the CDU list to HQDA G3/5/7 for vetting and approval.

As of August 2018, the ARNG's authorized EOH (including authorized substitutions and legacy equipment) was 95 percent for MTOE and 95 percent for MTOE CDU equipment. Equipment available to the governors is currently 90 percent for MTOE and 88 percent for MTOE CDU.

Table 2-2 provides an overview of the most significant ARNG CDU shortages in accordance with Essential-10 requirements to equip domestic missions.

Table 2-2. Army National Guard Top CDU Shortages

Capability	Equipment Type	Shortage Value
Transportation	Semitrailer Flatbed: Container Transporter 34T	$85.94M
Logistics	Load Handling System (LHS) 2000 Gal Tank (HIPPO)	$1.57M
Transportation	Semitrailer Low Bed 25T 4 Wheel	$88.33M
Engineering	Tractor Full Tracked High Speed: (DEUCE)	$16.45M

b. Average Age of Major Items of Equipment

The average age of ARNG equipment at the beginning of FY 2019 is provided in *Table 2 Average Age of Equipment*. An increase in manufacturing and recapitalization programs through FY 2018 alleviated the historical problems associated with aging equipment. In the past, the ARNG received much of its equipment through cascading actions from the AC. This equipment was often already at or near the end of its service life. Programmed replacements and rebuilding efforts could not keep up with the operational requirements. The ARNG has units aligned with the AC in the Army's Associated Unit Pilot (AUP) Program with equipment requiring modernization. The 840th Engineer Company (Texas ARNG) associated with the 36th Engineer Brigade (AC) stationed at Fort Hood Texas, is currently equipped with the Launcher M60 Series Tank Chassis Transporting: 40 and 60ft Bridge (Armored Vehicle Launched Bridge) that is past the Economic Useful Life (EUL). The Texas ARNG is scheduled to modernize to the Joint Assault Bridge between FY 2021 and FY 2022 based on the current Army fielding schedule. *Table 2-3* below provides a list of the top ARNG legacy equipment items that have surpassed their economic usefulness and exceeded their expected lifecycle.

Table 2-3. Army National Guard Top Legacy Equipment

Nomenclature	Line Item Number	Average Age (years)	Economic Useful Life (years)
Semitrailer Low Bed: 25 Ton 4-Wheel W/E	S70517	50	20–25
Semitrailer Low-bed: 40-ton 6-Wheel	S70594	28	20–25
Launch M60 Series Tank Chassis Trnsptg:40 & 60 ft. Bridge	L43664	34	25–30
Recovery Vehicle Full Tracked: Medium M88A1	R50681	41	25–30
Tractor Full Tracked Low Speed: DSL Med DBP w/Winch	W76816	39	15–40

c. Modernization for the ARNG

As an operational reserve, the ARNG must maintain a concurrent and balanced modernization strategy to meet mission requirements for AC/RC compatibility and interoperability. The Army presently defines "modern" as any item reflected as a minimum mission essential wartime requirement (MMEWR) on a unit's MTOE (authorization document) to include authorized substitutions and legacy equipment. Additionally, current Army policy documents modernization

of equipment primarily based on funding and procurement projections per fiscal year to reflect the Army's modernization strategy. The ARNG currently reports in the aggregate 78 percent EOH without any authorized substitutions or legacy equipment to fill requirements. By FY 2022, ARNG is projected to report 84 percent EOH against the documented modernization strategy. In the same year, ARNG is projected to reach 91percent EOH with authorized substitutions and legacy equipment in the Army's 20 Major Capability areas.

Within the 20 Major Capabilities Portfolios from FY 2020–FY 2022, the ARNG will increase the use of authorized substitutions and legacy equipment rather than the most modern equipment on their MTOE as follows: 15 percent EOH in Combat Mobility (mine detecting sets and various engineering equipment); 18 percent in Soldier Systems (night vision goggles and machine gun tripods); 32 percent in Force Protection (chemical/biological masks and agent detectors); and most significantly 35 percent in Soldier Weapons (M4 rifles, M9 pistols, and grenade launchers). While ARNG modernization in major combat platforms (Apaches, Blackhawks, Bradleys, etc.) continues to improve, our over reliance on legacy systems for combat support and combat service support items (trailers, trucks, and field logistics equipment etc.) impedes modernization of the total ARNG force. See *Table 2-4* for current ARNG modernization shortfalls.

Table 2-4. Army National Guard FY 2019 MTOE Modernization Shortages

ARNG FY19 MTOE/AUG-TDA	Requirement ($B)	EOH ($B)	Shortage ($B)	Shortage (% of Req'd)
Pure Fleet "Modern" Equipment	$108.7	$96.85	$12.01	11.03%
Authorized Subs/Legacy Equipment	$108.87	$102.90	$5.97	5.48%
ARNG FY19 MTOE/AUG-TDA	**Requirement**	**EOH**	**Shortage**	**Shortage (% of Req'd)**
Pure Fleet "Modern" Equipment	2,590,360	2,015,351	575,009	22.20%
Authorized Subs/Legacy Equipment	2,590,360	2,496,087	94,273	3.64%

d. Maintenance

The age and condition of ARNG maintenance facilities continues to be a concern with regard to operational use and safety to unit personnel. For FY 2018, 230 of the 797 ARNG maintenance facilities (28.9 percent) are over 50 years old, and do not meet current design requirements to execute the maintenance mission. Changes in unit force structure, e.g. K Series Modified Table of Organization and Equipment (MTOE) increased the size of an (ABCT) by approximately 300 pieces of equipment. Additionally as the ARNG receives more modern and technologically complex equipment, the requirements for specialized tools, lift, overhead, and floor space increases. The current total Military Construction funding for the ARNG's long-range construction planning for surface equipment maintenance facilities is estimated at $2.8 billion based on input from the Planning Resource for Infrastructure Development and Evaluation (PRIDE) database. Field-level maintenance is the first line of effort in sustaining ARNG equipment readiness. Much of this equipment supports a dual-status mission for homeland

security/defense and emergency operation missions. ARNG maintenance facilities must keep pace with an increased size and technologically advanced fleet of combat and support equipment.

The ARNG Surface Depot Maintenance Program is a strategic and increasingly an operational component that supports ARNG fleet readiness. The ARNG Depot Program, via depot overhaul and rebuild programs, sustains EOH readiness and enables critical combat and support equipment to reach its projected expected lifecycle. ARNG depot sustainment activities maintain fleet reliability and reduce the excessive demand placed on Operating Tempo (OPTEMPO) spending. ARNG Depot Maintenance Program funding for FY 2018 was $133 million. This is 87.0 percent of the ARNG's critical requirement of $151 million for FY 2018. Funding levels that support ARNG critical requirements for FY 2019–FY 2023 are critical to sustaining the ARNG fleet as increased OPTEMPO places greater demand on ARNG equipment availability. Any decreases in program funding will reduce operational readiness levels and would likely impact the availability of combat and combat support systems to ARNG units conducting training, overseas deployments and domestic operations.

In FY 2018, the ARNG Field Level Home Station Reset Program restored 104,022 pieces of critical unit equipment returning from overseas deployments and contingency operations. Maintenance performed on this equipment returned it to Technical Manual 10/20 standards within 365 days of returning to home station. The ARNG Field Level Home Station Reset Program is vital to restoring necessary combat power to support Sustainable Readiness Model timelines.

HQDA mandates that 100 percent of deployed equipment must be identified for induction into the Sustainment Maintenance program prior to continental United States redeployment. The timely return of ARNG equipment is critical to maintaining a high state of unit readiness in order to fulfill ARNG mission requirements.

e. Overall Equipment Readiness

The number one priority of the Army Chief of Staff is unit readiness. Transfers and withdrawals of equipment are crucial to improving unit readiness. Utilizing equipment already available across the Army and its RCs maximizes this effort and preserves funding and resources, as shown in *Table 5 Projected Equipment Transfer/Withdrawal Quantities*. This process also allows the National Guard to work with outside agencies such as the Army's Sustainment Command (ASC) and the Defense Logistics Agency (DLA) to reduce excess equipment and strengthen unit readiness.

The ARNG continues to work with the Army to ensure deploying units receive the most modern equipment, and that unit utilization planning is prioritized in accordance with the ARNG Operational Demand Based Resourcing Priorities for equipping modernization guidance. The Army places a high level of importance on deploying unit compatibility, interoperability, and modernization commensurate to AC units.

f. Other Equipment Specific Concerns

As a result of increased MTOE unit equipment prioritizations and readiness demand requirements, ARNG Generating Force (GF)—Table of Distribution and Allowances (TDA)

units—receive less equipment and sometimes less modern equipment that decreasing institutional support and hindering overall ARNG training readiness efforts. In addition, cross leveling equipment to support priority units further impacts resources available to GF units. Equipping ARNG GF units will continue to be a challenge to overall readiness.

The ARNG continues to support both ARNG and AC units with equipment transfers executed under DoDI 1225.06, *Equipping the Reserve Forces*. Equipment transfer requirements are identified, validated, prepared, and tracked to completion. Continuous vigilance and coordination between the ARNG, HQDA, Army Materiel Command (AMC), and other offices ensures ARNG unit readiness is preserved. The ARNG anticipates requests approved in accordance with DoDI 1225.06 to support future and various urgent warfighter needs between and within components. Continued diligence by all stakeholders will preserve and maintain ARNG readiness and EOH levels, better positioning the Guard to fulfill both its homeland response and federal mission.

DoDI 1225.06 transfers may be identified by HQDA, ARNG, or other agencies. The ARNG staff coordinates with the HQDA staff to best meet the needs of the CCDRs and the Army. DoDI 1225.06 procedures provide greater transparency and traceability controls over RC equipment transfers. This includes transfers from one component to another, transfers within a component, diversions of planned distributions, and equipment inducted into maintenance facilities. Additionally, the instruction provides enhanced reporting requirements to provide enhanced transparency and accountability for ARNG equipment. The Army has also published supplementary instructions that clearly outline and define the Army's internal processes and procedures that will transfer to the ARNG and U.S. Army Reserve (USAR) equipment in accordance with DoDI 1225.06. The ARNG, in conjunction with the Army Sustainment Command and HQDA G8, continues to monitor replacement requirements established since 2003 and approved by the Secretary of Defense. Via regularly scheduled integrated product team meetings consisting of members from HQDA, Army Materiel Command, ARNG, and USAR, all theater equipment transfers and replacement plans are properly annotated and tracked. The ARNG continues to work closely with the Army Sustainment Command and HQDA to ensure equipment is returned and future transfers are properly executed.

B. Changes from FY 2019 NGRER

Table 1 Consolidated Major Item Inventory and Requirements and *Table 7 Major Item of Equipment Substitution List* provide equipment inventories, shortfalls, and modernization requirements for the ARNG at the end of FY 2022.

The most notable changes from FY 2019 to FY 2022 National Guard and Reserve Equipment Report are the increase in ARNG EOH for authorized substitutions and legacy equipment. The Army mandates use of on-hand authorized substitute equipment to fill the capability gap when there are delays in modernization (in-lieu-of legacy equipment at the discretion of the unit commander). This increase in authorized substitutions and legacy equipment, although "capable," steadily widens the modernization gap between the AC and the National Guard.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements provides the projected FY 2020–FY 2022 major equipment inventories and requirements.

2. Anticipated New Equipment Procurements

The first fielding of the Joint Light Tactical Vehicle (JLTV) is currently scheduled for ARNG 19th and 20th Special Forces Groups in FY 2021. The ARNG has 402 JLTVs programmed for delivery between FY 2021 and FY 2022 at a total cost of $159 million. The remaining quantities are to be incrementally fielded pending the conclusion of the TRADOC/FORSCOM IBCT study to revalidate the JLTV Basis of Issue Plan (BOIP) for the IBCT.

The ARNG completed modernization of the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Ambulances, and TOW/ITAS Weapons Carriers with the FY 2017 congressional appropriation. Continued modernization of the HMMWV Cargo fleet is ongoing with FY 2017 and FY 2018 congressional specified appropriations. This will enable the ARNG to sustain the LTV fleet in the interim as a critical C2 transportation asset during domestic operations. In FY 2017, Congress appropriated $100 million for ARNG HMMWV modernization and $40 million for ARNG HMMWV ambulances. The FY 2018 Congressional Line Add appropriated $100 million for ARNG HMMWV modernization and $120 million for ARNG HMMWV Ambulances, but stipulates that funding for safety upgrades can only be used for new production or when a vehicle is reset to a zero mile/zero hour condition.

The Army validated the Operation Needs Statement submitted by U.S. Army Alaska for a replacement for the Small Utility Support Vehicle (SUSV). A Capability Production Document has been developed with the recommendation that the SUSV be replaced by a Joint All-Weather/All-Terrain Support Vehicle (JAASV). This vehicle will provide transportation for a combat-loaded squad element conducting emergency medical evacuation, C2 capability, and general cargo transportation. The vehicle will operate on-and-off road under a wide range of impassable terrain and in extreme cold weather conditions in support of year-round training for Homeland Defense (HD), Defense Support of Civil Authorities (DSCA), and Search and Rescue mission sets. The ARNG validated the JAASV requirement of 92 vehicles to support ARNG units in Alaska, Colorado, Minnesota, and Vermont. The SUSV is not a program of record, not currently funded, and will become obsolete by FY 2022.

The chemical, biological, radiological, and nuclear (CBRN) program portfolio is currently scheduled for FY 2020 and beyond, with multiple first units equipped. These CBRN programs will cover multiple next generation capabilities from under the Theater Validation Integrated System (CALS), including the Man Portable Radiological Detection System for the ARNG.

The ARNG will receive 24 of the upgraded AH-64E model Apaches between FY 2022–FY 2026. This fielding plan was approved by the Vice Chief of Staff of the Army in July 2018, and increases the ARNG current on-hand inventory from 72 to 96 Apaches.

3. Anticipated Transfers/Withdrawals from ARNG Inventory

Table 2 lists projected transfers and withdrawals of equipment. Currently the only programmed transfer of equipment to the ARNG from the AC in the Army Sustainment Command's Logistics Information Warehouse-Distribution Support Tool (LIW-DST) is the Shop Equipment Contact Maintenance (SECM) Package. The SECM is used to repair battle-damaged vehicles on the battlefield, at equipment maintenance sites, and at unit maintenance collection points (UMCPs). The Army is scheduled to transfer 2 SECMs to the ARNG against a shortage of 184 systems.

The ARNG will transfer 62,400 pieces of equipment to fill shortages in the ARNG, Active Army, USAR, or Army Prepositioned Stocks. The ARNG will turn-in 67,500 pieces of equipment that have been declared obsolete, displaced by newer equipment, or are no longer required in the force. As was the case over the past year, the main systems to be displaced by newer equipment include rifles and protective masks. Soldier System equipment is the most affected as the ARNG transitions from the M40/M42 protective mask to the M50/M51 and from the M16A2/A4 and M4 rifles to the M4A1 Carbine. Older generation heavy and medium trucks that have been declared obsolete are being withdrawn. It is critical that as the ARNG removes older equipment from its inventory, new and modern equipment replaces it at the same pace.

4. Equipment Shortages and Modernization Shortfalls at the End of FY 2022

Table 8 Significant Major Items Shortages provides equipment inventories, shortfalls, and modernization requirements for the ARNG at the end of FY 2022. The primary equipment items of concern are in the Maneuver, Soldier, Mission Command, Engineer and Mobility, Combat Service Support Sustainment, and Combat Service Support Transportation Portfolios. Table 8 excludes modernization challenges discussed in the 2019 National Defense Authorization Act Parity Assessment and other ARNG equipping shortfalls where sourcing solutions were identified.

a. Aviation Portfolio

The ARNG owns 43 percent of the total Army Aviation structure consisting of rotary-wing, fixed-wing, Unmanned Aircraft Systems (UAS) platforms, and enablers for Aviation Ground Support Equipment (AGSE), and Air Traffic Control Systems (ATS).

Investment in New Procurement and Modernization: The Army has a plan in place to modernize ARNG Attack Reconnaissance Battalions (ARBs) with 24 AH-64E Apache aircraft from FY 2022 through FY 2026. Currently, ARNG ARBs are configured with 18 Apaches. The ARNG Blackhawk fleet continues to modernize with 535 M-Model aircraft over the next several years and beginning in FY 2022 will begin to field the 372 V-Model aircraft. This will allow the ARNG to be a totally digital fleet. Currently, the ARNG has 48 percent of their M-Model aircraft on-hand, while the AC and RC have 90 percent on-hand. The ARNG will only meet the 535 M-Model acquisition objective if production and fielding continues through FY 2027. Any cut to production will delay the ARNG modernization even further than the current timeline.

The ARNG Cargo Helicopter fleet is completely modernized with 165 CH-47F aircraft. The ARNG's Light Utility Helicopter of 212 UH-72A Lakota will require lifecycle modifications to sustain the fleet through the next decade. The ARNG is programmed to complete 31 RQ-7B Shadow Unmanned Aircraft System upgrades to Version 2 including remaining launchers by Q4

FY 2019. The Small Unmanned Aircraft System (SUAS) Raven is equipped at 70 percent, but the high breakage rate and shortage of 238 systems leaves multiple units unable to adequately train to meet readiness requirements; see *Table 2-5* for current ARNG modernization shortfalls.

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

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
Small Unmanned Aircraft System, Raven B	S83835	$168K	$147M

b. Maneuver Portfolio

The Maneuver Portfolio encompasses families of combat systems including Abrams tanks, Bradley and Stryker Fighting Vehicles, and HERCULES Recovery Vehicles. The ARNG Armored Brigade Combat Teams (ABCTs) and Stryker Brigade Combat Teams (SBCTs) have 100 percent of the portfolio's vehicles using authorized substitutions and legacy equipment.

Investment in New Procurement and Modernization: The ARNG will modernize in accordance with The Army Chief of Staff's "Least to Most" Modernization Strategy. This strategy raises the modernization level of the ARNG's three least modern ABCTs (1/34th ABCT–MN/OH, 30th ABCT–NC/SC/WV, and the 278th ABCT–TN/PN) by cascading more modern Abrams and Bradleys from the AC. Cascades are not expected before FY 2022, after modernization of Army Prepositioned Stocks (APS) 2.2 and the 15th ABCT (AC). The 116th ABCT (ID/MT/OR/NV) is the only mixed fleet ABCT in the Army Enterprise—it uses both modernized and non-modernized Abrams tanks. A mixed fleet poses additional parts, storage, logistics, supply chain, and interoperability challenges that hamper an ABCT's ability to maintain and deploy. The shortfall of 14 Abrams tanks listed in *Table 2-6* below reflects one company in the 116th ABCT (NV) that is authorized to use M1A2 SEPv2 Abrams tanks, but is currently fielding M1A1 AIM-SAs as an authorized substitution.

In addition to tracked combat vehicles, HQDA DCS, G-3/5/7 Current and Future Warfighting Capabilities Division increased funding to pure fleet both Active Component and ARNG ABCTs with modernized M88A2 HERCULES recovery vehicles. The M88A2 allows single vehicle recovery of the 70 ton SEPv2 Abrams tank. There is no funding in the current POM 20-24 for the eleven M88A2s needed to complete the ARNG ABCT pure fleet (1/34th ABCT–MN/OH, 30th ABCT–NC/SC/WV, and the 116th ABCT–ID/OR/MT/NV). The shortfall listed in *Table 2-6* reflects the shortage of 11 M88A2s.

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

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
Tank Combat Full Tracked 120MM M1A2	T13305	$7.6M	$106.4M
Recovery Vehicle Full Tracked: Heavy M88A2	R50885	$2.8M	$30.8M

c. Soldier Portfolio

The Soldier Portfolio administers oversight of individual/crew-served weapons, thermal weapons sights, night vision, Improved Target Acquisition Systems (ITAS), Common Remotely Operated Weapon Stations (CROWS), 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 Multi-role Anti-armor Anti-personnel Weapon System (MAAWS) is a critical capability for infantry soldiers against armor, hardened targets, and soft targets in the counter defilade action. The ARNG has a shortfall of 620 MAAWS. Only 7 percent of the requirement is filled, which partially fielded two IBCTs plus the 19th and 20th Special Forces Groups. Both SBCTs and the remaining 18 IBCTs are without this capability. There is no plan in place to fill this capability gap through the FYDP (Table 2-7). The ARNG will receive enough new MAAWS for one BCT per year, plus cascaded MAAWS from the AC. The cascaded older variant cannot be used in a counter defilade capability because it lacks fire control. The AC will replace legacy MAAWS plus the new requirement of 11 additional MAAWS per BCT. The cascaded MAAWS will go through depot maintenance, from which only two-thirds are expected to clear and cascade to the Guard. The time to restore a MAAWS at the depot is unknown. The cascaded MAAWS will not meet the increased total Guard requirement.

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

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
84mm Recoilless Rifle M3, MAAWS	R45101	$16.6K	$10.3M

d. Air and Missile Defense (AMD) Portfolio

The ARNG provides 78 percent of the Army's Short Range Air Defense (SHORAD) structure. The 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 systems. 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 Deterrent Initiative exercises and discontinued the Counter Rocket Artillery Mortar missions in the Middle East. ARNG Air Defense Units continue to support training at the National Training Center, Joint Readiness Training Center and multiple Test exercises. Challenges are in the Air Defense Airspace Management systems at the ARNG BCT with retention and software upgrades and training.

Investment in New Procurement and Modernization: The Army's current modernization pathway of AMD is unclear at this time and continues to move to the right. The Army has activated two AC Avenger Battalions (based on emerging requirements) with modernized AMD Planning and Control Systems (AMDPCSs). This action impacts the seven ARNG Avenger battalions' modernization efforts by extending the sustainment of the Avenger/AMDPCS out to FY 2036. The modernization of the current Avenger and C2 (AMDPCS) systems are scheduled to begin with fielding the Indirect Fire Protections Capability (IFPC) and the Integrated Battle

Command System in FY 2026. Modification and upgrades are planned for some major line items in Avenger and AMDPCS to maintain operation readiness.

Table 2-8. Army National Guard Top Air and Missile Defense Modernization Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total PUC Cost
Air Defense Airspace Management Battery CP	C17156	$1,642,106.00	$34.5M
Air Defense Airspace Management Air Battle Management Operations Center (ABMOC)	C77942	$1,683,867.00	$13.5M
Forward Area Air Defense Command & Control (FAAD C2) V5.5C-2.0	C91673	$2,000,000.00	$80M

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 Brigades (EAB) force structure. The Indirect Fires portfolio consists of Field Artillery platforms, munitions, sensors, and C2 systems. Major items include: M119A3 and M777A2 Howitzers, Paladins, Multiple Launch Rocket System (MLRS), High Mobility Artillery Rocket System (HIMARS), Q-50 Lightweight Counter Mortar Radar, Q-53 Counter Fire Target Acquisition Radar, and Joint Effects Targeting System (JETS).

Investment in New Procurement and Modernization: Indirect Fires Platforms and Towed Artillery Systems (M777A2 and M119A3) will achieve modernization to meet the ARNG's 2020 strategy. However, MLRS will not meet modernization goals. The 1-147th (SD) and 1-142nd (AK) battalions of MLRS launchers (M270A1) are scheduled to be modernized in FY 2024 and FY 2025 (see *Table 2-9*). Due to initial low rate production, the ARNG will not start fielding the JETS hand-held precision targeting device until the end of FY 2020, with completion currently scheduled for late FY 2024 (see *Table 2-9*). The portfolio will also support the EAB re-design growth of the Paladin from the 3 Batteries of 4 Guns (3x4) to the 3 Batteries with 6 Guns (3x6) design formation by FY 2022. The ARNG began fielding Q53 Counter Fire Target Acquisition Radar in FY 2016 to replace the legacy Q36 and Q37 Firefinder Radars. The ARNG will not have Q53 Radar fielding completed until FY2022. Lastly, the portfolio's next major investment is the Paladin Integrated Management (PIM M109A7), to be fielded to one ARNG ABCT per year beginning in FY 2020.

Table 2-9. Army National Guard Top Indirect Fires Modernization Shortfalls

Nomenclature	LIN	# Items Short	Total Shortage Cost
Multiple Launch Rocket System: (MLRS) M270A2	Z05503	32ea $5,353,000	$171,296,000
Joints Effects Targeting Systems (JETS)	Z05227	1,283ea $280,000	$359,240,000

f. Mission Command Portfolio

The Mission Command portfolio supports the Chief of Staff of the Army's number four priority "An Army Network with hardware, software, and infrastructure—sufficiently mobile and

expeditionary—that can fight cohesively in any environment where the electromagnetic spectrum is denied or degraded."[1] The current modernization efforts are aligned with the Network Modernization Strategy focusing on those activities and capabilities that improve network mobility and survivability, support joint/coalition interoperability, simplify the tactical network to reduce complexity, and address electronic warfare/cyber vulnerabilities. The Program Executive Office, Command, Control, Communications-Tactical (PEO C3T) and Program Managers execute applicable New Equipment Fielding/Training events for select units based on the HQDA G-3/5/7 FY Prioritization List.

Investment in New Procurement and Modernization: Resource prioritization for Mission Command systems is targeting brigade-sized units for modernization and fielding. These fielding and modernization efforts for the tactical Army Network must be expedited to ensure the ARNG is prepared to operate in the current cyber threat environment. The Transportable Tactical Command Communications (T2C2) system and the Commercial Coalition Equipment (CCE) are a critical dual use capability that will not be fully fielded to the National Guard. The T2C2 system is a lighter, more expeditionary capability that will replace the aging satellite dish in the Army's inventory. The T2C2 system, which provides global communications in austere environments, can be rapidly deployed in support of domestic operations. The 48th IBCT (GA) was fielded in FY 2018. The 2/34 IBCT (IA), 155 ABCT (MS), 30ABCT (NC), 422ESB (NV) and 58th E-MIB (MD) are currently scheduled for fielding in FY 2019. By FY 2023 the ARNG will be fielded at 68 percent for T2C2 (L) and 66 percent for T2C2 (H), no other fielding is projected for the ARNG in POM 20-24 resulting in an interoperability challenge for 32 percent of the force. Similarly, the CCE, which was designed to enable voice and data collaboration between U.S. and coalition forces, was used in Puerto Rico after Hurricane Maria to provide interoperable communications between the military forces and state and local responders.

Table 2-10 reflects the shortfalls of 42 T2C2 (L) (32 percent) and 51 T2C2 (H) (34 percent), these shortfalls reflect the CSA's deep dive cuts for POM 2020-2024. In order to modernize equitably, the Unit Set Fielding strategy and HQDA G-3 Fielding Plan process should be reexamined.

Table 2-10. Army National Guard Top Mission Command Modernization Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
*Transportable Tactical Command (L)	T05071	$209K	$27.325M
*Transportable Tactical Command (H)	T05073	$369K	$43.523M

* Critical Dual Use Equipment

g. Force Protection Portfolio

The Force Protection Portfolio consists of warfighter protection systems including Nuclear, Biological, Chemical Reconnaissance Vehicles (NBCRVs) and the Smart Ray Vision explosive ordnance X-ray capability. The ARNG ABCTs and IBCTs have 85 percent of the portfolio's

[1] United States Army Chief of Staff, General Mark A. Milley and Acting Secretary of the Army Ryan D. McCarthy, *Modernization Priorities for the United States Army*, October 3, 2017.

authorized NBCRVs. ARNG explosive ordnance units have 23 percent of the required X-ray capability.

Investment in New Procurement and Modernization: The ARNG will modernize the NBCRV fleet by FY 2022 in accordance with Army Chief of Staff's Modernization Strategy. In FY 2022, full readiness will not be achieved due to the non-pure fleet of NBCRVs within ARNG ABCTs (1/34th ABCT–MN, 30th ABCT–NC, and the 278th ABCT–TN). The shortfall is 3 systems per BCT with an overall shortfall of 12 systems in the ARNG. The lethality in the maneuver formation is degraded without the required reconnaissance assets.

In addition to the NBCRVs in the portfolio, the lifecycle support for radiographic imaging systems for explosive ordnance units ended on May 4, 2018 due to significant safety risk to users. HQDA partially funded a commercial off-the-shelf (COTS) alternate solution below unit requirements. States with explosive ordnance units are unable to achieve full readiness without radiographic imaging capability to support homeland defense and BCT augmented support. Alabama, Arizona, California, Florida, Georgia, Massachusetts, New York, Nevada, North Carolina, and West Virginia are affected.

Table 2-11. Army National Guard Top NBC Force Protection Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
Nuclear Biological Reconnaissance Vehicle	N96543	$4.5M	$54.M
Smart Ray Vision	FG353P	$0.62M	$8.2M

h. Intelligence and Electronic Warfare (IEW) Portfolio

The IEW Portfolio consists of systems to support military intelligence and electronic warfare activities. The ARNG has an equipment shortfall for the Prophet Spiral 1 as shown in *Table 2-12*. The Prophet is a 24-hour, all weather, near real time, ground-based tactical signals intelligence/electronic warfare system capable of searching and monitoring the radio frequency spectrum, performing signal intercept, direction finding, and reporting operationally relevant information. The Prophet is organic to the brigade combat team (BCT), Stryker BCT (SBCT), and Expeditionary Military Intelligence brigades (EMIB). The BOIP for the Prophet SP1 system is 1 per I/A/SBCT (2 sensors per Military Intelligence Company). There are 2 systems per Battlefield Surveillance Brigade (BfSB) Military Intelligence Battalion with 3 sensors per system. The ARNG is authorized for 97 sensors (D04182) with 57 on hand (60 percent EOH), while the control vehicle (D77801) is authorized for 27 with 26 on hand (96 percent EOH). These shortages affect Divisions, BCTs, EMIBs, and other units with no fielding solutions until FY 2021–FY 2023 or beyond, except for mobilizing units. There are also compatibility issues between the POR-B system and the Spiral 1 that need to be addressed.

Investment in New Procurement and Modernization: The Guard has the least modern Prophet systems of all 3 components. Cascaded equipment fielding's from component 1 are being delayed due to extended time losing units must spend bringing equipment to 10/20 standards, delaying modernizing our force. The modernization plan has component 1 field the new POR-B systems and then cascade the SP1 systems to the ARNG.

Table 2-12. Army National Guard Top IEW Modernization Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
Prophet Control	D77801	$318,000	$954,000
Prophet Sensor	D04182	$1,400,000	$47.6M

i. Engineering and Mobility Portfolio

The ARNG portfolio provides a versatile mix of capabilities, armored engineer vehicles, bridge support systems, construction, counter explosive hazard vehicles, engineer C2, and mines and munition area denial systems. The ARNG has 50 percent of the total Army Engineer force structure, enabling Engineer formations to provide support throughout military operations including homeland response and domestic support to civil authorities.

Investment in New Procurement and Modernization: In FY 2020, the Army's base budget procurement funding for the Army National Guard is $337 million, which accounts for 45 percent of the total Mobility portfolio investments of $747 million. The ARNG has 51 percent of the Engineer Structure while the Army Reserves maintains 30 percent, and Active Army maintains 20 percent. The FY 2020–FY 2024 base budget funding of $3.2 billion primarily reflects investments in modernizing Armored Engineer Vehicles, Bridging Support Systems, Counter Explosive Hazard Vehicles, and Enablers.

The funding for the equipment in *Table 2-13* was decremented (bill-payer) to support the Secretary and Chief of Staff of the Army's 6 modernization priorities. Specifically, 35 percent 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. The Active Army will be 100 percent modernized while the Army National Guard will only be modernized at 65 percent. Therefore, 4 Multi-Role Bridge Companies will lack the same level of survivability and modernization as the Active Army. As a result, 224 CBTs within the ARNG will not be modernized, causing continued equipment and obsolescence issues. If this equipment is not modernized, it will degrade the lethality of our BCT's by hampering mobility across the battlefield.

The Type II All-Terrain Heavy Crane was decremented across the Future Year Defense Program, resulting in all 45 ARNG Vertical Engineer Construction Companies (VCC) losing the capability needed to support the Brigade Combat Teams. Thirty-five states and territories will be affected and Michigan, Louisiana, North Carolina, and Puerto Rico will be impacted the most. The AC will meet 100 percent of their requirement while Army National Guard is projected to meet 50 percent. The 25-ton Crane does not meet the capability gap that the All-Terrain Crane (60-ton) does.

All funding for the Hydraulic Electric Pneumatic Petroleum Operated Equipment (HEPPOE) was removed in the Future Year Defense Program creating a shortage of 202 HEPPOEs within the ARNG. Forty-two percent of Army National Guard Engineer force will lack the capability needed to perform construction and combat tasks in support of the Joint Functional Concepts of Protection, Force Application, and Focused Logistics. Georgia, the District of Columbia, Delaware, Connecticut, Kentucky, Louisiana, Michigan, Minnesota, Nebraska, Nevada, Ohio,

Puerto Rico, Tennessee, Utah, Vermont, Virgin Islands, Virginia, and Wisconsin may be affected.

The Hydraulic Excavator Type I (HYEX) was decremented, causing Engineer Construction Companies (ECC) to fall short of their requirement. ARNG Units will only be fielded two out of three systems. The Active Army will be fielded to 99 percent of their requirement while the ARNG will be fielded to 57 percent of their requirement. This decrement creates the inability to perform missions to repair, maintain, and construct main supply routes; water, pipeline, and sewer systems; combat roads and trails; airfields; and railroads throughout a theater of operations. Without this equipment, the ARNG cannot meet the CSA's priority of developing a lethal and competent force.

Table 2-13. Army National Guard Top Engineering and Mobility Modernization Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total Cost
Transporter Common Bridge M1977A4	T05067	$400K	$92.8M
Excavator: Hydraulic Type I (HYEX)	E27792	$350K	$12.3M
Heavy Crane 50T Type II	Z05089	$1.7M	$68M
Hydraulic Electric Pneumatic Petroleum Operated Equipment (HEPPOE)	H05004	$230K	$31.7M

j. Combat Service Support (CSS) Sustainment Portfolio

This portfolio is comprised of maintenance, medical, quartermaster and munitions capabilities that are, in many cases, essential to both the National Guard's wartime mission and domestic operations. 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 and decrease personnel requirements. The Maintenance Support Device is used for troubleshooting, diagnostic testing, and hosting Interactive Electronic Technical Manuals (IETMs).

Investment in New Procurement and Modernization: The ARNG is projected to achieve 68 percent of its Maintenance Support Device authorization by the end of FY 2019, severely hindering maintenance capabilities for ARNG BCTs in Alabama, Missouri, Washington, Illinois, Wisconsin and other states. Similarly, the ARNG is projected to achieve 55 percent of its HIPPO authorization, which hinders Fires Brigades units in Kentucky and Tennessee and Engineer units in Maine, Missouri, and other states supporting both wartime and DSCA missions for potable water.

The MFS-TRM provides a 2,500 gallon fuel storage and distribution capability. The ARNG is projected to achieve 30 percent of its authorization by the end of FY 2019, which hinders the ARNG's ability for fuel storage and distribution capability for BCTs in Alabama, Missouri, Washington, Illinois, and Wisconsin, among other states. The current plan is that the Army will buy its full Army Acquisition Objective for the MFS-TRM requirement with base dollars by FY 2023. The ARNG makes up 41 percent of the total Army requirement.

The Next Generation Automatic Test Set (NGATS) provides diagnostic maintenance support for all variants of the Abrams tank, Bradley fighting vehicle, Paladin artillery system, and Avenger Air Defense system. The current capability of NGATS in ARNG TDA maintenance facilities supporting 5 ARNG ABCTs across 13 split states does not exist. Without these NGATS in maintenance facilities, ARNG ABCTs will not be able to conduct the maintenance mission for critical weapons systems on M1A2 Tanks and M2A3 Bradley fleets, severely diminishing unit level readiness. *Table 2-14* highlights future investment costs necessary to meet these sustainment capabilities.

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

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total PUC Cost
Load Handling System Compatible Water Tank Rack (HIPPO)	T32629	$131,839K	$80,554M
Modular Fuel System, Tank Rack Module (MFS-TRM)	T20131	$95,000K	$65,930M
Maintenance Support Device (MSD)	T92889	$16K	$65.6M
Next Generation Automatic Test Set (NGATS)	Z	$1.1M	$53.6M

k. Combat Service Support Transportation Portfolio

The ARNG Tactical Wheel Vehicle (TWV) encompasses multiple vehicle types and variants to achieve the myriad combat missions and provide support to HD and DSCA operations. TWV capabilities are essential to the Army's mission and reside in almost every formation within the ARNG. The TWV fleet includes Light, Medium, and Heavy Tactical Vehicles with associated trailers, as well as the Mine Resistant Ambush Protected (MRAP) family of vehicles.

Investment in New Procurement and Modernization: The ARNG has significant 34-ton and 25-ton semitrailer shortages that impact IBCTs in Vermont, Texas, California, Ohio, Hawaii, and Indiana, among other states and territories. The ARNG recovery capability with the M984A4 Wrecker is projected to achieve 63 percent of its modernization requirement by the end of FY 2019. Wrecker funding ends after FY 2020, severely hindering recovery capability of Heavy Expanded Mobility Tactical Truck (HEMTT) vehicles or light tactical wheeled vehicles across ARNG BCTs in Alabama, Missouri, Washington, Illinois, and Wisconsin, among other states. Current procurement is not enough to mitigate the capabilities gap and health of trailer shortfalls.

The funding the ARNG has received through National Guard and Reserve Equipment Appropriation (NGREA) and Congressional Line Add for the past six years has enabled completion of modernization of the HMMWV Ambulance and the Tube-launched Optically tracked Wire-guided/Improved Target Acquisition System (TOW/ITAS) HMMWV fleets, and has improved modernization levels of the Heavy Tactical Vehicle fleet. The Small Utility Support Vehicle (SUSV) supports ARNG units in Alaska, Colorado, Minnesota, and Vermont in support of civil authorities in extreme cold weather, as well as in training for all Army combat units at the U.S. Army Cold Weather Training Center in Alaska and the U.S. Army Mountain Warfare Training Center in Vermont. The SUSV is no longer a program of record, receives no sustainment funding, and will be obsolete by FY 2022. Without a replacement for the SUSV, ARNG units in the four previously mentioned states will be severely degraded in their ability to

support combat training for Army units and medical evacuation and re-supply operations in extreme cold weather conditions for civil authorities (see *Table 2-15*).

Table 2-15. Army National Guard Top Transportation Modernization Shortfalls

Nomenclature	Line Item Number	Procurement Unit Cost (PUC)	Total PUC Cost
Semi-Trailer 34T	S70159	$106K	$209M
Semi-Trailer 25T	S70517	$67.6K	$14.6M
M984A4 Wrecker	T63161	$491,382	$213.8M
SUSV/JAASV		$850K	$78.5M

5. Other, Funding for New and Displaced Equipment Training and National Guard and Reserve Equipment Appropriation (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 2018, the ARNG received $24.2 million for NET/DET training events and activities, amounting to a slight increase over the previous year, but only half the requested amount. Limited training resources in support of equipping efforts will continue to significantly impact unit readiness and result in the states and territories utilizing other funds to support NET/DET.

The ARNG uses NGREA funding to mitigate key readiness shortfalls in equipment and modernization efforts. FY 2018 NGREA funded more than $337.3 million in aviation; communications, domestic operations, installations, intelligence, logistics, and maintenance, systems in support of HD and DSCA missions. The ARNG also invested $91.7 million of FY 2018 NGREA funding for the procurement of simulators and training systems to support both individual and collective training. These purchases support the ARNG's priority funding areas outside of the normal base budget.

D. Summary

The ARNG continues to modernize to improve the Army's capability for worldwide deployments and provide critical assets to the 50 states, 4 territories, and the District of Columbia for domestic and state missions. For this coming year, the ARNG will focus on better posturing itself towards the Army's Sustainable Readiness Strategy by increasing interoperability and modernization of equipment. This strategy requires a significant decrease in the use of authorized substitution and legacy equipment for the RCs, and timely distribution of cascaded equipment for proper training and deployment before it passes the Economic Useful Life. As the Army prioritizes modernization to increase lethality to win our nations' wars, the ARNG will likewise advocate for balance in modernization of combat support and combat service support units to assist and protect the homeland. Transparency efforts have steadily improved, however, effort is still required to ensure the ARNG can maintain interoperability and ensure mission success both at home and in its support of our CCDRs.

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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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Air Defense							
Fire Unit Vehicle-mounted: Avenger	F57713	$1,090,277	264	264	264	264	264
Radar Set Enhanced: AN/MPQ-64A3(V)1	R05014	$4,176,000	68	68	68	68	72
Radio Set: AN/USQ-140(V)2(C)	R42399	$300,000	81	81	81	81	97
Aircraft							
Airplane Cargo Transport: C-12F	A30062	$3,068,422	29	29	29	29	55
Airplane Cargo-Transport: C-26	A46758	$800,000	3	3	3	3	3
CH-47F Improved Cargo Helicopter*	C15172	$65,918,000	164	167	167	167	176
Helicopter Light Utility (LUH) UH-72A*	H31329	$8,337,154	209	209	209	209	210
Helicopter Utility: UH-60A*	K32293	$16,967,644	183	183	183	183	240
Helicopter Utility: UH-60L*	H32361	$16,967,644	375	383	383	383	383
Helicopter Utility: UH-60M*	H32429	$21,812,860	159	159	159	188	188
Helicopter Attack: AH-64D	H48918	n/d	72	72	72	72	96
MEDEVAC Helicopter: HH-60M*	M33458	$16,967,644	55	55	55	55	105
Small Unmanned Aircraft System (SUAS): Raven B (MIP)	S83835	$168,000	668	668	668	668	867
Terminal Video Multifunctional Remote UAS: AN/USQ-210	T81951	$80,000	1,074	1,074	1,074	1,074	1,190
Unmanned Aerial Vehicle (UAV): (TUAV-SHADOW)	U05001	$1,349,691	39	39	39	39	72
Unmanned Aircraft: RQ-7BV2	U05012	$738,194	52	52	52	52	52
Aviation							
Air Traffic Control Central: AN/TSW-7A*	A27624	$5,789,000	3	2	2	2	2
Command System: Tactical AN/TSQ-221*	C61597	$3,000,000	23	23	23	23	24
Computer System: Digital	C18391	$47,918	892	892	892	892	921
Maintenance Platform: Hyd Adj to 10ft H 44 1/2 in W	M02470	$1,916	0	0	0	0	159
Mobile Tower System (MOTS)	M05009	$7,770,313	9	9	9	9	14
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	1	1	1	1	4
Tester: Pitot and Static Systems TS-4463/P*	T03597	$31,763	220	220	220	220	271
Tool Kit Aircraft Maintenance: MOS 68J/68M Basic	W59034	$1,620	287	287	287	287	307
Tool Set Aviation Unit Maintenance: Set No 2 Airmobile*	W60206	$575,000	43	44	44	44	44
UH-60 Kit Aeromedical Evacuation*	K40878	$130,839	135	60	60	60	60
Battle Command C2							
Computer Set: Digital (JBC-P) AN/UYK-128B(V)3	C05036	$21,706	3,719	3,719	3,719	3,719	9,586
Computer Set: Digital (JBC-P LOG) AN/UYQ-90B(V)4	C05055	$16,676	436	436	436	436	1,374
Computer Set: Digital (JBC-P LOG) AN/UYQ-90B(V)5	C05054	$16,875	44	44	44	44	220
Computer Set: Digital (JBC-P) AN/GYK-62G	C05037	$16,000	266	266	266	266	549
Computer System: Digital*	C27963	$19,737	5,278	5,278	5,285	5,285	5,285
Distribution System Elec: 120/208V 3PH 40AMP*	F55485	$8,850	1,068	1,068	1,068	1,068	1,301

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Distribution System Elec: 120V 1PH 60AMP*	F55553	$10,123	2,100	2,100	2,095	2,095	2,095
Feeder System Electrical: 3PH 100 AMP	F55621	$12,885	441	441	441	441	469
Feeder System Electrical: 3PH 200 AMP	F55689	$17,280	82	82	82	82	97
Generator Set: DED TM 10kW 60Hz*	G42170	$19,177	77	77	77	77	77
Generator Set: DED TM 5kW 60Hz*	G42238	$25,135	626	626	626	626	626
Generator Set: DED 5kW 50/60Hz Skid-mtd*	G42488	$19,177	262	262	262	262	1,090
Generator Set: DED 10kW 400Hz Skid-mtd*	G74779	$25,533	61	61	61	61	61
Generator Set: DED 10kW 60Hz Skid-mtd*	G74711	$25,533	147	157	156	156	156
Generator Set: DED 15kW 50/60Hz Skid-mtd*	G12170	$23,724	58	58	58	58	58
Generator Set: DED 30kW 50/60Hz Skid-mtd*	G74575	$29,340	83	83	83	83	92
Generator Set: DED 5kW 60Hz Skid-mtd*	G11966	$19,177	724	724	723	723	742
Generator Set: DED 15kW 60Hz 3Ph AC 120/208 240/416V Skd Tac Util	J35835	$23,724	0	0	0	0	5
Generator Set: DED 10kW 400Hz Skid-mtd	G75018	$25,533	30	25	25	25	25
Generator Set: DED 30kW 50/60Hz Skid-mtd	G75200	$29,340	7	7	7	7	19
Generator Set: DED 15kW 50/60Hz Skid-mtd*	G49966	$23,724	49	49	49	49	238
Generator Set: DED 10kW 50/60Hz Skid-mtd*	G07461	$25,533	467	467	467	467	1,755
Generator Set: DED 10kW 400Hz mtd on M116A2 PU-799*	G53403	$33,519	1	1	1	1	1
Generator Set: DED TM PU-802*	G53778	$32,187	67	67	67	67	67
Generator Set: DED Trailer-mtd (TM) PU-803*	G35851	$41,800	21	21	21	21	21
Generator Set: DED TM 60kW 400Hz PU-806 Chassis	G17460	$43,751	1	1	1	1	1
Generator Set: DED TM 60kW 50/60Hz PU-805 Chassis*	G78306	$47,007	30	30	30	30	36
LTT Trailer-mtd: PP-3001 5 kW 50/60 Hz	L27002	$19,177	3	3	3	3	14
LTT Trailer-mtd: PU-2001 5 kW 50/60 Hz	L26934	$25,135	447	447	447	447	541
LTT Trailer-mtd: PU-2002 10 kW 50/60 Hz	L84622	$19,177	486	486	486	486	1,495
LTT Trailer-mtd: PU-2012 10kW 400Hz	L84758	$45,443	14	9	9	9	9
Navigation Set: Satellite Signals AN/GSN-13	N96180	$67,088	0	0	0	0	48
Nett Warrior System	N05004	$12,457	88	88	88	88	687
Power Plant: Electric DED TM 5kW 60Hz AN/MJQ-35*	P28083	$19,177	3	3	3	3	3
Power Plant: Diesel TM 10kW 60Hz AN/NJQ-37*	P42262	$53,929	52	52	52	52	61
Power Plant: Electric TM 30kW 50/60Hz AN/MJQ-40*	P42126	$47,007	38	38	38	38	38
Power Plant: Electric TM 60kW 50/60Hz AN/MJQ-41*	P42194	$47,007	48	50	50	50	58
Trailer-mtd: PP-3102 10kW 50/60Hz M200A1	T39849	$72,145	77	77	77	77	109
Trailer-mtd: PP-3105 30kW 50/60Hz 2M200A1	T39917	$47,007	37	37	37	37	66
Trailer-mtd: PP-3106 60kW 50/60Hz 2M200A1	T93232	$47,007	64	64	64	64	73
Trailer-mtd: PU-2101 15kW 50/60Hz M200A1	T40090	$44,157	396	396	396	396	1,088
Trailer-mtd: PU-2102 30kW 50/60Hz M200A1	T39954	$41,800	140	140	140	122	296
Trailer-mtd: PU-2103 60kW 50/60Hz M200A1	T60034	$47,007	3	3	3	3	146
Utility Receptacle*	U89185	$5,457	3,058	3,058	3,058	3,058	3,058
Battle Command Transport Networks							
Accessory Kit and Electronic Equipment: MK-3090/V	A05012	$269,019	0	0	0	0	2
Central Communications: AN/MSC-82	C05022	$3,100,000	0	0	0	0	3
Communication System: AN/MRC-150	C05023	$1,850,000	0	0	0	0	3

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Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Repeater Set Radio: AN/TRC-219	R05004	$1,066,695	0	0	0	0	1
Satellite Communication Subsystem: AN/TSC-185(V)3	S05013	$734,226	0	0	0	0	3
Switching Group Digital Data: OB-123/T	S05014	$212,843	0	0	0	0	2
Transportable Tactical Command: Communications Lite V1	T05071	$208,628	6	34	90	90	132
Transportable Tactical Command: Communications Heavy V2	T05073	$368,271	0	8	100	100	151
Battlespace Awareness							
Central Communications: AN/TSQ-226(V)1	C43263	$635,000	6	6	6	6	6
Central Communications: AN/TSQ-226(V)3*	C43399	$139,750	43	43	43	43	43
Central Communications: AN/TSQ226(V)2	C43331	$2,056,822	3	3	3	3	4
Computer System: Digital AN/PYQ-3	C18312	$32,000	248	248	248	248	258
Computer System: Digital AN/PYQ-8	C77823	$10,330	257	257	257	257	257
Detecting System Countermeasures: AN/MLQ-40(V)4	D04182	$1,400,000	57	57	57	57	97
Data Analysis Central: AN/MSW-24	D77801	$318,673	24	24	24	24	27
Ground Station Tactical Intelligence: AN/TSQ-179*	T37036	$4,644,000	35	35	35	35	39
Processing Center Intelligence Version 2: AN/TYQ-103(V)*	C18176	$1,200,000	32	32	32	32	39
Server Intelligence Fusion: AN/TYQ-94(V)2*	A35397	$56,000	425	422	423	423	423
Workstation Geospatial Intelligence: AN/TYQ-71(V)*	D11498	$443,968	168	168	168	168	199
Workstation Portable Multifunction: AN/TYQ-93(V)*	A35329	$4,000	2,233	2,233	2,234	2,234	2,234
Battalion Command Post (Switching Group): OM-XXX*	B67234	$250,000	521	521	520	520	520
Central Office Telephone Automatic: AN/TTC-XXX	C18291	$156,510,000	8	8	8	8	8
Central Office: Telephone Automatic	C20617	$4,081,375	16	16	16	16	16
Communication System: Tactical Terminal Control System (TTCS)*	C59125	$998,000	26	26	26	26	28
Computer Set General: AN/GKY-33E	C18297	$18,000	227	227	227	206	499
Computer System Digital: AN/PYQ-10(C)*	C05002	$2,000	44,639	44,639	44,639	44,639	50,551
Encryption-Decryption Equipment: KG-250X	E05011	$8,900	390	390	390	390	1,514
Encryption-Decryption Equipment: KG-175D	E05004	$23,457	2,555	2,582	2,582	2,582	2,582
Joint Node Network (JNN) Central Ofc Telephone Auto: AN/TTC*	J05001	$2,472,271	150	150	150	150	150
Receiver Suite: AN/TSR-8*	R30658	$159,585	222	222	222	222	344
Satellite Communication System: AN/TSC-156*	S23268	$4,000,000	37	37	37	37	48
Terminal: Satellite Communication AN/TSC-154	T81733	$4,411,733	69	69	69	69	111
Combat Mobility							
Anti-Personnel Mine Clearing System: Remote Control (M160)	A05002	$553,783	9	9	9	9	26
Assault Breacher Vehicle (ABV)	A05001	$5,200,583	18	18	18	18	18
Boat Bridge Erection Inboard Engine: Shallow Draft*	B25476	$224,258	130	130	130	130	130
Bridge Armor Vehicle Launch Scissor TY: CL 60 Alum 60ft	C20414	$87,742	16	16	16	16	16
Bridge Armored Vehicle Launched Scissors TY: 63 ft (AVLB) MLC 70*	B31098	$7,645,450	70	70	70	70	70
Bridge Fixed: Rapidly	B24592	$1,302,000	8	8	8	8	8
Detecting Set Mine: Portable Metallic (AN/PSS-11)	G02341	$24,641	173	173	173	173	173
Detecting Set: Mine AN/PSS-14	D03932	$24,641	3,578	3,578	3,578	3,578	7,496
Detecting Set: Mine AN/PSS-14C	D05016	$14,000	0	0	0	0	24
High Mobility Engineer Excavator (HMEE): Type I*	H53576	$405,500	349	349	349	349	461

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Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Instrument Set Reconnaissance and Surveying: AN/TKQ-5	D17191	$79,880	802	802	802	802	1,067
Launch M60 Series Tank Chass Trnsptg: 40 and 60 ft Brdge TY CL60*	L43664	$4,641,558	88	88	88	88	88
Loader Scoop Type: 2.5 Cubic Yard*	L76897	$150,000	118	118	118	118	118
Loader Scoop Type: DSL 2-1/2cu yd Hinge Frme w/Multi Purp Bucket*	L76556	$141,500	247	247	247	247	310
Mine Protected Clearance Vehicle	M05004	$1,451,707	70	70	70	70	78
Mine Resistant Vehicle	M74226	$540,000	40	40	40	40	63
SOF Demolition Kit: M303	S93791	$31,671	111	111	111	111	144
Supplementary Set Bridge	U60216	$90,852	6	6	6	6	22
Transporter: Common Bridge (CBT) M1977A4	T05067	$400,000	7	7	7	7	8
Tool Kit: Urban Ops	T30195	$76,364	597	597	597	597	816
Tractor Wheeled: DSL 4X4 W/Excavator and Front Loader*	T34437	$328,201	28	28	28	28	21
Tractor Wheeled: Industrial*	T34505	$328,201	204	204	204	204	231
Transporter Common Bridge*	T91308	$280,613	615	615	615	615	628
Urban Operations: Platoon Kit	U88092	$177,553	383	383	383	383	525
Vehicle Mounted Mine Detection (VMMD) System	V05001	$2,828,522	139	139	139	139	156
Field Logistics							
Armament Repair Shop Set (ARSS)	A05031	$484,906	29	29	29	29	39
Assault Kitchen (Ak)	A94943	$95,000	553	553	553	553	966
Calibration Set Secondary Transfer: Standards	C72574	$713,335	9	9	9	9	15
Fire Suppression Refill System (FSRS)	Z05273	$269,000	0	0	0	0	36
Forward Area Water Point Supply System: (FAW SS)*	F42612	$151,958	46	46	46	46	46
Hydraulic Sys Test and Repair Unit (Mx3):	H05002	$86,547	219	219	218	218	218
Kitchen: Company Level Field Feeding	K28601	$57,963	7	7	7	7	7
Light Capability Rough Terrain Forklift (LCRTF): 5K*	L05010	$113,280	385	385	385	385	561
Load Handling Sys (LHS): 2000 Gal Comp Water Tank-Rack (HIPPO)*	T32629	$131,839	470	470	470	470	1,179
Machinist's Measuring Tool Set (MMTS)	M20190	$725	725	725	725	725	972
Maintenance Support Device:*	T92889	$16,000	10,966	10,966	10,966	10,966	16,194
Metal Working and Machining Shop Set (MWMSS): Type 1	Z05057	$596,083	0	0	0	0	56
Metal Working and Machining Shop Set (MWMSS): Type 2	Z05058	$471,914	0	0	0	0	53
Modular Fuel System-Tank Rack Module: W/Retail Capability	T20131	$95,000	289	289	289	289	1,453
Petroleum Quality Analysis System: Enhanced (PQAS-E)	P25743	$1,770	9	9	9	9	18
Test Kit Mask Protective: M41	T62350	$7,790	2,818	2,820	2,819	2,819	2,819
Trailer Tank Water (Camel): 800gal 5-ton W/E	T05047	$106,532	123	123	123	123	126
Transfer Set: Standards (Sup/Eq) AN/GSM-439	T05046	$151,469	7	7	7	7	13
Transfer: Set Standards AN/GSM-440	T05045	$713,335	8	8	8	8	12
Water Purification: Reverse Osmosis 3000 gph Trailer-mtd*	W47225	$455,871	75	75	75	75	81
Force Protection							
Alarm Biological Agent Automatic: (BIDS) M31A2*	A48680	$1,408,429	98	98	98	98	98
Chemical Biological Protective Shelter (CBPS Electric)	Z01533	$837,984	0	0	0	0	94
Decontaminating Apparatus Power Driven Skid-mtd: Multipurpose	F81880	$29,500	130	130	130	130	131
Public Address Set: AN/TIC-43	Z01674	$58,024	0	0	0	0	432

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Joint Service: Transportable Decontamination	J01197	$33,000	1,451	1,451	1,451	1,451	1,451
Nuclear Bio Chem Recon Veh: (NBC RV)*	N96543	$4,465,407	69	69	69	69	81
X Ray Apparatus, Radiographic	FG353P	$620,000	14	14	14	14	0
General Engineering							
All Terrain Crane Type II: (Heavy)*	Z05089	$1,700,000	0	0	0	0	46
Compactor High Speed: Tamping Self-Propelled (CCE)*	E61618	$135,186	82	82	82	82	85
Crane Wheel-mtd: Hydraulic Light 7-1/2 ton W/Cab*	C36151	$165,922	216	216	216	216	223
Crane: Wheel Mounted Hydraulic 25-ton All Terrain AT422T*	C36586	$382,000	139	139	139	139	142
Crush Screen and Wash Plant: Dsl/Elec Drvn Whl-mtd 150-225 Tph	F49673	$2,766,000	8	8	8	8	8
Drilling Machine Well: Rotary Truck-mtd 600ft Min	D95754	$2,950,375	1	1	1	1	8
Engineer Rapid Airfield Construction Capability: Type II	Z05120	$68,560	0	0	0	0	108
Excavator: Hydraulic (HYEX) Type I Multipurpose Crawler Mount*	E27792	$348,371	121	121	121	121	228
Excavator: Hydraulic (HYEX) Type II Multipurpose Crawler Mount*	E41791	$354,259	9	9	9	9	9
Excavator: Hydraulic (HYEX) Type III Multipurpose Crawler Mount*	E27860	$354,259	10	10	10	10	10
Hydraulic Electric Pneumatic Petroleum Operate Equip (HEPPOE)	H05004	$230,000	293	293	293	293	376
Mixer Concrete Module: Pls 2600 gal	M81382	$127,160	32	32	32	32	39
Roller Motorized Steel Wheel: 2 Drum Tandem 10-14 ton (CCE)*	S11711	$101,449	19	19	19	19	19
Roller Motorized: Vibratory Roller Type II*	R11127	$88,000	222	222	222	222	234
Scraper Earth Moving Self-Propelled: 14-18 cu yd (CCE)*	S56246	$668,031	47	47	47	47	61
Scraper Earthmoving: 14-18 cu yd	S05029	$796,100	223	223	223	223	293
Scraper Elevating: Self Propelled 9-11 cu yd Sectionalized*	S30039	$441,923	108	108	108	108	134
Self Propelled Concrete Saw	Z05126	$97,200	0	0	0	0	18
Tactical Water Distribution Equip Set (TWDS-RDF)*	T09094	$350,000	4	4	4	4	6
Tractor Fl Trkd Low Spd: Dsl Lgt Dbp Air Dropbl W/Angdoz W/Winch	W76285	$71,441	2	2	2	2	20
Tractor FT: Low Speed - T9 Type II W/Ripper	T05016	$316,096	198	198	198	198	198
Tractor FT: Low Speed - T5 Type II W/Ripper	T05026	$199,262	71	71	71	71	72
Tractor Full Tracked High Speed: Armored Combat Earthmover (ACE)*	W76473	$887,050	54	54	54	54	56
Tractor Full Tracked High Speed: Deployable Lt Engineer (DEUCE)*	T76541	$398,000	87	87	87	87	126
Tractor Full Trckd Low Spd: DSL Med Dbp W/Buldoz W/Scarif Ripper*	W83529	$354,000	43	43	43	43	44
Tractor Full Trckd Low Spd: Dsl Med Dbp W/Buldoz W/Scarif Winch*	W76816	$354,000	83	83	83	83	105
Tractor Full Tracked Low Speed: T5	T05029	$188,638	66	66	66	66	66
Tractor Full Tracked Low Speed: T9*	T05015	$316,096	229	229	229	229	229
Truck Well Drilling Support	T94171	$84,792	1	1	1	1	8
Maneuver Combat Vehicles							
Anti-Tank Guided Missile Vehicle (ATGM)	A83852	$5,696,258	18	18	18	18	18
Carrier 120mm Mortar: Self Propelled Armored	C10990	$511,343	96	96	96	96	96
Carrier Armored Command Post: Full Tracked	C11158	$1,011,652	345	345	345	345	404

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Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Carrier Cargo Tracked: 1.5-ton M973	C11280	$125,969	0	0	0	0	102
Carrier Command Communication Vehicle: Articulated Tracked 1.5-ton	C11651	$209,490	0	0	0	0	11
Carrier Command Post: Light Tracked	D11538	$1,011,652	69	69	69	69	69
Carrier Personnel Full Tracked: Armored (RISE)	C18234	$511,343	609	609	609	609	609
Command Variant Vehicle (CV)	C41314	$3,725,807	64	64	64	64	64
Engineer Squad Vehicle (ESV)	J97621	$4,957,665	24	24	24	24	24
Fighting Vehicle: Full Tracked Infantry (IFV) M2A3	F60564	$6,661,335	269	269	269	269	280
Fighting Vehicle: Full Tracked Infantry Hi Survivability (IFV)	F40375	$3,006,569	17	17	17	17	17
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
Knight: Armored	K29708	$1,820,000	61	61	61	61	61
Medical Evacuation Vehicle (MEV)*	M30567	$3,785,691	50	50	50	50	50
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	383	383	383	383	383
Reconnaissance Vehicle (RV)	R62673	$2,544,614	104	104	104	104	114
Recovery Vehicle Full Tracked: Heavy M88A2	R50885	$2,748,846	176	176	176	176	195
Recovery Vehicle Full Tracked: Medium	R50681	$3,593,524	166	166	166	166	166
Tank Combat Full Tracked: 120mm Gun	T13168	$7,598,833	297	297	297	297	303
Tank Combat Full Tracked: 120mm Gun M1A2	T13305	$7,598,833	165	165	165	165	202
Maneuver Systems							
Surveillance System: Scout Long Range AN/TAS-8*	S02976	$514,063	758	758	758	758	762
Target Acquisition System: TOW Improved ITAS M41	T24690	$725,000	718	718	718	718	751
Medical Field Systems							
Analyzer Blood (AB)	A83359	$8,281	199	199	199	199	207
Automatic External Defibrillator (AED)	A05034	$2,720	124	124	124	124	220
Computer Set: Digital AN/TYQ-106(V)1	C18345	$3,832	3,018	3,018	3,018	3,018	3,102
Computer Set: Digital AN/TYQ-107(V)1	C18277	$4,282	2,108	2,108	2,108	2,108	2,340
Computer Set: Digital AN/TYQ-107(V)2	C18209	$4,121	254	254	254	254	323
Computer System: Digital AN/TYQ-105(V)1	C27503	$1,700	10,892	10,892	10,892	10,892	11,183
Computer System: Digital AN/TYQ-108(V)3	C27639	$4,462	548	548	548	548	597
Defibrillator Monitor Recorder: 120/230V 50/60Hz AC or DC*	D86072	$19,000	682	682	682	682	824
Dental Field Treatment Operating System	D44052	$20,843	68	68	68	68	68
Dental Filmless Imaging System (DFIS)	D44302	$38,749	72	72	72	72	72
Electrocardiograph: Solid State Amplifier Port115V 60Hz Ac	E17591	$4,479	98	98	98	98	286
Medical Equipment Set Air Ambulance*	M29213	$26,864	317	317	317	317	317
Medical Equipment Set Ground Ambulance*	M26413	$24,217	1,899	1,899	1,899	1,899	1,899
Medical Equipment Set Tactical Combat Medical Care*	M30499	$45,000	857	857	857	859	859
Medical Equipment Set Water Qual Analysis Preventive Medicine*	Y36849	$15,154	51	51	51	51	53
Medical Filmless Imaging System	M30817	$150,000	76	76	76	76	76
Monitor Patient Vital Signs (MVS)	M66626	$18,000	314	314	314	314	314

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Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Oxygen Generator: Field Portable (OGFP)	P05027	$18,831	589	589	589	589	1,736
Pump Intravenous Infusion Piv	P16161	$7,408	685	685	685	685	888
Refrigerator Solid State Bio:*	R64126	$11,012	185	185	185	185	185
Sink Unit Surgical Scrub and Utensil Hospital Field: 110V 60C AC*	T60464	$1,638	118	118	118	118	148
Sterilizer Surg Instr Dress: Pres Extr Htdcrs 12-1/2 by 12-1/2in	U39016	$10,761	136	136	136	136	136
Ultra Sound Diagnostic System: Hand-Carried	U26813	$79,351	8	8	8	8	8
Ventilator Volume Portable*	V99788	$12,120	561	561	561	561	680
X-Ray: Apparatus Dental Miniature*	X38819	$8,042	76	76	76	76	78
Soldier Systems							
Illuminator Integrated: Small Arms Storm MLRF	J68653	$16,383	2,451	2,451	2,451	2,451	8,734
Laser: Target Locator Module	L05003	$43,241	1,915	1,915	1,915	1,915	4,034
Maneuverable Canopy 6 (MC 6): Personnel Parachute System	A46878	$5,140	5,829	5,829	5,829	5,829	8,910
Military Freefall Advanced RAM Air Parachute System	M05026	$13,700	216	216	216	216	558
Night Vision Device: AN/PSQ-20	N07848	$11,398	3,282	3,282	3,282	3,282	8,466
Soldier Weapons							
Carbine 5.56mm: M4A1	C06935	$1,772	113,072	113,072	113,072	113,072	259,265
M205: Machine Gun Tripod	X05002	$4,013	9,860	9,860	9,860	9,860	14,568
Mount Tripod Machine Gun: Heavy Caliber .50	M75577	$4,013	9,744	9,812	9,812	9,781	9,847
Rifle Recoilless: 84mm (MAAWS)	R45101	$16,642	156	156	156	156	426
Rifle 5.56mm: M16A2*	R95035	$1,773	14,265	14,265	14,265	14,265	19,801
Rifle: 5.56mm M4*	R97234	$2,076	653	653	653	653	1,132
Rifle: 5.56mm M16A4	R97175	$1,773	869	869	869	869	869
Strike							
A3 Bradley Fire Support Team (BFIST): W/Fire Support Sensor System (FS3)	A70576	$4,393,650	26	26	26	26	65
High Mobility Artillery Rocket System: HIMARS	H53326	$4,628,795	199	199	199	199	201
Howitzer Light Towed: M119A3	H05007	$1,400,000	234	234	234	234	258
Howitzer Medium Self Propelled	H57642	$13,322,229	234	234	234	234	294
Howitzer Medium Towed: M777	H57916	$3,571,429	244	244	244	244	268
Lightweight Counter Mortar Radar: AN/TPQ-50	L05007	$1,200,000	92	92	92	92	124
Multiple Launch Rocket System (MLRS): M270A1 Improved Launcher	M82581	$4,493,091	34	34	34	34	37
Radar Set: AN/TPQ-36(V)10	R14284	$8,500,000	27	27	27	27	41
Radar System: Counter Fire Target Acquisition Radar	R05016	$13,100,000	13	13	13	13	25
Support Systems							
Container Handling*	C27294	$42,249	866	866	866	854	854
Container Handling: Container Handling Unit (CHU)*	C84862	$42,249	3	3	3	3	14
Container Handling: Heavy Exp Mobil Tact Trk (HEMTT)*	C84930	$42,249	32	32	32	32	32
Firing Device Demolition: Mk152 Mod 0	F60336	$61,157	173	173	173	173	406
Joint Precision Airdrop System (JPADS): 10K	J05004	$69,117	28	28	28	28	28
Platform: Container Roll In/Roll Out*	B83002	$25,097	14,683	14,683	14,683	14,683	17,427

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Trailers							
Palletized Load System: Trailer-CTE	P05025	$109,794	404	404	404	404	580
Semitrailer Flat Bed: Breakbulk/Cont Transporter 22-1/2 ton*	S70027	$42,678	3,363	3,363	3,363	3,363	3,363
Semitrailer Flatbed: Breakbulk/Container Transporter Commercial 34-ton*	S70159	$105,069	2,011	2,011	2,011	2,011	4,002
Semitrailer Low Bed: 25-ton 4-Wheel W/E*	S70517	$67,600	183	183	183	183	516
Semitrailer Low Bed: 40-ton 6-wheel W/E	S70594	$51,900	1,257	1,257	1,257	1,257	1,187
Semitrailer Low Bed: 70-ton Heavy Equipment Transporter (HET)	S70859	$610,664	462	462	462	462	462
Semitrailer Tank: 5000 Gal Bulk Haul Self-Load/Unload*	S10059	$146,093	281	281	281	281	300
Semitrailer Tank: 5000 Gal Fuel Dispensing Automotive*	S73372	$198,020	151	151	151	151	151
Trailer Cargo: 1-1/2 ton 2-Wheel	W95811	$50,433	44	44	44	44	126
Trailer Cargo: 5-ton Light Engineer Utility Trailer	Z05186	$75,055	0	0	0	0	8
Trailer Cargo: MTV W/Dropsides M1095*	T95555	$50,433	6,045	6,045	6,045	6,045	6,159
Trailer: Palletized Loading 8X20 M1076*	T93761	$88,639	5,003	5,003	5,003	5,003	5,561
Trucks							
M-ATV UI W/Crow System	M05029	$575,000	90	90	90	90	90
M-ATV UI W/OGPK	M05030	$575,000	159	159	159	159	183
Tractor Line Haul: M915A5*	T88858	$212,000	944	944	944	944	2,001
Truck Ambulance: 2-Litter Armd 4X4 (HMMWV)	T38707	$397,000	1	1	1	1	2
Truck Ambulance: 4-Litter Armd 4X4 (HMMWV)*	T38844	$397,000	1,725	1,725	1,725	1,725	1,725
Truck Cargo: 2 1/2 ton 4X4 LMTV W/E W/W LAPES/AD	T42063	$203,039	4	4	4	4	7
Truck Cargo: 4X4 LMTV W/E	T60081	$157,982	2,872	2,872	2,872	2,872	2,872
Truck Cargo: 5-ton 6X6 MTV W/E LAPES/AD	T41036	$210,180	63	63	63	63	101
Truck Cargo: 5-ton 6X6 MTV W/E W/W LAPES/AD	T41104	$220,616	13	13	13	13	23
Truck Cargo: 5-ton WO/Winch*	T41515	$223,727	5,186	5,186	5,186	5,186	5,529
Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10*	T40999	$1,075,209	872	874	874	873	873
Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10 W/MHE*	T41067	$1,075,209	76	76	76	76	82
Truck Cargo: MTV W/E*	T61908	$255,952	1,671	1,671	1,671	1,671	1,671
Truck Cargo: MTV W/E W/W*	T41135	$255,952	394	394	394	394	601
Truck Cargo: W/MHE WO/Winch	T59584	$255,889	588	588	588	588	603
Truck Cargo: WO/Winch*	T59448	$157,982	3,783	3,783	3,783	3,783	3,892
Truck Dump: 10-ton WO/Winch*	T65342	$242,585	1,215	1,215	1,215	1,215	1,215
Truck Dump: 20-ton DED 12 cu yd Cap (CCE)*	X44403	$211,764	580	580	580	580	644
Truck Dump: 5-ton 6X6 MTVW/E LAPES/AD	T65526	$242,585	2	2	2	2	2
Truck Dump: MTV W/E	T64911	$242,585	3	3	3	3	8
Truck Dump: MTV W/E W/W	T64979	$383,786	0	0	0	0	3
Truck Palletized Loading: M1074A1	T55236	$406,000	121	121	121	121	217
Truck Tractor: M107A1	T05012	$461,970	384	384	384	384	442
Truck Tractor: (LET)*	T60946	$319,009	1,230	1,230	1,230	1,230	1,230
Truck Tractor: LET 6X6 66000 GVW W/W C/S*	T91656	$250,614	92	92	92	92	92
Truck Tractor: Line Haul C/S 50000 GVWR 6X4 M915*	T61103	$212,000	165	165	165	165	165
Truck Tractor: M1088A1P2 W/Winch	T61375	$242,669	1	1	1	1	12

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature[1]	Equip No.	Unit Cost	Begin FY 2019 QTY O/H	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	End FY 2021 QTY O/H	End FY 2021 QTY REQ
Truck Tractor: MTV W/E*	T61239	$242,669	863	863	863	863	863
Truck Tractor: MTV W/E W/W*	T61307	$242,669	103	103	103	103	208
Truck Tractor: WO/Winch*	T88983	$242,669	2,084	2,084	2,084	2,084	2,209
Truck Utility: ECV Armament Carrier W/IAP Armor Ready M1151A1*	T34704	$129,376	5,389	5,389	5,389	5,389	5,389
Truck Wrecker*	T94671	$690,707	708	708	708	709	709
Truck Wrecker: M984A4*	T63161	$491,382	655	655	655	655	731
Truck Wrecker: MTV W/E W/W*	T94709	$690,707	53	53	53	51	51
Truck Wrecker: Tactical 8X8 HEMTT W/Winch*	T63093	$886,000	401	401	401	401	401
Truck: Palletized Loading*	T81874	$418,000	858	858	858	858	954
1. "*" indicates a Critical Dual Use (CDU) equipment item							

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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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Helicopter Cargo Transport: CH-47D	H30517	7	Economic Useful Life (EUL) 17-25 years
Helicopter Light Utility (LUH): UH-72A	H31329	8	EUL 17-25
Helicopter Utility: UH-60L	H32361	27	EUL 17-25 (Past EUL)
Helicopter Utility: UH-60M	H32429	12	EUL 17-25
Helicopter Attack: AH-64D	H48918	15	EUL 17-25
Helicopter Utility: UH-60A	K32293	36	EUL 17-25 (Past EUL)
Airplane Cargo Transport: C-12D	A29812	35	EUL 17-25 (Past EUL)
Airplane: Cargo Transport C-26	A46758	26	EUL 17-25 (Past EUL)
Airplane: Cargo Transport	BA108Q	26	EUL 17-25 (Past EUL)
Aviation			
Aviators Night Vision Imaging System: AN/AVS-6(V)1	A06352	16	EUL 8-15 (Past EUL)
Battle Command C2			
Generator Set: DED Skid-mtd 5kW 60Hz	G11966	15	EUL 17-25
Generator Set: DED TM PU-803	G35851	15	EUL 17-25
Generator Set: DED: 60Hz AC MEP-531A	G36237	17	EUL 17-25
Generator Set: DED TM 10kW 60Hz	G42170	15	EUL 17-25
Generator Set: DED TM 5kW 60Hz	G42238	14	EUL 17-25
Generator Set: DED Trailer-mtd (TM) PU-802	G53778	14	EUL 17-25
Generator Set: DED Skid-mtd 10kW 60Hz	G74711	13	EUL 17-25
Generator Set: DED TM 60kW 50/60Hz PU805 Chassis	G78306	18	EUL 17-25
Generator Set: DED TM 15kW 60Hz	G78374	14	EUL 17-25
Power Plant: Electric TM 30kW 50/60Hz AN/MJQ-40	P42126	15	EUL 17-25
Power Plant: Diesel TM 10kW 60Hz AN/NJQ-37	P42262	18	EUL 17-25
Combat Mobility			
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	23	EUL 17-25
Cradle: Improved Boat (IBC) M14	C33925	14	EUL 17-25
Interior Bay Bridge Floating	K97376	16	EUL 17-25
Launch M60 Series Tank Chassis Transpt: 40/60ft Bridge	L43664	34	EUL 17-25 (Past EUL)
Loader Scoop Type: DSL 2-1/2 cu yd w/Multi Purp Bucket	L76556	34	EUL 15-40
Pallet: Bridge Adapter (BAP) M15	P78313	12	EUL 17-25
Ramp Bay Bridge Floating	R10527	17	EUL 17-25
Tractor Wheeled: DSL w/Excavator & Front Loader	T34437	30	EUL 15-40
Transporter Common Bridge	T91308	18	EUL 17-25
Tractor FT HS: Armored Combat Earthmover (ACE)	W76473	27	EUL 15-40
Field Logistics			
Containerized Kitchen (CK)	C27633	11	EUL 17-25
Truck Lift Fork: Variable Reach Rough Terrain	T73347	11	EUL 17-25
Water Purification: Reverse Osmosis 3Kgph TM	W47225	24	EUL 17-25
General Engineering			
Crane: Whl-mounted Hydraulic 25-ton All Terrain AT422T	C36586	18	EUL 15-40
Distributor Water Tank Type: 6K-gal Semitrailer-mtd (CCE)	D28318	34	EUL 17-25 (Past EUL)
Excavator: Hydraulic (HYEX) Type I	E27792	19	EUL 15-40

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Table 2

Average Age of Equipment

Nomenclature	Equip No.	Average Age	Remarks
Excavator: Hydraulic (HYEX) Type II	E41791	17	EUL 15-40
Compactor High Speed: Tamping Self-Propelled (CCE)	E61618	20	EUL 15-40
Grader Road Motorized: DED Heavy (CCE)	G74783	34	EUL 15-40
Fire Fighting Equipment Set: TM Multipurpose	H56391	34	EUL 15-40
Scraper Elevating: SP 9-11 cu yd sectionalized	S30039	11	EUL 15-40
Scraper Earth Moving: SP 14-18 cu yd (CCE)	S56246	34	EUL 15-40
Tractor FT HS: Deployable Lt Engineer (DEUCE)	T76541	17	EUL 15-40
Tractor FT LS: DSL Med DBP w/Buldoz w/Scarif Winch	W76816	39	EUL 15-40
Tractor FT LS: DSL Med DBP w/Buldoz w/Scarif Ripper	W83529	32	EUL 15-40
Maneuver Combat Vehicles			
Carrier Personnel Full Tracked: Armored (RISE)	C18234	33	EUL: 25-30 (Past EUL)
Bradley Fighting Vehicle M2A2 ODS SA	P19727	23	EUL 25-30
Bradley Fighting Vehicle M2A3	F60564	27	EUL 25-30
Fire Support Vehicle (FSV)	F86821	14	EUL 25-30
Infantry Carrier Vehicle (ICV)	J22626	12	EUL 25-30
Engineer Squad Vehicle (ESV)	J97621	12	EUL 25-30
Mortar Carrier Vehicle (MCV)	M53369	15	EUL 25-30
Mobile Gun System (MGS)	M57720	12	EUL 25-30
Recovery Vehicle Full Tracked: Medium M88A1	R50681	41	EUL: 25-30 (Past EUL)
Recovery Vehicle Full Tracked: Medium M88A2	R50885	13	EUL 25-30
Tank Combat Full Tracked M1A1	T13168	26	EUL 25-30
Tank Combat Full Tracked M1A2	T13305	26	EUL 25-30
Strike			
Carrier Ammunition Tracked Vehicle (CATV)	C10908	27	EUL 25-30
Howitzer Light Towed: M119A3	H05007	6	EUL 25-50
Howitzer Medium Self Propelled M109A6	H57642	30	EUL 25-50
Howitzer Towed: M777	H57916	9	EUL 25-50
Support Systems			
Container Platform: Roll-In/Roll-Out	B83002	24	EUL 17-25
Container Handling Unit (CHU)	C84862	13	EUL 17-25
Trailers			
Semitrailer Tank: 5K-gal Bulk Haul Self-Load/Unload	S10059	18	EUL 25-30
Semitrailer Flatbed: Breakbulk/Cont Transporter 22-1/2-ton	S70027	24	EUL 25-30
Semitrailer Flatbed: Breakbulk/Container Transporter 34-ton	S70159	28	EUL 25-30
Semitrailer Low-bed: 40-ton 6-wheel	S70594	28	EUL 25-30
Semitrailer Low-bed: 70-ton Heavy Equip Transporter (HET)	S70859	18	EUL 25-30
Semitrailer Tank: 5K-gal Fuel Dispensing Automotive	S73372	24	EUL 25-30
Trailer Flatbed: 11-ton 4-wheel (HEMAT)	T45465	18	EUL 25-30
Trailer: Palletized Loading 8X20	T93761	12	EUL 25-30
Trailer Cargo: MTV W/Dropsides M1095	T95555	8	EUL 25-30
Trailer Cargo: High Mobility 1-1/4-ton	T95924	10	EUL 25-30
Trailer: Light Tactical 3/4-ton	T95992	10	EUL 25-30
Trailer Flatbed: M1082 Cargo LMTV w/Dropsides	T96564	10	EUL 25-30

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Table 2

Average Age of Equipment

Nomenclature	Equip No.	Average Age	Remarks
Trucks			
Truck Utility: Heavy Variant (HMMWV) 10K GVW	T07679	19	EUL 20-25
Truck Utility: ECV Armament Carrier M1151A1	T34704	10	EUL 20-25
Truck Utility: M1152A1	T37588	9	EUL 20-25
Truck Ambulance: 4 Litter Armored (HMMWV)	T38844	19	EUL 20-25 Full buy out, older vehicles to be divested upon receipt
Truck Cargo: Tactical HEMTT w/Lt Crane W/W	T39518	31	EUL 20-25 (Past EUL)
Truck Cargo: Tactical HEMTT w/Med Crane	T39586	25	EUL 20-25
Truck Cargo: Tactical HEMTT w/Med Crane W/W	T39654	28	EUL 20-25 (Past EUL)
Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10	T40999	15	EUL 20-25
Truck Cargo: Heavy PLS Transporter 15-16.5 ton w/MHE	T41067	24	EUL 20-25
Truck Cargo: MTV W/W	T41135	14	EUL 20-25
Truck Cargo: MTV w/MHE	T41203	14	EUL 20-25
Truck Utility : M1165A1	T56383	9	EUL 20-25
Truck Tank: Fuel Servicing 2500G HEMTT W/W	T58161	24	EUL 20-25
Truck Tank: Fuel Servicing 2500G HEMTT W/W M978A4	T58318	11	EUL 20-25
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	21	EUL 20-25
Truck Cargo: Tactical HEMTT w/Lt Crane	T59278	30	EUL 20-25 (Past EUL)
Truck Cargo: Tactical HEMTT w/Med Crane M985A4	T59380	13	EUL 20-25
Truck Cargo: LMTV	T60081	14	EUL 20-25
Truck Cargo: LMTV W/W	T60149	14	EUL 20-25
Truck Tractor: Tactical HEMTT M983A4	T60946	7	EUL 20-25
Truck Tractor: Line Haul C/S 50000 GVW 6X4 M915	T61103	23	EUL 20-25
Truck Tractor: MTV	T61239	9	EUL 20-25
Truck Tractor: MTV W/W	T61307	14	EUL 20-25
Truck Cargo: MTV LWB	T61704	14	EUL 20-25
Truck Cargo: MTV	T61908	13	EUL 20-25
Truck Wrecker: Tactical HEMTT W/W	T63093	20	EUL 20-25
Truck Wrecker: Tactical HEMTT W/W M984A4	T63161	12	EUL 20-25
Truck Dump: MTV	T64911	22	EUL 20-25
Truck Tank: Fuel Servicing 2500G HEMTT	T87243	20	EUL 20-25
Truck Tractor: LET 6X6 66000 GVW W/W C/S	T91656	18	EUL 20-25
Truck Van: LMTV	T93484	13	EUL 20-25
Truck Wrecker: MTV W/W	T94709	13	EUL 20-25
Truck Cargo: Tactical 8X8 HEMTT w/LHS	T96496	13	EUL 20-25
Truck Dump: 20-ton DED 12 cu yd Cap (CCE)	X44403	26	EUL 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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2018 would be expected to arrive in RC inventories in FY 2019 or FY 2020. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
Aviation			
Civilian Communications Package (A-Kit and B-Kit) (H-60)	$36,260,000		
Civilian Communications Package (A-Kit and B-Kit) (UH-72)	12,720,000		
Forward Looking Infrared Radar (FLIR) Upgrade (A-Kit and B-Kit) (UH-60)	9,774,200		
Tool Kit Equipment Sets (AH-64)	15,126,300		
Communications			
Joint Incident Site Communications Capability	17,000,000		
Training / Cyber			
Cyber Brigade/Battalion Training Equipment Package	18,000,000		
Cyber Protection Team Training Flyaway Kits	2,200,000		
Domestic Operations			
Information Management System, CBRN Response Enterprise	18,564,000		
Trailer, Decontamination	1,239,000		
Small Unit Support Vehicle	16,560,000		
Intelligence			
Sensitive Compartmented Information Facility (SCIF) Systems	3,000,000		
Temporary SCIF Systems	1,000,000		
Maintenance			
Maintenance Support Device	162,000		
Security			
Reaction Force Crowd Control Support Module	22,440,000		
Training			
Engine Diagnostics/Troubleshooting Trainer	1,250,000		
Conduct of Fire Trainer Mobile Situational Awareness Upgrade	11,319,100		
Mobile Distributed Learning Classroom -- Lite Equipment	1,980,000		
FlexTrain Systems	42,000,000		
Multipurpose Training Range, Targetry	1,121,000		
Multi-intelligence Entry Training Device	1,500,000		
Training / Aviation			
Cockpit Academics Procedural Trainer	3,074,400		
Synthetic Flight Training Simulator Upgrade	1,250,000		
Aviation Combined Arms Tactical Trainer Upgrade	3,000,000		
Engineering			
Hydraulic, Electric, Pneumatic, Petroleum Operated Equipment (HEPPOE)	6,960,000		

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2018 NGREA Equipment			
Aviation			
Deployment Support Kits (Tool Kits) (UH-60M)		$12,160,000	
Special Tool and Test Set (AH-64)		4,500,000	
Utility Helicopter Civil Communications Package		4,125,000	
External Hoist, Aircraft Mounted		6,141,000	
Forward Looking Infrared Radar (FLIR)		10,944,000	
Multifunction Display (MFD) Software Loader/Validator Test Set (UH-60)		6,450,000	
Reduced Size Extended Range Fuel System (RSERFS) (CH-47)		27,573,000	
Air Data Test Set Kit		5,586,000	
Compressor (Air Data Test Set Calibration		280,000	
25K Capacity 100 Foot Long External Load (CH-47)		2,970,000	
10K Capacity External Load Long (UH-60)		3,120,000	
Moving Map System and Monitor Upgrade (UH-72A)		39,055,000	
Transportability Kit (UH-72)		11,849,700	
Firefighting Bucket Kits		515,898	
Global Communications System		2,698,800	
Communications			
Joint Incident Site Communications Capability Block II End of Life		11,261,310	
Disaster Incident Response Emergency Communications Terminal		14,472,720	
Support System, Information Technology (M-Day Soldier Access)		16,300,000	
Domestic Operations			
Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)		825,000	
Crisis Management System		784,300	
Analytical Laboratory System		9,016,400	
Information Management System (CBRN)		19,500,012	
Tactical Operations Trailer (TOC) Upgrade WMD-CST		10,780,000	
Physiological Monitors		6,840,000	
Chemical Detector, Man Portable		3,500,024	
Small Unit Support Vehicle		16,000,000	
Installations			
Truck Fire Fight: Powered Pumper 750 to 1250 GPM		6,774,750	
Truck Fire Fight: Tanker/Brush 250-500 GPM		8,853,000	
Truck Firefighting: Pumper and Rescue		4,979,620	
Truck Fire Fight: Airfield Crash/Rescue 4x4		4,491,920	
Truck Fire Fight: Airfield Crash/Rescue 6x6		1,347,568	
Mobile Water Supply		3,096,288	
Heavy Duty Snow Plow		1,732,500	
Truck Van: Hazardous Material 4x2 21000 lb. GVW		3,014,298	
Intelligence			
Sensitive Compartmented Information Facility (SCIF) Equipment		1,500,000	

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Logistics			
Assault Kitchen		9,880,000	
Carpenters Tool Kit Squad, Type I		1,056,201	
Carpenters Tool Kit, Type III		3,262,518	
Electrician's Tool Kit, Type IV		5,620,014	
Mason & Concrete Tool Kit, Type V		11,035,815	
Common Remotely Operated Weapon Station Installation Kits		7,099,787	
Maintenance			
Maintenance Support Device		13,061,821	
TMDE Calibration Configuration		1,800,000	
Training			
Virtual Convoy Operation Trainer (COT) Computer Upgrade		15,129,000	
Virtual Convoy Operation Trainer (COT) Trailer Upgrade		7,656,000	
Un-Stabilized Gunnery Trainer Individual Suite Upgrade		5,664,000	
Combat Engineer Virtual Trainer (CEVT)		5,000,000	
Improved Moving Target Simulator (IMTS) Upgrade		2,540,000	
Targetry Lifecycle Upgrades		40,543,100	
Portable Targetry System		1,901,700	
Convoy Live Fire / Entry Control Point Range		796,200	
Training / Aviation			
Blackhawk Maintenance Trainer (BHMT-M) (UH-60M)		10,000,000	
Synthetic Flight Training Simulator (SFTS) Upgrade (UH-72A)		2,500,000	
Transportation			
Palletized Load System/Wrecker		1,415,736	
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

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
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
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	**$247,500,000**	**$429,000,000**	**$421,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Battle Command C2					
NETT Warrior System	N05004	+599			
Battlespace Awareness					
Data Analysis Central: AN/MSW-24	D77801	+1			
Combat Mobiity					
Transporter: Common Bridge (CBT) M1977A4	T05067	+4	+4		
Loader Scoop Type: DSL 2-1/2cu yd Hinge Frame w/Multipurpose Bucket	L76556	+4			
Field Logistics					
Kitchen: Company Level Field Feeding	K28601	+131	+2		
Maintenance Support Device	T92889	+393	+65		
Force Protection					
Mask Chem-Bio Joint Service General Purpose: Field M50	M12986	+8,067	+307		
General Engineering					
Hydraulic Electric Pneumatic Petroleum Operated Equipment (HEPPOE)	H05004	+13			
Tractor FT HS: Deployable LT Engineer (Deuce)	T76541	+11			
Tractor Full Tracked Low Speed: DSL Med Dbp W/Buldoz W/Scarif Winch	W76816	+10	+2		
Maneuver Combat Vehicles					
Recovery Vehicle Full Tracked: Medium	R50681	+4			
Soldier Systems					
Illuminator Integrated: Small Arms Small Tactical Optical Rifle Mounted (STORM) Micro-Laser Rangefinder	J68653	+6			
Soldier Weapons					
Carbine 5.56mm: M4A1	C06935	+118			

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Air Defense							
Computer: Tactical AN/GYQ-88	C77755	+43	n/d				
Radar Set: Sentinel AN/MPQ-64A1	G92997	+5	n/d				
Aviation							
Tester: Pitot and Static Systems TS-4463/P	T03597	+32	n/d				
Battle Command C2							
Computer Set: Digital AN/GYK-62	C13866	+37	n/d				
Computer Set: Digital AN/UYK-128	C18378	+4,140	n/d				
Computer System: Digital AN/PYQ-13 (GCCS-A)	C27588	+16	n/d				
Computer System: Digital	C27963	+8	n/d				
Generator Set: DED 60kW 50/60Hz Skid-mtd	G63256	+68	n/d				
Generator Set: DED TM 5kW 60Hz mtd on M116A2 PU-797	G42238	+10	n/d				
Generator Set: DED Skid-mtd 5kW 60Hz	G11966	+7	n/d				
Generator Set: DED 60Hz AC MEP-531A	G36237	+57	n/d				
Generator Set: 10kW 50/60Hz Skid-mtd	G07461	+24	n/d				
LTT Trailer-mtd: PU-2001 5kW 50/60Hz	L26934	+32	n/d				
LTT Trailer-mtd: PU-2003 15kW 50/60Hz	L84690	+4	n/d				
Power Supply: PP-6224/U	P40750	+280	n/d				
Trailer-mtd: PP-3106 60kW 50/60Hz 2M200A1	T93232	+4	n/d				
Trailer-mtd: PU-2101 15kW 50/60Hz M200A1	T40090	+22	n/d				
Battlespace Awareness							
Data Analysis Central: AN/MSW-24	D77801	+7	n/d				
Detecting System Countermeasures: AN/MLQ-40(V)4	D04182	+20	n/d				
Battle Command Transport Networks							
Battalion Command Post Switching Group: OM-XXX	B67234	+38	n/d				
Frequency Hopipng Multiplexer: TD-1456VRC	F99520	+135	n/d				
Joint Node Network (JNN) Central Office Telephone Auto: AN/TTC	J05001	+9	n/d				
Net Control Station: AN/TSQ-158	N04580	+6	n/d				
Radio Set	R55336	+10	n/d				
Radio Set: AN/PRC-119F(C)	R83141	+377	n/d				
Radio Set: AN/VRC-87F(C)	R67296	+10	n/d				
Radio Set: AN/VRC-88F(C)	R67330	+18	n/d				
Radio Set: AN/VRC-89F(C)	R44999	+569	n/d				
Radio Set: AN/VRC-90F(C)	R68044	+177	n/d				

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Radio Set: AN/VRC-91F(C)	R68146	+17	n/d				
Radio Set: AN/VSQ-2D(V)2	P99724	+89	n/d				
Teleconference System: AN/TYQ-122	T43146	+66	n/d				
Combat Mobility							
Assault Breacher Vehicle (ABV)	A05001	+6	n/d				
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	+9	n/d				
Field Logistics							
Advanced Aviation Forward Area Refueling System (AAFARS)	F42611	+6	n/d				
Hydraulic System Test and Repair Unit (MX3)	H05002	+16	n/d				
Load Handling System (LHS) Compatible, 2000-gal Water Tank Rack (HIPPO)	T32629	+170	n/d				
Truck Hand Platform: Wood Nontilt Type	X47818	+111	n/d				
Truck Lift Fork: DED 6000-lb Cap Rough Terrain	X48914	+6	n/d				
Truck Lift Fork: Gas 4000-lb	X51585	+3	n/d				
Truck Lift Wheel: Mechanical Lift 2400-lb	X53298	+143	n/d				
Truck Lift Fork Variable Reach Rough Terrain	T73347	+64	n/d				
Water Purification: Reverse Osmosis 3000-gph Trailer-mtd	W47225	+10	n/d				
Force Protection							
Chemical-Biological Protective Shelter (CBPS): M8	C07506	+49	n/d				
Joint Chemical Agent: Detector	J00697	+558	n/d				
Chemical-Biological Joint Service General Purpose Mask (JSGPM): Field M50	M12986	+948	n/d				
Chemical-Biological JCGPM: Combat Vehicle Crewman M51	M13236	+112	n/d				
Medical Field Systems							
Medical Equipment Set (MES) Combat Medic	U65480	+25	n/d				
Soldier Systems							
Basic Sight Assembly: Support Equipment (TOW 2)	B39044	+4	n/d				
IHADSS Integrated Helmet Unit	H35257	+64	n/d				
Laser: Target Locator Module	L05003	+454	n/d				
Target Locator Module	T27471	+186	n/d				
Strike							
Computer Set: AN/GYG-1(V)1	C17936	+23	n/d				
Computer System: Digital AN/PYG-1	C53293	+62	n/d				
Quadrant Fire Control: Gunners	Q03468	+11	n/d				
Lightweight Laser Designator Rangefinder (LLDR): AN/PED-1	R60282	+194	n/d				
Trailers							
Semitrailer Flatbed: Breakbulk/Container Transporter Commercial 34-ton	S70159	+101	n/d				
Semitrailer Low-bed: 15 to 25 ton 4-wheel	S70380	+5	n/d				

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Semitrailer Low-bed: 25-ton 4-wheel W/E	S70517	+9	n/d				
Trucks							
Truck Cargo: Tactical 8X8 Heavy Expanded Mobility w/LHS	T96496	+22	n/d				
Truck Utility ECV TOW/ITAS Carrier with IAP Armor-ready: M1167	T34840	+36	n/d				
Truck Wrecker: M984A4	T63161	+12	n/d				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Aircraft							
UH-60 Blackhawk M Model (MYP)				$259,450,000	$398,250,000		
UH-60 Blackhawk A and L Models				46,641,000	45,865,000		
Modification of Aircraft							
Utility/Cargo Airplane Modifications				7,357,000	7,218,000		
Network and Mission Plan				42,867,000	41,346,000		
Communications, Navigation, and Surveillance				33,162,000	33,162,000		
Global Air Traffic Management (GATM) Rollup				13,556,000	15,986,000		
RQ-7 UAV Modifications				0	13,556,000		
Support Equipment and Facilities							
Common Ground Equipment				30,331,000	27,065,000		
Air Traffic Control				22,268,000	21,745,000		
Other Missiles							
Multiple Launch Rocket System (MLRS) Reduced Range Practice Rockets (RRPR)				8,343,000	14,358,000		
Modification of Missiles							
Avenger Modifications				2,701,000	0		
Improved Target Acquisition System (ITAS) / TOW Modifications				13,160,000	13,160,000		
High Mobility Artillery Rocket System (HIMARS) Modifications				2,140,000	2,140,000		
Spares and Repair Parts (Missiles)				226,000	226,000		
Weapons and Tracked Combat Vehicles (WTCV)							
Howitzer, Medium Self-propelled Full-tracked 155mm M109A6 (Modifications)				24,032,000	20,482,000		
Improved Recovery Vehicle (M88A2 Hercules)				16,097,000	23,977,000		
M240 Medium Machine Gun (7.62mm)				0	4,942,000		
Mortar Systems				1,500,000	1,500,000		
XM320 Grenade Launcher Module (GLM)				5,472,000	2,703,000		
Carbine				11,665,000	10,628,000		
Handgun				2,167,000	0		
M777 Howitzer Modifications				4,028,000	4,028,000		
M4 Carbine Modifications				2,417,000	9,372,000		
M2 .50 cal Machine Gun Modifications				17,302,000	17,302,000		
M119 Howitzer Modifications				8,240,000	9,367,000		
Tactical and Support Vehicles							
Tactical Trailers/Dolly Sets				2,751,000	0		
Ambulance, 4 Litter, 5/4 Ton, 4x4				0	40,000,000		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
ARNG HMMWV Modernization Program				0	100,000,000		
Family of Medium Tactical Vehicles (FMTV)				9,000,000	83,117,000		
Firetrucks & Associated Firefighting Equipment				415,000	397,000		
Family of Heavy Tactical Vehicles (FHTV)				20,386,000	22,533,000		
Palletized Load System (PLS) Extended Service Program (ESP)				53,412,000	53,412,000		
Modification of In-service Equipment				19,789,000	15,601,000		
Nontactical Vehicles, Other				0	158,000		
Communications and Electronics Equipment							
Warfighter Information Network-Tactical (WIN-T) - Ground Forces Tactical Network				405,333,000	185,824,000		
Joint Incident Site Communications Capability				3,643,000	3,643,000		
SMART-T (Space)				2,000,000	2,000,000		
Global Broadcast Service (GBS)				1,000,000	1,000,000		
Mid-tier Networking Vehicular Radio (MNVR)				6,905,000	0		
Army Materiel Command (AMC) Critical Items - OPA-2				13,867,000	6,171,000		
Unified Command Suite				20,274,000	20,274,000		
Family of Medical Communications for Combat Casualty Care				11,519,000	8,542,000		
Information System Security Program (ISSP)				0	1,500,000		
Communications Security (COMSEC)				1,178,000	6,474,000		
Distributed Common Ground System - Army (DCGS-A) (MIP)				49,990,000	49,990,000		
Counterintelligence (CI) and Human Intelligence (HUMINT) Automated Reporting and Collection System (CHARCS) (MIP)				249,000	249,000		
Lightweight Counter Mortar Radar				28,212,000	27,928,000		
Sentinel Modifications				13,468,000	13,468,000		
Night Vision Devices				70,057,000	16,782,000		
Small Tactical Optical Rifle Mounted (STORM) Micro-Laser Range Finder (MLRF)				7,220,000	7,879,000		
Indirect Fire Protection Family of Systems				25,836,000	20,561,000		
Family of Weapon Sights (FWS)				11,044,000	0		
Artillery Accuracy Equipment				1,669,000	1,669,000		
Joint Battle Command - Platform (JBC-P)				23,960,000	27,078,000		
Modification of In-service Equipment (Lightweight Laser Designator/Rangefinder [LLDR])				9,081,000	9,298,000		
Counterfire Radars				143,884,000	141,699,000		
Air & Missile Defense Planning and Control System (AMDPCS)				13,110,000	13,110,000		
Network Management Initialization and Service				2,472,000	2,693,000		
Maneuver Control System (MCS)				61,985,000	53,459,000		
Global Combat Support System - Army (GCSS-A)				33,201,000	30,084,000		
Reconnaissance and Surveying Instrument Set				7,562,000	7,562,000		
Reserve Component Automation System (RCAS)				5,965,000	10,736,000		
Items Less Than $5M (Surveying Equipment)				1,128,000	1,232,000		
Other Support Equipment							
Husky Mounted Detection System (HMDS)				3,391,000	3,391,000		
Explosive Ordnance Disposal (EOD) Equipment				4,724,000	4,724,000		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Remote Demolition Systems				3,102,000	3,102,000		
Items Less Than $5M (Countermine Equipment)				1,800,000	0		
Family of Boats and Motors				3,873,000	4,335,000		
Heaters and Environmental Control Units (ECUs)				6,546,000	0		
Field Feeding Equipment				3,157,000	3,332,000		
Cargo Aerial Delivery & Personnel Parachute System				264,000	5,991,000		
Family of Engineer Combat and Construction Sets				14,647,000	16,392,000		
Quality Surveillance Equipment				1,353,000	1,353,000		
Distribution Systems, Petroleum & Water				17,250,000	17,250,000		
Combat Support Medical				22,098,000	19,582,000		
Mobile Maintenance Equipment Systems				12,018,000	10,242,000		
Items Less Than $5M (Maintenance Equipment)				1,328,000	1,146,000		
Grader, Road Motorized, Heavy, 6x4, (CCE)				1,063,000	1,063,000		
Scrapers, Earthmoving				14,051,000	14,051,000		
Tractor, Full Tracked				0	9,052,000		
All Terrain Cranes				8,652,000	0		
Enhanced Rapid Airfield Construction Capability (ERACC)				1,255,000	1,255,000		
Construction Equipment ESP				9,702,000	9,302,000		
Items Less Than $5M (Construction Equipment)				1,729,000	1,729,000		
Generators and Associated Equipment				57,034,000	0		
Family of Forklifts				4,818,000	4,818,000		
Training Devices, Nonsystem				28,085,000	29,751,000		
Close Combat Tactical Trainer				5,100,000	5,100,000		
Aviation Combined Arms Tactical Trainer				9,171,000	9,171,000		
Gaming Technology in Support of Army Training				3,264,000	4,665,000		
Calibration Sets Equipment				1,902,000	1,902,000		
Integrated Family of Test Equipment (IFTE)				17,173,000	18,020,000		
Test Equipment Modernization (TEMOD)				4,665,000	3,472,000		
Modification of In-service Equipment (OPA-3)				963,000	291,000		
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Aviation							
Weather Sensor						$450,000	$450,000
Digital Voice Switch						380,000	380,000
Airfield Automation System						175,000	175,000
Air Traffic Control Testing, Measuring, & Diagnostics Equipment						1,350,000	1,350,000
Crash Alarm System Upgrade						530,000	530,000
Reservoir Servicing Unit						409,200	409,200
Deployment Support Kits						1,750,000	1,750,000
Shadow Set Upgrade						11,000,000	11,000,000
Forward Looking Infrared Radar (FLIR) Upgrade (A-Kit and B-Kit) (UH-60)						18,240,000	18,240,000
Civilian Communications Package (A-Kit and B-Kit)						11,760,000	11,760,000
Precision Approach Radar Training System						150,000	150,000
Radio Test Set						2,014,000	2,014,000

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Synthetic Flight Simulator						1,500,000	1,500,000
Virtual Maintenance Trainer						500,000	500,000
Reduced Size Extended Range Fuel System						8,712,000	8,712,000
Reduced Size Extended Range Fuel System, Unit Support Package						480,000	480,000
Reduced Size Extended Range Fuel System, Intermediate Support Package						559,000	559,000
Borescope						594,000	594,000
Internal Auxiliary Fuel Tank System (A-Kit and B-Kit)						24,948,000	24,948,000
Blade Folding System						2,043,000	2,043,000
Cockpit Upgrades						3,498,000	3,498,000
Long Skid Shoes						254,000	254,000
Shadow Crew Trainer Upgrades						950,000	950,000
Maintenance Support Package						776,000	776,000
Command and Control Systems							
Power Supply						3,228,000	3,228,000
Communications							
Multi-band Receiver, Geospatial						916,800	916,800
GuardNet and Storage Area Network Modernization						49,229,100	49,229,100
Domestic Operations							
Audio Visual Equipment						2,300,000	2,300,000
Information Management System, CBRN						20,454,000	20,454,000
Area-Rae Wireless Toxic Gas Detector System Modernization						10,505,100	10,505,100
Detection System, Radiological						5,004,600	5,004,600
Thermal Desorber Accessory						2,262,900	2,262,900
Personal Protective Equipment Modernization						1,618,800	1,618,800
Portable-Radiation, Personnel Monitor						864,000	864,000
Engineering							
Motorized Grader						3,801,000	3,801,000
High Mobility Engineer Excavator						13,200,000	13,200,000
Squad Kit: Urban Operations						16,683,000	16,683,000
Platoon Kit: Urban Operations						25,760,000	25,760,000
Intelligence							
Sensitive Compartment Information Facility Systems						7,500,000	7,500,000
Logistics							
Carpenters Tool Kit Squad, Type I						2,368,000	2,368,000
Carpenters Supplemental Tool Kit, Type II						1,359,600	1,359,600
Carpenters Tool Kit, Type III						1,392,000	1,392,000
Electrician's Tool Kit, Type IV						2,550,000	2,550,000
Mason & Concrete Tool Kit, Type V						1,669,700	1,669,700
Modular Fuel System/Tank Rack Module						4,250,000	4,250,000
Maintenance							
Maintenance Support Device						1,275,000	1,275,000
Security							
Command Launch Unit Retro Fit (Javelin); Block 1						14,808,000	14,808,000

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Training							
Conduct of Fire Trainer Mobile Situational Awareness Upgrade						8,400,000	8,400,000
Mobile Distributed Learning Classroom Equipment						5,220,000	5,220,000
Modified Record Fire Range Targetry Package						1,440,400	1,440,400
Automated Infantry Squad Battle Course						107,000	107,000
Automated Record Fire Range Targetry Package						1,680,600	1,680,600
Combat Pistol Qualification Course Package						540,200	540,200
Engagement Skills Trainer Technology Refresh						5,070,000	5,070,000
Training / Aviation							
Control Tower Training System						1,620,000	1,620,000
Maintenance Trainer						3,500,000	3,500,000
Non Rated Crew Manned Module Simulator Upgrades						4,200,000	4,200,000
Aviation Combined Arms Tactical Trainer Upgrade						3,500,000	3,500,000
Transportation							
Truck; Wrecker RECAP						4,500,000	4,500,000
Truck; Palletized Loading (M1074/M1075)						4,200,000	4,200,000
Total				**$1,920,865,000**	**$1,928,983,000**	**$330,000,000**	**$330,000,000**

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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 2019 Qty	Deployable?	
					Yes	No
Air Defense						
Center Communication Operations: AN/TSQ-253(V)5	C17156	Communications Control Set (CCS): AN/TSQ-184A	C90735	3	X	
Command System: Tactical	C91673	Communications Control Set: AN/TSQ-183A	C90599	40	X	
Radar Set Enhanced: AN/MPQ-64A3(V)1	R05014	Radar Set Sentinel AN/MPQ1-64A1 (Mod)	G92997	4	X	
Aircraft						
Ground Control Station (GCS): (TUAV-Shadow)	G39497	Universal Ground Control Station 788 (UGCS-788):	U05011	2	X	
Helicopter Utility: UH-60A	K32293	Helicopter Utility: UH-60L	H32361	45	X	
		MEDEVAC Helicopter: HH-60M	U84291	8	X	
Helicopter Utility: UH-60M	H32429	Helicopter Utility: UH-60L	H32361	23	X	
MEDEVAC Helicopter: HH-60M	M33458	Helicopter Utility: UH-60L	H32361	20	X	
Portable Ground Control Station: SHADOW	P05001	Portable Ground Control Station (PGCS)	P05038	5	X	
Portable Ground Data Terminal (PGTD): (TUAV-SHADOW)	P05002	Portable Ground Data Terminal:	P05037	3	X	
Unmanned Aerial Vehicle (UAV): (TUAV-SHADOW)	U05001	Unmanned Aircraft: RQ-7BV2	U05012	20	X	
Aviation						
Detecting Set: Laser AN/AVR-2B(V)1	L60482	Unmanned Aircraft: RQ-7BV2	L60414	59	X	
Mobile Tower System (MOTS)	M05009	Air Traffic Control Central: AN/TSW-7A	A27624	4	X	
Radio Set: High Frequency AN/ARC-220 (V)2	R81623	Radio Set: High Frequency AN/ARC-220 (V)1	R22436	113	X	
Battle Command C2						
Air Conditioner 18000 BTUH Horizontal	A05048	Air Conditioner: Fl/Wall A/C AC 208V 3Ph 60Cy 18000 Btu Cmp Hz	A24463	331	X	
		Air Conditioner: Fl/Wall A/C AC 208V 50-60Cy 3Ph 36000Btu Cmp Hz	A24763	38	X	
Air Conditioner 18K LECU Horizontal:	A05049	Air Conditioner: Fl/Wall A/C AC 230V 1Ph 60Cy 18000 Btu Cmp Hz	A24017	129	X	
Air Conditioner 36000 Btuh Horizontal:	A05050	Air Conditioner: Fl/Wall A/C AC 208V 50-60Cy 3Ph 36000Btu Cmp Hz	A24763	27	X	
Air Conditioner 9000 Btuh Horizontal:	A05047	Air Conditioner: Fl/Wall A/C AC 115V 1Ph 50-60Cy 9000Btu Cmp Hz	A23828	81	X	
Computer Set Digital: AN/TYQ-151(V)1 ULLS-A(E)	C61191	Computer Set Digital: AN/TYQ-151(V)3	C61068	49	X	
		Com ULLS-AE W/Pt:	C40745	18	X	
Command System: Tactical	C40996	Rigid Wall Shelter: Command Post	R98145	5	X	
Computer Set: Digital (JBC-P) AN/UYK-128B(V)3	C05036	Computer Set Digital: AN/UYK-128	C18378	737	X	
Computer Set: Digital (JBC-P LOG) AN/UYQ-90B(V)4	C05055	Navigation Set: Satellite Signals AN/PSN-13	N96248	1,031	X	
Computer Set: Digital (JBC-P LOG) AN/UYQ-90B(V)5	C05054	Computer System: Digital AN/UYQ-90(V)3	C78851	68	X	
Computer Set: Digital (JBC-P) AN/GYK-62G	C05037	Computer Set Digital: AN/GYK-62	C13866	53	X	
		Computer Set Digtal: AN/GYK-65	C78804	33	X	
		Computer System: Digital AN/UYQ-90(V)3	C78851	100	X	
Computer System: Digital AN/UYQ-90(V)2	C18278	Navigation Set: Satellite Signals AN/PSN-13	N96248	2,210	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Generator Set De 60kW 50/60Hz: Skid-Mtd	G63256	Generator Set: DED Skid Mtd 60Kw 50/60Hz	G12034	151	X	
Generator Set: DED TM 5kW 60Hz	G42238	Power Plant: Electric DED TM 5kW 60Hz AN/MJQ-35	P28083	29	X	
Generator Set: DED TM 5kW 60Hz	G42488	Generator Set: DED 5kW 60Hz Skid-mtd	G11966	820	X	
Generator Set: DED 5kW 50/60Hz Skid-mtd	G18358	Generator Set: DED TM 5kW 60Hz mtd on M116A2 PU-797	G42238	327	X	
		Generator Set: DED 5kW 60Hz Skid-mtd	G11966	460	X	
Generator Set: DED 5kW 60Hz Skid-mtd	G11966	Generator Set: DED 10kW 60Hz Skid-mtd	G74711	107	X	
Generator Set: DED 10kW 400Hz Skid-mtd	G75018	Generator Set: DED 10kW 400Hz Skid-mtd	G74779	28	X	
Generator Set: DED 30kW 50/60Hz Skid-mtd	G75200	Generator Set: DED 30kW 50/60Hz Skid-mtd	G74575	12	X	
Generator Set: DED 15kW 50/60Hz Skid-mtd	G49966	Generator Set: DED 15kW 50/60Hz Skid-mtd	G12170	189	X	
Generator Set: DED 15kW 60Hz 3Ph AC 120/208 240/416V Skd Tac Util	J35835	Generator Set: DED Trailer-mtd PU-802	G53778	7	X	
		Generator Set: DED Trailer-mtd PU-803	G35851	5	X	
Generator Set Diesel: 60Hz AC MEP-531A	G36237	Generator Set: Ded Skid-mtd 3kW 60Hz	G18358	295	X	
Generator Set DED 10kW 50/60Hz: Skid-mtd	G07461	Generator Set: DED 10kW 60Hz Skid-mtd	G74711	1,290	X	
LTT Trailer-mtd: PP-3001 5 kW 50/60 Hz	L27002	Power Plant: Electric DED TM 5kW 60Hz AN/MJQ-35	P28083	5	X	
		Power Plant: Electric TM 30kW 50/60Hz AN/MJQ-40	P42126	6	X	
LTT Trailer-mtd: PP-3101/5 kW/50/60 Hz/M200A1	L27070	Power Plant Elec DED TM: 5kW 60Hz AN/MJQ-36	P28151	2	X	
LTT Trailer-mtd: PU-2001 5 kW 50/60 Hz	L26934	Generator Set DED TM: 5kW 60Hz mtd on M116A2 PU-797	G42238	95	X	
LTT Trailer-mtd: PU-2002 10 kW 50/60 Hz	L84622	Generator Set DED TM: 10kW 60Hz mtd on M116A2 PU-798	G42170	1,011	X	
LTT Trailer-mtd: PU-2003/15 kW/50/60 Hz	L84690	Generator Set: DED TM 15kW 60Hz	G78374	49	X	
		Power Plant: Electric Trailer Mounted	P63530	17	X	
Navigation Set: Satellite Signals AN/GSN-13	N96180	Navigation Set: Satellite Signals AN/PSN-13	N96248	48	X	
Power Supply: PP-6224/U	P40750	Power Supply: PP-2953/U	P38588	482	X	
Shelter: Nonexpandable S250	S01427	Shelter: Nonexpd Ltwr Mp Rigid -Wall S788 mtd on HMMWV	S01563	39	X	
Trailer-mtd: PP-3102 10kW 50/60Hz M200A1	T39849	Power Plant: Diesel TM 10kW 60Hz AN/NJQ-37	P42262	32	X	
Trailer-mtd: PP-3105 30kW 50/60Hz 2M200A1	T39917	Power Plant: Electric TM 30kW 50/60Hz AN/MJQ-40	P42126	29	X	
Trailer-mtd: PP-3106 60kW 50/60Hz 2M200A1	T93232	Power Plant: Electric TM 60kW 50/60Hz AN/MJQ-41	P42194	9	X	
Trailer-mtd: PU-2101 15kW 50/60Hz M200A1	T40090	Generator Set: DED TM PU-802	G53778	698	X	
Trailer-mtd: PU-2102 30kW 50/60Hz M200A1	T39954	Generator Set: DED TM PU-803	G35851	156	X	
Trailer-mtd: PU-2103 60kW 50/60Hz M200A1	T60034	Generator Set: DED TM 60kW 50/60Hz PU-805 Chassis	G78306	143	X	
Trailer-mtd: PP-3003/15 kW 50/60HZ	T49579	Generator Set: DED TM 15kW 60Hz	G78374	42	X	
Battle Command Transport Networks						
Central Communications: AN/MSC-82	C05022	Battalion Command Post (Switching Group): OM-XXX	B67234	3	X	
Radio Set: AN/PRC-104A	R55200	Radio Set: AN/PRC-150A(C)	R62247	202	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Radio Set: AN/PRC-119F(C)	R83141	Radio Set	R55336	208	X	
Radio Set: AN/PSC-5	R57606	Radio Set: AN/PRC-117F(V)2(C)	R87207	870	X	
Radio Set: AN/VRC-104(V)6 150 Watt W/ PRC-150 HF Radio	R87139	Radio Set: AN/PRC-104A	R55200	51	X	
		Radio Set: AN/VRC-104(V)5	R44706	121	X	
Radio Set: AN/VRC-87F(C)	R67296	Radio Set: AN/VRC-88F(C)	R67330	37	X	
Remote Control Unit KY 100: KY 100 Airterm	R71740	Remote Control Unit: Z-AHP/TEC	R71604	259	X	
Repeater Set Radio: AN/TRC-219	R05004	Antenna: AB-1404/TRC	A81826	1	X	
Speech Security Equipment: TSEC/KY-57	S01373	Ky-99: Minterm	K47623	87	X	
Teleconference System AN/TYQ-122B(V)2	Z05448	Switching Group: Digital Data OA-9511/TYQ	S24749	23	X	
Terminal: Satellite Communication AN/TSC-154	T81733	Satellite Communications Terminal: AN/TSC-93A	S34963	9	X	
Combat Mobility						
Boat: Bridge Erection	B05006	Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	28	X	
Detecting Set: Mine AN/PSS-14C	D05016	Detecting Set Mine: Portable Metallic (AN/PSS-11)	G02341	6	X	
Detecting Set: Mine AN/PSS-14	D03932	Detecting Set Mine: Portable Metallic (AN/PSS-11)	G02341	2,964	X	
Dispensing Set Munition Network Command: Spider M7E1	D05021	Munition: Network Command (SPIDER)	M92387	21	X	
High Mobility Engineer Excavator (HMEE): Type I	H53576	Tractor Wheeled: DSL 4X4 W/Excavator and Front Loader	T34437	3	X	
		Tractor Wheeled: Industrial	T34505	56	X	
Loader Scoop Type: DSL 2-1/2cu yd Hinge Frme w/Multi Purp Bucket	L76556	Loader Scoop Type: 2.5 Cubic Yard	L76897	21	X	
Plow: Mine Clearing	P10842	Plow Mine Clearing for Eng Sqd Vehicle: XM1132	P15852	3	X	
		Straight Obstacle Blade for Eng Sqd Vech: XM1132	S44890	3	X	
Transporter Common Bridge	T91308	Transporter: Common Bridge (CBT) M1977A4	T05067	3	X	
Field Logistics						
Armament Repair Shop Set (ARSS)	A05031	Shop Set Small Arms: Field Maintenance Basic Less Power	W51499	11	X	
Assault Kitchen (AK)	A94943	Kitchen: Company Level Field Feeding	K28601	323	X	
Containerized Kitchen: CK	C27633	Kitchen Field Trailer Mounted: mtd on M103A3 Trailer	L28351	3	X	
Electronic Shop Shelter Mounted Avionics: ANA-146 Less Power	H01907	Electronic Shop Semitrailer Mounted: AN/ASM-189 Less Power	H01855	136	X	
Light Capability Rough Terrain Forklift (LCRTF): 5K	L05010	Truck Lift Fork: Ded 6000 Lb Variable Reach Rt Ammo Hdlg	T48944	60	X	
		Truck Lift Fork: DED 4000 Lb Cap Rough Terrain	T49255	48	X	
		Truck Lift: Fork Variable Reach Rough Terrain	T73347	73	X	
Load Handling Sys (LHS): 2000 Gal Comp Water Tank-Rack (HIPPO)	T32629	Forward Area Water Point Supply System: (FAW SS)	F42612	186	X	
Machinist's Measuring Tool Set (MMTS)	M20190	Tool Kit Machinist: Posts/Camps/Stations	W44512	5	X	
		Tool Kit Welders	W58075	245	X	
Metal Working and Machining Shop Set (MWMSS): Type 1	M05053	Shop Equip Gen Purp Rep Semitrlr Mtd:	T10549	4	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Oscilloscope OS-305()/U:	Z05056	Oscilloscope: OS-303 G (TEMOD)	P32409	141	X	
Oscilloscope Digital Handheld (ODHH)	P43667	Oscilloscope DC-100Mhz: AN/USM-488	P30693	6	X	
Oscilloscope: OS-307/U	Z05259	Oscilloscope DC-100Mhz: AN/USM-488	P30693	257	X	
Shop Equipment Auto Maint and Repair: OM Common No 1 Less Power	W32593	Shop Equipment: Automotive Vehicle	S25885	8	X	
Shop Equipment Machine Shop: FM Basic Less Power	T15644	Shop Equipment Machine Shop: FM Heavy Less Power	T15640	20	X	
Shop Equipment: Automotive Vehicle	S25885	Shop Equipment Automotive Maint and Repair: FM Basic Less Power	T24660	4	X	
		Tool Set Vehicle Full Tracked: Org Maint Suppl No 2 Less Power	W65747	2	X	
Test Set Radio AN/PRM 36	T05038	Radio Test Set: AN/PRM-34()	R93169	270	X	
Test Set Radio Frequency Power: AN/USM-491	T89944	Wattmeter Test Set: TS-3793/U	W39339	45	X	
Test Set: Radar TS-4530A/UPM	T99847	Test Set Transponder: AN/APM-424(V)2	T49460	3	X	
Tool Outfit Hydraulic System: Test and Repair 3/4 ton TM	T30377	Hydraulic Sys Test and Repair Unit (Mx3):	H05002	19	X	
Trailer Tank: Water 400 Gallon 1-1/2 ton 2 Wheel W/E	W98825	Trailer Tank Water (Camel): 800gal 5-ton W/E	T05047	6	X	
Truck Lift Fork: Gas 4000Lb 144 In Lh 68 In Collaps Hgt	X51585	Truck Lift Fork: Dsl Drvn 4000 Lb Cap Rough Terrain	T49255	2	X	
		Truck Lift Fork: Gas Pt 6000 Lb	X51791	2	X	
General Engineering						
Drilling Machine Well: Rotary Truck-mtd 600ft Min	D95754	Water Well Drill Rig: Rotary Trk Mtd 1700 ft Min	W05007	5	X	
Excavator: Hydraulic (HYEX) Type I Multipurpose Crawler Mount	E27792	Excavator: Hydraulic (HYEX) Type III Multipurpose Crawler Mount	E27860	4	X	
		Tractor Full Trckd Low Spd: Dsl Med Dbp W/Buldoz W/Scarif Winch	W76816	29	X	
Hydraulic Electric Pneumatic Petroleum Operate Equip (HEPPOE)	H05004	Pneumatic Tool and Compressor Outfit: 250 Cfm Trlr Mtd	P11866	13	X	
		Tool Outfit Pioneer: Ptbl Hydraulic/Electric Tools Outfit (HETO)	W58486	9	X	
M1158 Truck: Hemtt Based Water Tender	M31997	Distributor Water Tank Type: 6000 Gl Semitrailer-mtd (CCE)	D28318	4	X	
Scraper Earthmoving: 14-18 cu yd	S05029	Scraper Earth Moving Self-Propelled: 14-18 cu yd (CCE)	S56246	55	X	
Tool Kit Pipefitters: 2-1/2 To 4 In Pipe	W48759	Tool Kit Pipefitters: 1/8 To 2 In Pipe	W48622	25	X	
Tractor Full Tracked High Speed: Deployable Lt Engineer (DEUCE)	T76541	Tractor Full Tracked Low Spd: Dsl Med Dbp W/Buldoz W/Scarif Winch	W76816	27	X	
Truck Well Drilling Support	T94171	Water Well Drill Rig: Tender Truck	W05004	5	X	
Type VI Plumbers & Pipefitters Tool Kit (PPTK)	Z05394	Tool Kit Pipefitters: 1/8 To 2 In Pipe	W48622	37	X	
Maneuver Combat Vehicles						
Carrier Armored Command Post: Full Tracked	C11158	Carrier Command Post: Light Tracked	D11538	59	X	
Reconnaissance Vehicle (RV)	R62673	Infantry Carrier: Vehicle (ICV)	J22626	10	X	
Recovery Vehicle Full Tracked: Heavy M88A2	R50885	Recovery Vehicle Full Tracked: Medium	R50681	17	X	
Tank Combat Full Tracked: 120mm Gun M1A2	T13305	Tank Combat Full Tracked: 120mm Gun	T13168	14	X	
Soldier Systems						
Bayonet-Knife: W/Scabbard for M16A1 Rifle	B49272	Bayonet Multipurpose System: XM9	B49004	17,774	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Boresighting Equipment Weapon: Muzzle Alignment	B90494	Boresighting Equipment Weapon: Muzzle Alignment M26	B90426	16	X	
Heavy Weapon Thermal Sight (HWTS): AN/PAS-13(V)3	S90603	Night Vision Sight Crew Served Weapon: AN/TVS-5	N04596	613	X	
Laser: Target Locator Module	L05003	Mini Eyesafe Laser Infrared Observation Set (MELIOS): AN/PVS-6	M74849	210	X	
M205: Machine Gun Tripod	X05002	Mount Tripod Machine Gun: Heavy Caliber 50	M75577	4,700	X	
M25A1: Stabilized Binocular	M05036	Binocular: M25	B67907	426	X	
Maneuverable Canopy 6 (MC 6): Personnel Parachute System	A46878	Parachute Personnel Troop Back: 35 Ft Nom Dia Maneuverable	N67788	264	X	
		Parachute Reserve Personnel Troop Chest: 24 Ft Dia	N68062	405	X	
Night Vision Device: AN/PSQ-20	N07848	Monocular Night Vision Device: AN/PVS-14	M79678	5,184	X	
Night Vision Sight Crew Served Weapon: AN/TVS-5	N04596	Medium Weapon Thermal Sight (MWTS): AN/PAS-13(V)2	S90535	24	X	
Night Vision: Goggle	N05482	Monocular Night Vision Device: AN/PVS-14	M79678	140,693	X	
Parachute Personnel Troop Back: 35 Ft Nom Dia Maneuverable	N67788	T-11: Personnel Parachute System	T91035	94	X	
Parachute Personnel Troop Back: 35 Ft Nom Dia Maneuverable	N68062	T-11: Personnel Parachute System	T91035	106	X	
Sight: Night Vision Sniperscope AN/PVS-10	S90433	Sight Night Vision (SNS): AN/PVS-30	S60342	9	X	
Target Locator Module	T27471	Mini Eyesafe Laser Infrared Observation Set (MELIOS): AN/PVS-6	M74849	329	X	
Soldier Weapons						
Carbine 5.56mm: M4A1	C06935	Rifle: 5.56mm M4	R97234	61,519	X	
		Rifle 5.56mm: M16A2	R95035	81,799	X	
Launcher Grenade: M320A1	L69080	Launcher Grenade 40mm: Single Shot Rifle mtd Detachable W/E	L44595	503	X	
		Launcher Grenade: M203A2	L69012	1,227	X	
Machine Gun 40mm Grenade: MK19 Mod4 Upgunned Weapon Station	M05019	Machine Gun Caliber .50: Hb Flexible (Ground And Vehicle) W/E	L91975	207	X	
		Machine Gun Grenade 40mm: MK19 Mod III	M92362	925	X	
Machine Gun 7.62mm: M240L	M92454	Machine Gun: 7.62mm M240B	M92841	1,030	X	
Machine Gun Caliber .50: Hb Flexible (Ground and Vehicle) W/E	L91975	MK47 Mod 0: Weapon System	M86811	7	X	
Machine Gun Grenade 40mm: MK19 Mod III	M92362	MK47 Mod 0: Weapon System	M86811	149	X	
Machine Gun: Caliber 50	M39331	Machine Gun Caliber .50: Hb Flexible (Ground And Vehicle) W/E	L91975	1,248	X	
Machine Gun: Light 5.56mm M249	M39263	Machine Gun 5.56mm: M249	M09009	1,720	X	
Pistol 9mm Automatic: M9	P98152	Pistol 9 Millimeter: M11	P47365	506	X	
Pistol, Modular : XM-18 Compact	P05042	Pistol 9 Millimeter: M11	P47365	30	X	
Rifle 5.56mm: M16A2	R95035	Rifle: 5.56mm M16A4	R97175	96	X	
Strike						
A3 Bradley Fire Support Team (BFIST): W/Fire Support Sensor System (FS3)	A70576	Armored: Reconnaissance	A40164	39	X	
Fuze Setter	F16879	Fuze Setter: Portable	F17031	183	X	
Radar System: Counter Fire Target Acquisition Radar	R05016	Radar Set: AN/TPQ-37(V)9	A41666	3	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Trailers						
Semitrailer Flatbed: Breakbulk/Container Transporter Commercial 34-ton	S70159	Semitrailer Flat Bed: Breakbulk/Cont Transporter 22-1/2 ton	S70027	862	X	
Semitrailer Tank: 5000 Gal Bulk Haul Self-Load/Unload	S10059	Semitrailer Tank: 5000 Gal Fuel Dispensing Automotive	S73372	61	X	
Trailer Cargo: 1-1/2 ton 2-Wheel	W95811	Trailer Flat Bed: M1082 Trlr Cargo LMTV W/Dropsides	T96564	114	X	
Trailer Cargo: 5-ton Light Engineer Utility Trailer	Z05186	Trailer Flat Bed: M1082 Trlr Cargo LMTV W/Dropsides	T96564	8	X	
Trailer Cargo: MTV W/Dropsides M1095	T95555	Trailer Cargo: 1-1/2 ton 2-Wheel	W95811	36	X	
		Trailer Flatbed: 5 ton 4 Wheel General Purpose	T96883	78	X	
Trailer: Palletized Loading 8X20 M1076	T93761	Trailer Flat Bed: 11 ton 4 Wheel (HEMAT)	T45465	149	X	
Trucks						
Armored Security Vehicle: Wheeled W/Mount (ASV)	A93374	Truck Utility: ECV Armament Carrier W/IAP Armor Ready M1151A1	T34704	151	X	
M-ATV UI W/OGPK:	M05030	Truck Utility: ECV Armament Carrier W/IAP Armor Ready M1151A1	T34704	24	X	
Tractor Line Haul: M915A5	T88858	Truck Tractor: Line Haul C/S 50000 GVWR 6X4 M915	T61103	1,057	X	
Truck Ambulance: 2 Litter Armd W/E (HMMWV)	T38707	Truck Ambulance: 4-Litter Armd 4X4 (HMMWV)	T38844	1	X	
Truck Cargo: 2 1/2 ton 4X4 LMTV W/E W/W LAPES/AD	T42063	Truck Cargo: 4X4 LMTV W/E W/W	T60149	3	X	
Truck Cargo: 5-ton 6X6 MTV W/E LAPES/AD	T41036	Truck Cargo: 4X4 LMTV W/E W/W	T60149	36	X	
		Truck Cargo: LWB Wo/Winch	T93271	2	X	
Truck Cargo: 5-ton 6X6 MTV W/E W/W LAPES/AD	T41104	Truck Cargo: MTV W/E	T61908	1	X	
Truck Cargo: 5-ton WO/Winch	T41515	Truck Cargo: 4X4 LMTV W/E	T60081	49	X	
		Truck Cargo: 4X4 LMTV W/E W/W	T60149	64	X	
Truck Cargo: 5-ton WO/Winch	T41515	Truck Cargo: MTV W/E	T61908	243	X	
Truck Cargo: M977A4	T59532	Truck Cargo: M985A4	T59380	12	X	
Truck Cargo: MTV W/E W/W	T41135	Truck Cargo: MTV LWB W/E W/W	T61772	8	X	
		Truck Cargo: MTV W/E	T61908	199	X	
		Truck Cargo: 4X4 LMTV W/E	T60081	2	X	
		Truck Cargo: 4X4 LMTV W/E W/W	T60149	49	X	
Truck Cargo: Tactical 8X8 HEMMT W/Med Crane	T39586	Truck Cargo: M985A4	T59380	13	X	
Truck Cargo: W/MHE WO/Winch	T59584	Truck Cargo: 4X4 LMTV W/E	T60081	13	X	
Truck Cargo: WO/Winch	T59448	Truck Cargo: 4X4 LMTV W/E	T60081	12	X	
		Truck Cargo: 4X4 LMTV W/E W/W	T60149	34	X	
		Truck Cargo: LWB Wo/Winch	T93271	16	X	
		Truck Cargo: MTV W/E	T61908	4	X	
Truck Dump: 20-ton DED 12 cu yd Cap (CCE)	X44403	Truck Dump: 5 Ton 6X6 W/E	X43708	5	X	
Truck Dump: MTV W/E	T64911	Truck Dump: 10-ton WO/Winch	T65342	5	X	
Truck Dump: MTV W/E W/W	T64979	Truck Dump: 10 ton W/Winch	T65274	3	X	
Truck Materials Handling-Container Hoisting: M1148A1P2	T54516	Truck Cargo: MTV W/E	T61908	6	X	

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Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Truck Palletized (LHS): M1120A4	T55054	Truck Cargo: Tactical HEMTT W/LHS	T96496	90	X	
		Truck Cargo: Tactical HEMTT W/Lt Crane	T59278	17	X	
		Truck: M1120A4 with ECHU	T05061	75	X	
Truck Palletized Loading: M1074A1	T55236	Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10 W/MHE	T41067	78	X	
Truck Tank: WO/Winch	T58318	Truck Tank: Fuel Servicing 2500 Gallon 8X8 Heavy Exp Mob	T87243	31	X	
		Truck Tank: Fuel Servicing 2500 Gallon 8X8 Heavy Exp Mob W/Winch	T58161	6	X	
Truck Tractor: M107A1	T05012	Truck Tractor: Heavy Equipment Transporter (HET)	T59048	58	X	
Truck Tractor: LET 6X6 66000 GVW W/W C/S	T91656	Truck Tractor: (LET)	T60946	15	X	
Truck Tractor: MTV W/E W/W	T61307	Truck Tractor: M1088A1P2 W/Winch	T61375	19	X	
		Truck Tractor: MTV W/E	T61239	87	X	
Truck Tractor: WO/Winch	T88983	Truck Tractor: MTV W/E	T61239	53	X	
Truck Utility ECV TOW/ITAS Carrier with IAPArmor Ready: M1167	T34840	Truck Utility: ECV Armament Carrier W/IAP Armor Ready M1151A1	T34704	80	X	
Truck Utility: Expanded Capacity W/E HMMWV M1113	T61630	Truck Utility Expanded Capacity Enhanced: M1165A1	T56383	367	X	
		Truck Utility Expanded Capacity Enhanced: M1152A1	T37588	225	X	
		Truck Utility: M1152-Expanded Capacity Enhanced	T11588	75	X	
Truck Utility: Heavy Variant HMMWV 10000 GVW W/E	T07679	M-ATV UI W/Crow System	M05029	9	X	
		Truck Utility Expanded Capacity Enhanced: M1165A1	T56383	988	X	
		Truck Utility Expanded Capacity Enhanced: M1152A1	T37588	685	X	
		Truck Utility: M1152-Expanded Capacity Enhanced	T11588	240	X	
Truck Wrecker: M984A4	T63161	Truck Wrecker: Tactical 8X8 HEMTT W/Winch	T63093	77	X	
Truck: Palletized Loading	T81874	Truck Cargo: Heavy PLS Transporter 15-16.5 ton 10X10*	T40999	7	X	
		Truck Cargo: Tactical HEMTT W/LHS	T96496	3	X	
		Truck Cargo: Tactical HEMTT W/Lt Crane	T59278	27	X	
		Truck: 1075A0 with Echu	T05064	1	X	
		Truck: M1075A1 with Echu	T05063	62	X	

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Table 8

Significant Major Item Shortages

NOTE: This table provides a RC top prioritized (PR) shortage list for major equipment items required for wartime missions but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES)	175	11	$2,748,846	$30,237,306	In 2014 HQDA DCS, G-3/5/7 Current and Future Warfighting Capabilities Division (DAMO-CIC) increased the Army Acquisition Objective to purefleet both AC and ARNG Armored Brigade Combat Teams (ABCTs) with modernized M88A2 HERCULES. POM 14-18 and the current POM lack sufficient funding to purefleet ARNG ABCT HERCULES.
2	Joints Effects Targeting Systems (JETS)	1,283	1,283	$280,000	$359,240,000	Joint Effects Targeting System (JETS) addresses the one-man, hand-held precision targeting gap identified by the Fires Center of Excellence (FCOE). JETS is a light-weight, handheld, all weather system that will provide the single dismounted forward observer with a common, enhanced capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets. JETS Target Location Designation System (TLDS) interfaces with existing and future Service Forward Entry Systems (FESs), and will facilitate a reduced targeting time to achieve kinetic effects. The two ARNG Infantry Brigade Combat Teams (IBCTs) have an authorization of 44ea with funding in FY 2020 and fielded in FY 2021. This will allow the two priority IBCTs in FY 2021 to deploy with the most modern precision targeting capability.
3	Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS)	1,078	927	$16,642	$15,427,134	The modern variant is the only available Soldier weapon to bridge the counter defilade capability gap. (However,) the ARNG has only 151 of the older variant in the 19th and 20th SFG, 48th IBCT and 76th IBCT. Starting in FY 2019 the Program Manager PM will field one ARNG S/IBCT per year making the modernization process take 22 years for the ARNG, while AC will be done by FY 2020. With ARNG owning a majority of infantry capability, lack of funding and distribution equity impacts the lethality of the ARNG formations.
4	Semitrailer: Flatbed 34-ton	4,002	1,825	$106,000	$193,450,000	ARNG Equipment On-Hand (EOH) for M872 34-ton Flat Bed is 54%. ARNG owns 55% of the Army's Line Haul Transportation units and has a major shortfall in semitrailers. Existing fleet age is over 20 years and will need modernization in coming years. The ARNG requires funding to procure new semitrailers and finish fielding the existing 34-ton Flat Bed fleet. Not modernizing the fleet will impact support to maneuver forces dependent on line haul for critical supplies and munitions sustaining operations.
5	Next Generation Automatic Test System (NGATS)	34	34	$1,084,000	$53,590,000	NGATS provides diagnostic maintenance support for all variants of the Abrams tank, Bradley fighting vehicle, Paladin artillery system, and Avenger Air Defense system. The current capability of NGATS in ARNG TDA maintenance facilities supporting 5 ARNG ABCTs across 13 split states does not exist. Without these NGATS in maintenance facilities, ARNG ABCTs will not be able to conduct the maintenance mission for critical weapons systems on M1A2 Tanks, M2A3 Bradley fleets and severely impact unit level readiness.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
6	Hydraulic Excavator (HYEX)	224	41	$290,000	$11,890,000	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 is key to bridging operations. Due to CSA Deep Dive decrements, it is projected that AC, which has only 20% of the Operational Engineer Force, will be fielded to 99% of their Army Acquisition Objective (AAO). However, ARNG will only be fielded to 73% of their AAO; with ARNG owning 50% of the operational Engineer Force. This lack of equity places war plans requiring multiple bridging and mobility enhancement missions at high risk of failure. Conditional Materiel Release granted Sep 2018.
7	Distribution Systems, Fuel & Water	2,783	1,400	varies	$236,043,056	Tank Rack Module (TRM) & Load Handling System Compatible Water Tank Rack (HIPPO) systems provide increased fuel and water capability while simultaneously decreasing the personnel requirements of legacy systems. Both systems are Critical Dual Use that significantly add to the modularity of distribution operations. The Modular Fuel System - Tank Rack Module: ARNG has received 289 of the 1,478 required systems as of August 23, 2018. HIPPO: The ARNG has received 470 of the 1,305 required systems as of August 23, 2018.
8	Truck: Heavy Expanded Mobility Tactical Truck (HEMTT) Wrecker, M984A4	676	435	$491,382	$213,751,170	Funding for the M984A4 ends after FY 2020, 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 63% of its modernization requirement by the end of FY 2019. This 11-ton wrecker is capable of recovering other HEMTT vehicles as well as medium and light tactical wheeled vehicles.
9	The Transportable Tactical Command Communications (T2C2)	184	93	varies	$31,776,000	The Transportable Tactical Command Communications (T2C2) system and the Commercial Coalition Equipment (CCE) are a critical dual use capability that will not be fully fielded to the National Guard. The T2C2 system is a lighter more expeditionary capability that will replace the aging satellite dish in the Army's inventory. These can be rapidly deployed in support of operational needs in austere environments. Similarly the CCE, which was designed to enable voice and data collaboration between U.S. and coalition forces. The shortfalls of 42 T2C2 (L) and 51 T2C2 (H), reflect the CSA's deep dive cuts for POM 20-24.

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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	Calibration Sets, Secondary Transfer Standards	77*	516	varies	$25,486,800	The Calibration Set, Secondary Transfer Standards (T05045, T05046, and C72669) are the primary Metrology (calibration) set in the ARNG for both the tactical and regional Test, Measurement, and Diagnostic Equipment (TMDE) support missions. These sets certify that TMDE used to make measurements during weapon system maintenance are accurate and traceable to national standards. The current modernization efforts are to replace the Multifunction Calibrator, Reference Signal Generator, and current coil and torque calibration hardware. These instruments support TMDE used on radio systems, Abrams, Bradley, Fire Finder, Gray Eagle, HIMARS, MLRS, Shadow, C-RAM, and Rotary Wing Aircraft. All of these weapons systems stand the risk of reduced readiness rates if the calibration instruments are not replaced. Current Army funding will not complete full replacement until FY 2024. *NOTE: These items are component items of prime equipment systems, hence the difference in shortage versus requirements.
11	All Terrain Crane, Type II	91	91	$1,450,000	$47,850,000	The All Terrain Crane, Type II provides the Horizontal, Clearance, and Multirole Bridge Companies with the heavy lift and long reach capabilities needed to support the Maneuver Brigade Combat Team (BCT). The Type II All Terrain Heavy Crane was decremented across the Future Year Defense Program resulting in all (45) Army National Guard Vertical Engineer Construction Companies losing the capability needed to support the Maneuver BCTs. 35 states and territories will be affected with Michigan, Louisiana, North Carolina, and Puerto Rico impacted the most. Active Army will have met 100% of their requirement while Army National Guard will have met 50% of theirs. The 25-ton Crane does not meet the capability gap that the All Terrain Crane (60 Tons) does.

III. Army Reserve Overview

A. Current Status of the Army Reserve

1. General Operational Overview

Top Army Reserve Focus Areas

- Pursue predictable funding & balanced resource prioritization to mitigate future readiness risk & enhance the ability to win in contested environments
- Emphasize concurrent modernization of critical enabler capabilities required for global power projection in support of Multi-Domain Operations
- Influence policy decisions to provide more accurate methods of assessing equipment modernization & readiness posture

The United States Army Reserve is comprised of over 200,000 Soldiers and Civilians operating in every state, 5 U.S. territories, and 30 countries. The Army Reserve accounts for 20 percent of the Army's organized units, provides nearly half of the Army's total maneuver support and makes up a quarter of the Army's mobilization base expansion capability. Critical capabilities include early opening and set-the-theater units required to rapidly deploy forces, build expeditionary combat power, and sustain a campaign-capable force. Based on the current operational environment and the challenge of full-spectrum warfare, America's Army Reserve focuses on training, manning, and equipping formations in order to deploy critical enabling capabilities within days or weeks.

Although the Army Reserve remains a relevant and skilled force, modernization and life cycle sustainment of critical equipment within its formations is imperative to achieve readiness goals. The Army Reserve must be equipped with platforms and systems capable of global deployment and seamless integration in support of the full range of combat scenarios. However, the enabler-centric Army Reserve is not well positioned to compete for resources based on fiscal realities and the current Army prioritization model.

a. The Army Reserve as an Operational Force

In an environment in which the rapid mobilization & deployment of lead formations is critical to massing & sustaining combat power, the Army relies on the…unique capabilities of America's Army Reserve to fight & win.
- LTG Charles D. Luckey, Chief of Army Reserve & Commanding General, U.S. Army Reserve

The Army is undergoing a transformation that involves capabilities and capacities required to fight and win on a complex battlefield against peer competitors, regional adversaries and non-state actors. This will require predictable and balanced resourcing for equipment modernization to meet readiness objectives. As an enabler-centric force, the Army Reserve must remain compatible with the total Army and fully capable of providing sustainment functions. As the threat environment drives increased force requirements, the Army Reserve must remain postured to provide units of action capable of meeting compressed mobilization time horizons. Unpredictable funding and rapid technological advancements continue to produce equipping prioritization results that place the preponderance of Army Reserve units on a tiered modernization path. Our strategy is to concentrate equipping priorities on Focused Readiness (Ready Force X) units identified as early entry and theater opening forces most critical to setting the conditions for combat operations. Other Army Reserve units will remain sized, trained, and postured to provide operational and strategic depth for the full scope of contingency missions. Rapidly generating and deploying capable units requires the most

modern equipment available to close compatibility gaps and ensure the same level of survivability, lethality, mobility, and network connectivity as the joint force they are fighting alongside.

b. Homeland Defense (HD) and Defense Support of Civil Authorities (DSCA)

Section 12304a of Title 10 U. S. Code allows state governments and federal agencies to request the assistance of the Army Reserve in response to emergency situations. Civilian enhanced military skills and unique capabilities are resident in more than 1,100 communities throughout the United States. The HD/DSCA mission is a perfect fit for the Army Reserve's immediate response authority, permitting actions required to save lives, prevent suffering, and mitigate property damage.

Readiness and availability of Critical-Dual Use (CDU) equipment is essential to afford immediate response. The Army Reserve CDU equipment on-hand (EOH) status including substitutes is 92 percent, with a shortfall exceeding $1 billion. *Table 2-16* highlights the top CDU equipment shortage values by capability.

Table 2-16. Army Reserve Top CDU Shortages

Capability	Equipment Type	Shortage Value
Logistics	Load Handling System (LHS) 2000 Gal Tank (HIPPO)	$56M
Engineering	Heavy Crane (50 Ton)	$94M
Transportation	Semitrailer Flatbed: Breakbulk/Container Transporter 34 Ton	$36M
Engineering	Bridge Erection Boat (BEB)	$105M
Engineering	Common Bridge Transporter M1977A4	$83M

In 2018, the Army Reserve responded to DSCA missions in California, Hawaii, and American Samoa, providing personnel, equipment, and facilities support to include:

- Emergency Preparedness Liaison Officers in support of the Mount Kilauea eruption in Hawaii.
- Engineer support for debris removal in the wake of wildfires in northern California.
- Personnel support, 100,000 gallons of potable water, logistics handling equipment, utility vehicles, and use of a facility to house the FEMA Incident Management Assistance Team in response to tropical storm Gita in American Samoa.

2. Status of Equipment

> *We cannot expect success fighting tomorrow's conflicts with yesterday's thinking, yesterday's weapons, or yesterday's equipment.*
>
> ***- Honorable James N. Mattis, Secretary of Defense***

The Army data presented in Chart 1-2 of Chapter 1 depicts an Army Reserve equipment shortage of $5.5 billion. The FY 2016 reported shortfall of $10.1 billion indicates the Army Reserve closed a $4.6 billion equipment shortage gap over the last five years. Base budget allocations of $2.1 billion over the same period suggest equipment modernization is not the primary reason for

improvement. A principle driver is the application of policy and business rules associated with the Army's shift to a tiered modernization strategy and inventory based management system to include:

- The practice of forgoing documentation of validated equipment requirements in advance. This is a product of the speed of technology and requirements approval process continuing to outpace funding levels. Delayed documentation creates information and data voids, making it difficult to accurately project modernization gaps and capture resource shortfalls.
- Simplifying the definition of modern equipment to coincide with items documented. This broad way of defining modernization inhibits measurable standards to determine readiness or the ability of units to deploy and integrate with organic equipment.

a. Equipment On-hand (EOH)

Army Reserve EOH is 75 percent excluding substitute items and 95 percent with authorized substitutions. The Army Reserve's mission essential equipment on hand is 82 percent, creating capability gaps crucial to theater opening and early entry teams. The Army Reserve's EOH posture is artificially high, due in part to ongoing force structure changes, incremental documentation of new equipment authorizations, pending redistribution of excess, and accelerated divestment of legacy systems. Limited investments for enabler capabilities and reliance on cascaded legacy equipment to fill Army Reserve shortages is expected to continue for the foreseeable future.

The Army Reserve's rate of divestment as compared to its rate of receipt of new/cascaded equipment is on a negative glide slope. In FY 2018, the Army Reserve divested over 88,000 pieces of equipment. Although the Reserve Components generally obtain new equipment each year through service appropriations and dedicated procurement programs, the primary source of equipment is increasingly achieved through redistribution of in-service legacy systems.

Equipment divestment rates increase as legacy equipment is identified as obsolete or becomes a cost burden to maintain in the inventory. Insufficient equipment investment impacts Army Reserve equipment on hand, which impacts Army Reserve equipment readiness. Aging equipment demands greater maintenance funding to address the extended operation of fleets past economic useful life for enabler platforms bordering on obsolescence.

b. Average Age of Major Items of Equipment

The average age of the Army Reserve's equipment is 24 years, a result of receiving redistributed legacy equipment approaching the end of its useful life. Nearly all of the equipment identified in *Table 2-17* is beyond its economic useful life.

Table 2-17. Army Reserve Top Legacy Equipment

Nomenclature	Line Item Number	Average Age (years)	Economic Useful Life (years)
Armored Vehicle Launched Bridge	L43664	40	25–30
M113A3 Armored Personnel Carrier	C18234	34	25–30
Semitrailer Flatbed 34-Ton	S70159	30	17–25
Trailer Tank Bulk Petroleum 7.5K	S73119	27	17–25
Heavy Dump Truck 20-Ton	X44403	25	20–25
Bridge Erection Boat	B25476	21	20–25

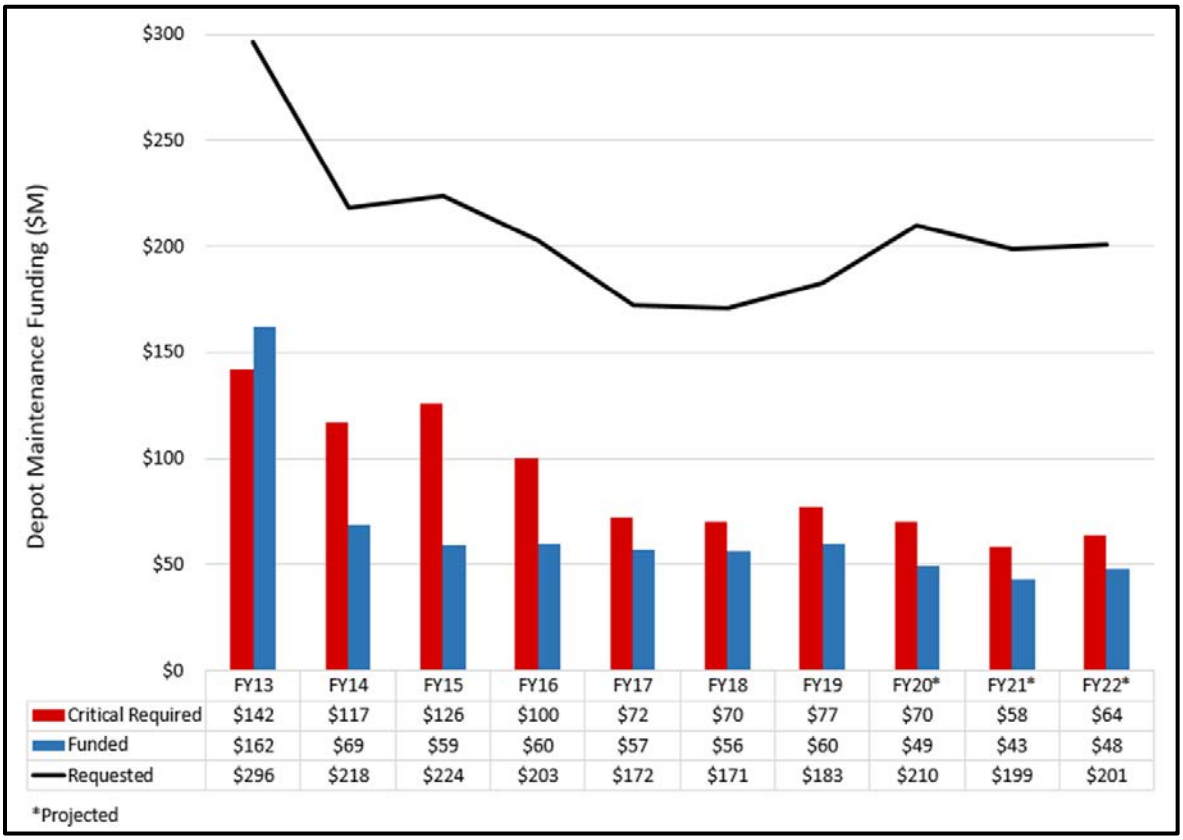
Consistent with private industry fleet management principles, older Army equipment systems have higher failure rates, leading to increased maintenance demands and stress upon operational readiness. Therefore, sustained resourcing for incremental modernization is required to achieve readiness objectives.

c. Maintenance

Army Reserve depot maintenance service life extension programs are critical to sustain the readiness levels required of an operational force. As depicted in *Figure 2-1*, maintenance funding over the last five years declined and is projected to remain flat through FY 2022. From 2001 to 2013, Army Reserve maintenance funding averaged $110 million. Since 2014, funding allocations were reduced to just $60 million per year. The result is funding for 70–80 percent of command critical requirements and a backlog of equipment induction into the depot maintenance program.

Overall maintenance funding for FY 2020 is reduced by 18 percent over FY 2019 levels, which will impact equipment readiness during an era when the Army Reserve is expected to maintain legacy fleets on a longer time horizon. In FY 2019, all Army equipment returning from deployments will no longer receive Overseas Contingency Operations funding for maintenance. Equipment returning from overseas will be considered an unfunded requirement, with the resource burden placed on each component to accomplish with year of execution funds. In FY 2021 and FY 2022, depot maintenance funding improves as a percentage of the critical requirements.

Figure 2-1 Army Reserve Depot Maintenance (Requested vs. Funded)



	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20*	FY21*	FY22*
Critical Required	$142	$117	$126	$100	$72	$70	$77	$70	$58	$64
Funded	$162	$69	$59	$60	$57	$56	$60	$49	$43	$48
Requested	$296	$218	$224	$203	$172	$171	$183	$210	$199	$201

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

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, particularly within the Joint Logistics Enterprise, is crucial for full integration of Army Reserve capabilities. 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 is transitioning to a more agile acquisition process aimed at providing greater flexibility to take advantage of technological advancements in preparation for potential conflicts with peer competitors. As such, investment priorities are focused on development of the "big six" programs that include: long-range precision fires, next-generation combat vehicle, future vertical lift family of helicopters, air and missile defense, soldier lethality and the network. In this emerging environment, the Army will not modernize all formations at the same rate. Enabler force structure will remain disproportionately affected within the resource prioritization model and reliant on cascaded legacy equipment to fill shortages.

The Army definition for modern equipment includes any item captured on a unit's authorization document. This broad description does not provide well-defined standards to delineate

capabilities based on tangible metrics for connectivity, survivability, lethality, mobility, or battlefield sustainability and invites operational risk. Short of enacting business rules to differentiate equipment capable of global deployment to the full spectrum of threat environments, the Army Reserve modernization levels will appear high by placing greater emphasis on quantity over quality.

3. Transparency

The Army Reserve supports Army efforts to improve post appropriation transparency business processes with focus on adjusted component splits based on enacted funding and continued development of Item Unique Identification to track equipment procurements to unit delivery. However, further work remains to fully address the requirement for end-to-end transparency that includes the planning, programming, and budgeting processes prior to submission of the President's Budget. The Army Reserve remains committed to supporting improvements that deliver strategic flexibility and achieve the following desired outcomes.

- Automated data collection for tracking delivery quantities to appropriations by fiscal year.
- Development of an auditable system within the centrally managed budget and procurement processes that authoritatively identifies fund execution for RC equipment.
- Establishment of reliable funding splits, and improved visibility of fielding plan adjustments.
- Ability to account for funding and quantities programmed, but not received.

4. Army Reserve Equipping Strategy

Our goal remains to equip an operational Reserve compatible and interoperable with joint forces and to ensure Army Reserve Soldiers are prepared at all times to deploy and perform any mission assigned. The Army Reserve remains committed to focusing on the following lines of effort that align with the Secretary and Chief of Staff of the Army guidance: restoring readiness, building capacity and improving lethality, and improving efficiencies through policy and business reforms.

The Army Reserve equipment strategy remains representative of Army priorities that match current funding levels. The Army's equipping strategy is to selectively modernize and build new only by exception. The Army Reserve prioritizes available resources to enhance readiness of priority units, providing joint forces with critical capabilities and capacity necessary for contingency response. In the near term, our focus remains on equipping early deploying formations, which consist of units prepared for deployment and required within the first 0 to 90 days. This construct rationalizes equipping and modernization strategies across lines of effort to improve connectivity, survivability, lethality, and mobility.

5. Equipping Successes

Procurement of the new armor capable M1977A4 Common Bridge Transporter is an example of an extremely successful modernization program for the Army Reserve. Utilization of National Guard Reserve Equipment Appropriation (NGREA) to accelerate modernization, the Army Reserve procured 280 systems to outfit five of nine Multi-Role Bridge Companies (MRBCs) designated as Focused Readiness Units. The investment enabled replacement of legacy

M1977A0 models that had exceeded economic useful life, saving sustainment funding to support other high priority equipment.

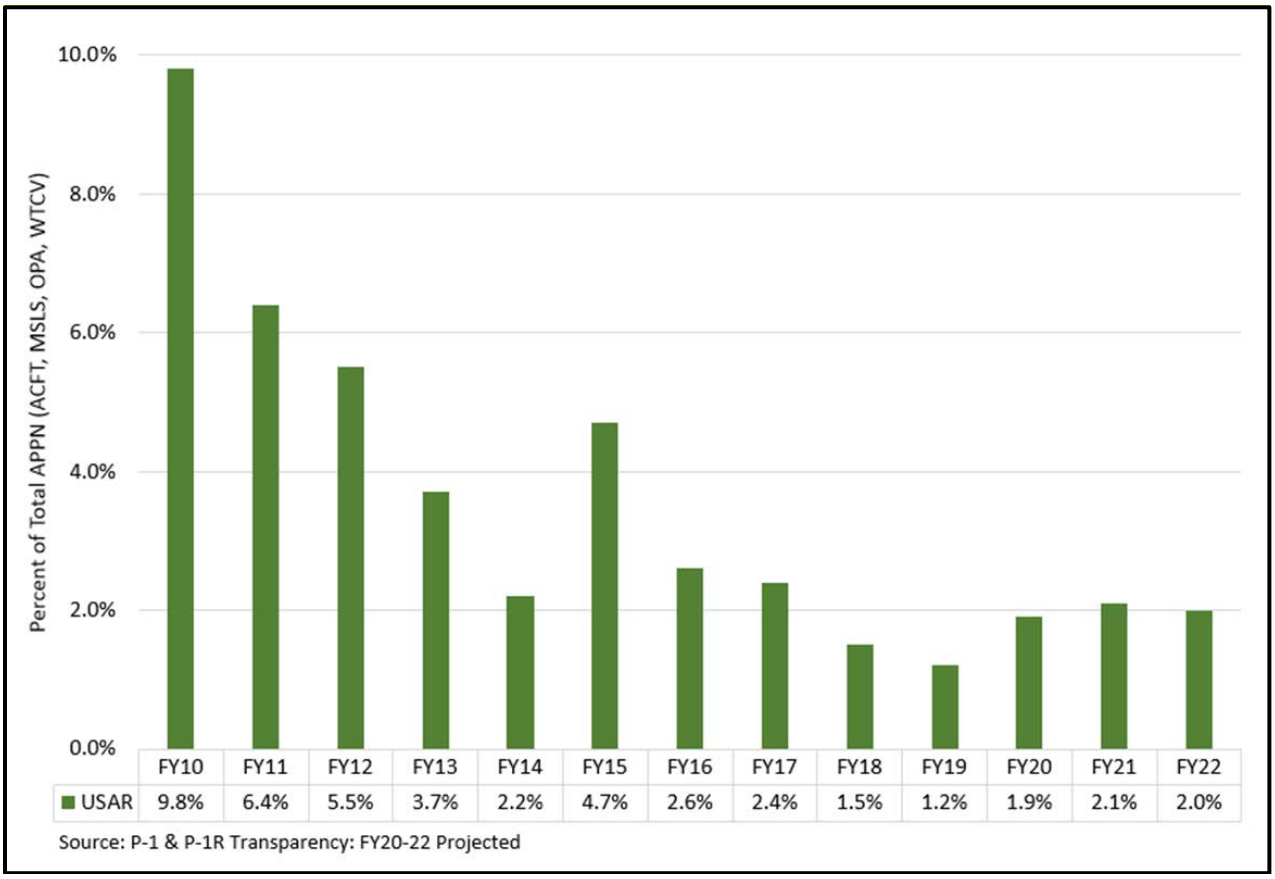
B. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

a. Base Budget

Sustaining the readiness of Army Reserve capabilities requires consistent and predictable funding. However, difficult resource decisions have forced tough choices in accepting near-term risk in enabler systems to support development of higher priority programs. Since 2013 over 470 programs have been terminated, delayed, or restructured, which disproportionally affects modernization efforts for enabler-centric structure. Figure 2-2 depicts the Army Reserve portion of the base budget profile for FY 2010–FY 2022. During the peak funding years of FY 2010–FY 2012, Army Reserve averaged 7.2 percent of the base budget. Since enactment of the Budget Control Act (BCA) in FY 2013, the Army Reserve portion of the base budget has declined to less than 3 percent annually with a projected FY 2020–FY 2022 outlook of approximately 2 percent. The budgetary outlook reflects the shift to a tiered modernization strategy that will slow investments for enabler systems, while increasing the reliance on redistribution of assets and sustainment funding for legacy fleets.

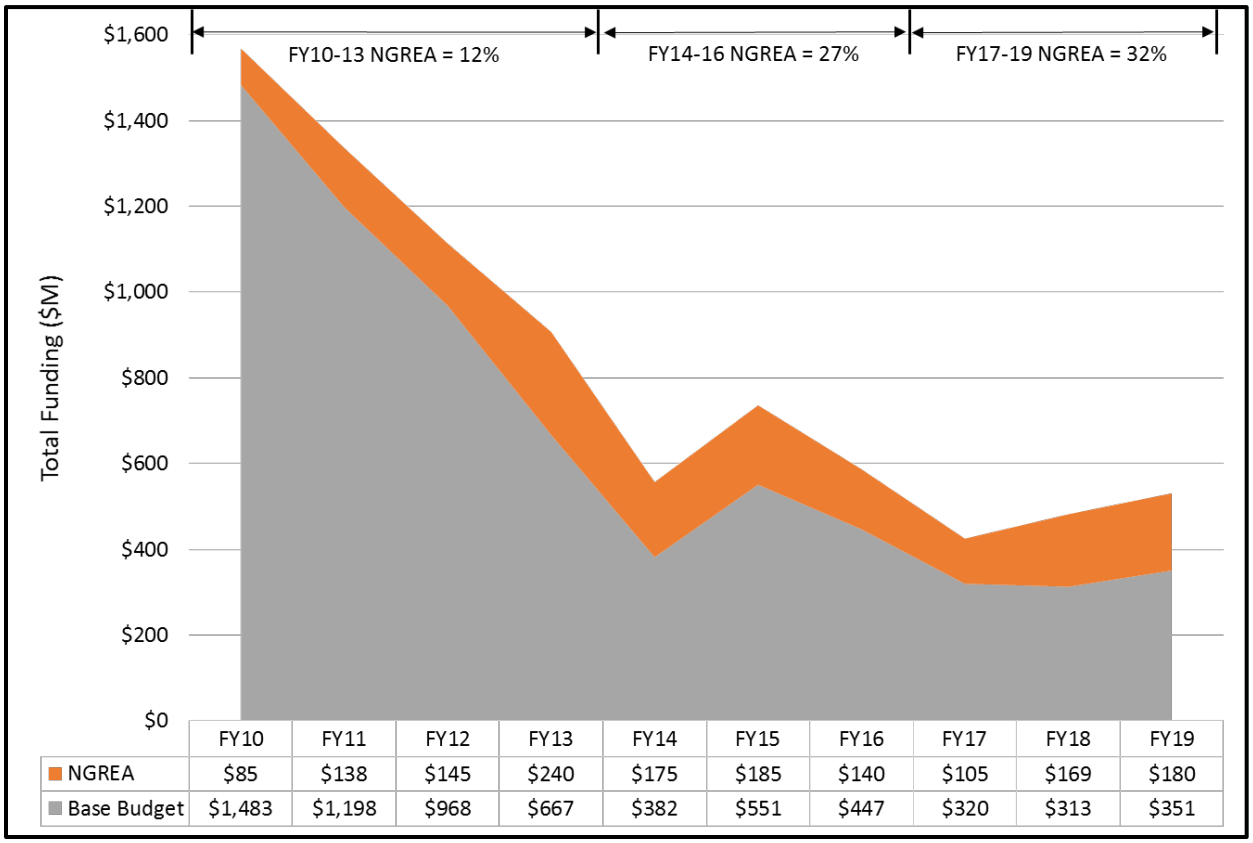
Figure 2-2. Army Reserve Equipment Procurement Trend (Base Budget)



b. National Guard and Reserve Equipment Appropriation (NGREA)

NGREA funding allows for investment in newer systems not prioritized or programmed for the Army Reserve in the base procurement budget. *Figure 2-3* provides a comparison between base and above base funding, depicting the impact of NGREA resources. NGREA allocations from FY 2010–FY 2013 represented 12 percent of the total Army Reserve procurement funding, increasing to 27 percent for FY 2014–FY2016 funding. The FY 2016–FY 2018 total NGREA of $414 million provided investments of $19.3 million in Mission Command Systems; $57.1 million in Engineering equipment; $86.5 million in Field Logistics; $8.3 million in Tactical Power; $191.4 million in Tactical Wheeled Vehicles; $21 million in Force Protection equipment; and $29 million in Simulators with the remainder dispersed amongst other items. NGREA for FY 2017–FY 2019 accounts for 32 percent of the total equipment budget allocated to the Army Reserve.

Figure 2-3. Army Reserve Base vs NGREA Funding



	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
NGREA	$85	$138	$145	$240	$175	$185	$140	$105	$169	$180
Base Budget	$1,483	$1,198	$968	$667	$382	$551	$447	$320	$313	$351

1. Anticipated Transfers from Active Component (AC) to Reserve Component (RC)

Table 5 Projected Equipment Transfer/Withdrawal Quantities reflects planned equipment transfers from the AC to the RC from FY 2020–FY 2022.

2. Anticipated Withdrawals from Army Reserve Inventory

Currently, there are no pending transfers captured under DoDI 1225.06.

3. Equipment Shortages and Modernization Shortfalls

Army Reserve equipment shortages and modernization shortfalls are based on data derived from the Army's 1M end strength force structure analysis. The following portfolio funding narratives highlight the Army Reserve's equipment shortages and resource shortfalls. Army business rules do not allow for advance documentation of validated equipping requirements prior to resourcing and fielding. The embedded data tables include both documented and validated Basis of Issue Plans requirements.

a. Aviation Portfolio

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

Investments in New Procurement and Modernization: The Army Reserve is reliant on base funding for aircraft procurement and modernization programs. Base funding for CH-47F procurement in FY 2018 was removed due to receipt of cascaded equipment. The remaining base funding for aviation platforms is in FY 2022 for Blackhawk upgrades. FY 2019–FY 2021 funding is focused on ground support equipment and C-12 fixed-wing aircraft upgrades (see *Table 2-18*).

Table 2-18. Aviation Procurement Funding

Funding Source	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Base Budget (P-1R)	$15.8M	$33.5M	$27.5M	$27.2M*	$20.5M*	$56.5M*

* Projected

The Army Reserve's top critical documented shortages within the Aviation Portfolio are listed in *Table 2-19*.

Table 2-19. Aviation Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2022 On-Hand Projected	Unfunded Requirement
HH-60M Black Hawk MEDEVAC*	60	29	31	29	$510M
C-12 Airplane*	32	30	2	30	$16M

* CDU Equipment

Aviation Focal Points:

- The Army Reserve 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. These models are expected to be modernized to UH-60V models beginning in FY 2022. There is no projected new procurement of H-60M platforms through FY 2024.

- The Future Utility Aircraft (FUA) is anticipated to replace legacy C-12 airframes, which is an average 25 years of age. Recent resource decisions have delayed FUA production beyond FY 2024.

b. Mission Command Portfolio

The Mission Command portfolio consists of four capability areas—transport, applications, enablers, and integration—that facilitate joint interoperability. The rate of technology advancement is outpacing the ability of the Army to resource modern systems evenly across the total force. The Army Reserve is multiple generations behind in the most modern mission command systems, creating communication compatibility gaps with the Total Force. The Army Reserve continues to work with Headquarters Department of the Army (HQDA) in order to sufficiently prioritize units within fielding plans to achieve battlefield commonality. It is difficult to discern the portfolio funding outlook due to fiscal constraints driving 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 (see *Table 2-20*).

Table 2-20. Mission Command Procurement Funding

Funding Source	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Base Budget (P-1R)	$143M	$95M	$98M	$95M*	$91M*	$81M*

* Projected

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 with the replacement of obsolete equipment.
- Approximately 90 percent of Army Reserve mounted mission command systems are considered legacy systems with degraded capabilities. The Army investment strategy accelerates procurement to address legacy system network compatibility challenges by FY 2019 and seeks complete modernization by FY 2023.
- Actual fielding quantities by component, by 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 Army Reserve. The portfolio consists of motor transport and watercraft platforms. The Army Reserve provides over 50 percent of total Army watercraft and 43 percent of motor transport units, comprising light, medium, and heavy Tactical Wheeled Vehicles (TWV).

Investments in New Procurement and Modernization: In FY 2017 and FY 2018, base budget funding ($63 million) accounted for 37 percent of total TWV portfolio investments ($172 million), while NGREA funding ($109 million) allowed the Army Reserve to fill unfunded modernization gaps across the fleet. Base budget funding in FY 2020 through FY 2022 reflects increased investment in trailer and Medium Tactical Vehicle modernization along with

an initial investment in Joint Light Tactical Vehicle (JLTV) production. FY 2020 funding was reduced by $150 million from the last report because JLTV funding was shifted to FY 2023.

Table 2-21. Tactical Wheeled Vehicles Procurement Funding

Funding Source	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Base Budget (P-1R)	$39M	$24M	$29M	$47M*	$80M*	$42M*
NGREA Investment	$47M*	$62M*				

* 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 Army Reserve has utilized NGREA funding to exceed the 50 percent armor capable goal with most fleets at or above 70 percent. Delayed investments in new procurement and recapitalization programs will increase sustainment costs required to maintain readiness levels of the legacy TWV fleet and risk interoperability with the Total Force. Top unfunded shortfalls are listed in *Table 2-22*.

Table 2-22. Tactical Wheeled Vehicles Top Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2022 On-Hand Projected	Unfunded Requirement
Joint Light Tactical Vehicle (JLTV)	14,687	0	14,687	2,553	$4.1B
M915A5*	2,414	985	1429	985	$500M
Heavy Dump Truck – 20 Ton*	357	0	357	21	$67M

* Critical Dual Use Equipment

Transportation Focal Points:

- The current Army Reserve JLTV fleet will remain high mobility multipurpose wheeled vehicle (HMMWV)-centric and approximately 36 percent armor-capable through at least FY 2021, when the Army Reserve is projected to begin JLTV fielding in greater quantities. The Army Reserve will have 17 percent of the current JLTV requirement on-hand by the close of FY 2022.
- Production of the armor-capable M915A5 Line-Haul Tractor ceased prior to fulfilling Army Reserve fleet shortages and modernization requirements. There is no plan to restart production of this critical theater opening capability until FY 2032, leaving only 41 percent of the total Army Reserve line haul fleet capable of global deployment to a non-permissive threat environment.
- The Heavy Dump Truck (20 ton) investment strategy is limited to modernizing approximately 6 percent (21 of 357) of the total Army Reserve legacy fleet to an armor-capable variant by FY 2022. The Army is exploring options to replace remaining fleet that is at or beyond economic useful life.

d. Mobility and Engineering Portfolio

The Army Reserve 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 2017 and FY 2018, the Army's base budget procurement funding ($131 million) accounts for 74 percent of the total Mobility portfolio investments ($177 million) with NGREA funding ($46 million) filling critical funding gaps. Increased funding in FY 2019–FY 2022 ($555 million) reflects investments in Army Reserve combat mobility systems, particularly counter explosive hazard enablers and bridging equipment (see *Table 2-23*).

Table 2-23. Mobility Procurement Funding

Procurement Source	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Base Budget (P-1R)	$51M	$80M	$130M	$113M*	$118M*	$194M*
NGREA Investment	$18M*	$28M*				

* Projected

The Army's near to mid-term base budget strategy remains focused on resetting and modernizing engineer capabilities resident in Brigade Combat Teams and assumes greater risk in EAB enabler equipment acquisition. Extending procurement timelines for mission essential Mobility equipment is directly impacting Army Reserve readiness posture by placing a greater burden on maintaining less optimal legacy platforms well beyond their economical useful life 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 2022 On-Hand Projected	Unfunded Requirement
Joint Assault Bridge (JAB)*	96	0	96	0	$554M
Common Bridge Transport (CBT)*	504	280	224	280	$83M
Bridge Erection Boat (BEB)*	126	9	117	104	$20M
Heavy Crane (50 Ton)	75	0	75	16	$94M

* CDU Equipment

Mobility and Engineering Focal Points:

- The Joint Assault Bridge replaces the legacy 60-year old Armored Vehicle Assault Bridge platform. Proposed funding in FY 2019 through 2021 was shifted to FY 2022 and beyond resulting in no systems fielded before FY 2023. Potential Force Design Update may adjust the Army Reserve requirement downward beginning FY 2021.
- Base budget and NGREA funding enabled the Army Reserve to modernize five of nine MRBCs with Common Bridge Transporters in FY 2017 and FY 2018. No additional base funding to modernize remaining systems is currently projected through FY 2023.

- Base funding between FY 2018 and FY 2022 will modernize 83 percent of the legacy Bridge Erection Boats in the Army Reserve inventory. This will modernize seven of nine MRBCs with boats.
- Current funding procures 21 percent of total Heavy Crane requirement through FY 2022.

e. Field Logistics Portfolio

The portfolio comprises maintenance, medical, bulk supply, and liquid logistics capabilities, the majority of which are CDU items. Over 50 percent of the Army's capacity for Field Logistics resides in the Army Reserve. Unique capabilities include 92 percent of the Total Army's bulk petroleum support, 88 percent of general supply, 49 percent of water storage/distribution, and 59 percent of medical capabilities.

Investments in New Procurement and Modernization: FY 2017–FY 2018 Army base budget procurement funding ($74 million) accounted for 55 percent of total Field Logistics portfolio investments ($135 million), with NGREA funding ($61 million) accounting for the remaining 45 percent. FY 2018–FY 2022 base funding is primarily aimed at 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. Field Logistics Procurement Funding

Procurement Source	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Base Budget (P-1R)*	$36M	$38M	$29M	$40M*	$27M*	$27M*
NGREA Investment	$19M*	$42M*				

* Projected

The Field Logistics portfolio continues to be on a minimum sustainment funding rate, as it has since enactment of the BCA. Significant challenges impacting readiness and interoperability include shortages and modernization gaps within petroleum delivery and storage capabilities. The lack of investment to modernize liquid logistic platforms at the EAB level degrades 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 towards 'pull' distribution, which slows advancing tactical movement and adversely affects combat lethality. Top equipment modernization shortages are listed in *Table 2-26*.

Table2-26. Field Logistics Critical Equipment Shortages

Capability	Required	On-Hand	Shortage	FY 2022 On-Hand Projected	Unfunded Requirement
Mobile Tactical Retail Refueling System (MTRRS)	813	0	813	93	$40M
Fuel Trailer 7.5k – M1062P1*	480	0	480	0	$60M
Water Tank – 2000 Gal (HIPPO)*	490	47	443	142	$56M
Rough Terrain Forklift – 5K*	1,016	447	569	635	$40M

* CDU Equipment

Field Logistics Focal Points:

- Investments in the 2,000 gallon Load Handling System-Compatible Water Tank Rack System (HIPPO) and Rough Terrain Forklift are delayed due to follow-on contract implementation and limited resources. The fielding time horizon for both systems will extend well beyond FY 2026. Current funding projections procure only 29 percent of HIPPO and 63 percent of the Rough Terrain Forklift through FY 2022.
- The Army does not have a current funded strategy to replace the legacy 7,500 gallon bulk fuel trailer which is beyond economic useful life. The Army Reserve owns 100 percent of the requirement for this critical Theater Opening capability.
- Tactical Fuel Distribution Systems are not funded through FY 2024. Failure to modernize the 5,000 legacy tactical fuel M969 tankers could result in distribution challenges.

Medical Focal Points:

- The Combat Support Hospital (CSH) continues its transition to the Field Hospital Force Design Update requiring equipped and modernized Regional Training Sites to sustain medical readiness through collective training opportunities.
- Based on the Army equipping strategy for medical equipment, only 4 of the 16 248-bed Army Reserve CSHs are equipped based on the Army fielding strategy for medical equipment.
- Risk is mitigated through the fielding of minimal hospital sets maintained at three Regional Training Sites-Medical (RTS-MED). These RTS-MED sites support all of 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 Chemical, Biological, Radiological, Nuclear, and High-yield Explosives 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 2017–FY 2018 Army base budget procurement funding ($79.5 million) accounts for 84 percent of the total Force Protection and Soldier portfolio investments ($95 million), with NGREA funding ($15.5 million) accounting for the remaining 16 percent. The FY 2017–FY 2022 base budget funding primarily reflects investments in modernization of 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 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Force Protection Base Budget (P-1R)	$11M	$5.5M	$7M	$3.5M*	$3M*	$7.5M*
Soldier Base Budget (P1-R)	$34M	$29M	$25M	$20.5M	$0	$167K
Soldier NGREA Investment	$500K*	$15M*				

* Projected

Limited funding for force protection modernization programs increases the risk in biological detection and protection capabilities required to provide responsive support for HD and DSCA missions and limits abilities to bolster force protection posture. The Army Reserve'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 2022 On-Hand Projected	Unfunded Requirement
Rifle 5.56mm: M4A1	124,147	31,511	92,636	101,501	$16M
Chemical/Biological Protective Shelter (CBPS)*	97	6	97	70	$49M

* CDU Items

Force Protection and Soldier Focal Points:

- 62 percent of current on-hand carbines are obsolete M16 models identified for divestment. Potential funding issues with sustainment dollars and vendor production delays could potentially delay the pure fleet strategy beyond FY 2023. However, the current Army plan is funded and projected to be pure fleet by 4th QTR FY 2022.
- The Chemical/Biological Protective Shelter is a CDU item that provides a mobile, self-contained, rapidly deployable system for both chemical and medical units to conduct environmentally controlled operations. The Army is looking at adjusting the requirement from 97 to 86 shelters. Current projections have the Army Reserve receiving 72 percent (70 of 86) of the current requirement through FY 2022 with no additional planned procurement.

C. Summary

For more than a century, the Army Reserve has brought decisive capabilities to the battlefield, playing an integral role as a force provider for the most lethal land power in the world. Globally engaged for more than 17 consecutive years of war, the Army Reserve has been, and continues to be, an essential element of the Total Army and the Joint Force, meeting high operational tempo demands and providing predictable operating and generating forces to combatant commands as required. Currently serving in 20 time zones, across the globe and around the clock, the sun never sets on America's Army Reserve. The United States Army Reserve must remain capable of mobilizing rapidly and deploying with the connectivity, survivability, lethality, and mobility needed to win on the battlefield. Quickly generating and deploying units of action requires the most capable and modern equipment—to close interoperability gaps in areas such as battlefield communications and mission command systems—in order to ensure that units are ready to deploy rapidly without extended post mobilization train-up. The Army Reserve requires predictable and sustained funding for modernization to ensure timely delivery of equipment necessary to build and retain readiness, our number one priority.

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. FY 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Air Defense							
Center: Communications Operations	C18033	$3,748,800	5	5	5	5	5
Radio Set: AN/USQ-140(V)2(C)	R42399	$307,318	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	36	24	24	24	24
Helicopter Utility: UH-60L	H32361	$16,967,644	84	76	76	76	84
MEDEVAC Helicopter: HH-60M	M33458	$16,967,644	29	29	29	29	60
Small Unmanned Aircraft System: Raven B	S83835	$21,889	47	47	47	47	103
Utility Cargo Aircraft: UC-35A	U05004	$20,000	8	8	8	8	16
Aviation							
Air Traffic Control Central: AN/TSW-7A	A27624	$5,789,000	2	2	2	2	2
Battle Damage Assessment and Repair Sys: BDAR	B85617	$110,000	12	12	12	12	16
CH-47 Crashworthy Extended Range Fuel	C22759	$595,000	12	8	8	8	8
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	17	16	16	16	16
Radar Set: AN/TPN-31	R17126	$3,701,502	2	2	2	2	2
UH-60 External Stores Subsystem (ESSS)	E21985	$676,111	10	10	10	10	120
Battle Command Command and Control (C2)							
Command System Tactical	C40996	$1,011,652	6	6	6	6	14
Battlespace Awareness							
Central: Communications AN/TSQ-226(V)2	C43331	$2,056,822	0	0	0	0	4
Detecting System Countermeasures: AN/MLQ-40(V)4	D04182	$1,997,000	7	7	7	7	16
Digital Topographic System: AN/TYQ-67(V)	D10281	$1,053,000	5	5	5	5	5
Ground Station Tactical Intelligence: AN/TSQ-179	T37036	$4,644,000	0	0	0	0	4
Battle Command Transport							
Antenna: BB-1404/TRC	A81826	$1,066,695	20	20	20	20	36
Central Office: Telephone Automatic	C20617	$4,081,375	10	10	10	10	12
Joint Node Network (JNN) Central Office Telephone Auto	J05001	$2,472,271	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	120	120	120	120	170
Radio Terminal: Line of Sight Multi-channel AN/TRC-190F(V)3	R90587	$2,472,271	55	55	55	55	76
Satellite Communication System: AN/TSC-156	S23268	$4,000,000	24	24	24	24	36
Teleconference System: AN/TYQ-122	T43146	$2,472,271	38	38	38	38	48

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Terminal: Satellite Communication AN/TSC-155	T81733	$4,411,733	6	6	6	6	13
Combat Mobility							
Anti-Personnel Mine Clearing System: Remote Control (M160)	A05002	$553,783	10	10	10	10	24
Boat Bridge Erection Inboard Engine: Shallow Draft	B25476	$224,258	112	112	112	112	112
Boat: Bridge Erection	B05006	$826,128	0	0	0	0	14
Bridge Armored Veh Launched Scissors: 63-ft (AVLB) MLC 70	B31098	$7,645,450	41	41	41	41	96
Bridge Heavy Dry: Supt (HDSB) 40M MLC96	B26007	$1,869,741	36	36	36	36	36
High Mobility Engineer Excavator (HMEE) Type I	H53576	$405,500	126	126	126	126	189
Interior Bay Bridge Floating	K97376	$435,703	269	269	269	269	270
Launch M60 Series Tank Chass Trnsptg: 40 & 60 ft Bridge Ty CL60	L43664	$4,641,558	96	96	96	96	96
Launcher Heavy Dry Support Bridge (HDSB)	L67660	$10,631,000	36	36	36	36	36
Loader Scoop Type: 2.5 Cubic Yard	L76897	$150,000	31	31	31	31	31
Loader Scoop Type: DSL 2-1/2 cu-yd Hinge Frame w/Multipurpose Bucket	L76556	$141,500	2	2	2	2	22
Loader Scoop Type: Heavy Type II Loader	L15041	$250,000	61	61	61	61	78
Loader Skid Steer: Type III	L77147	$53,548	154	154	154	154	154
Loader Skid Steer: Type III	L77215	$328,201	310	310	310	310	310
Medium Flail	M05031	$664,971	24	24	24	24	24
Mine Protected Clearance Vehicle	M05004	$1,451,707	72	72	72	72	72
Ramp Bay Bridge Floating	R10527	$525,068	108	108	108	108	108
Tractor Wheeled: DSL 4X4 w/Excavator & Front Loader	T34437	$328,201	2	2	2	2	18
Tractor Wheeled: Industrial	T34505	$328,201	166	166	166	166	166
Transporter Common Bridge	T91308	$280,613	276	276	276	276	504
Vehicle Mounted Mine Detection (VMMD) System	V05001	$2,828,522	144	144	144	144	144
Field Logistics							
Assault Kitchen	A94943	$65,000	101	101	101	101	156
Force Provider Module: Houses 550 Soldiers Transportable	F28973	$4,650,000	1	1	1	1	6
Forward: Repair System (FRS)	F64544	$285,591	207	207	207	207	207
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	575	574	577	577	582
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	0	0	0	0	38
Petroleum Quality Analysis System: Enhanced	P25743	$1,770,000	21	21	21	21	21
Rough Terrain Container Handler: Kalmar RT240	R16611	$868,103	326	326	326	326	381
Shower: Portable 12 Head	S62898	$1,200,000	124	124	124	124	132
Tactical Water Purification System (TWPS) 1500 gph	T14017	$455,871	32	32	32	32	40
Trailer Tank Water (Camel): 800 gal 5-ton W/E	T05047	$106,532	1	1	1	1	1
Trailer Tank Water: 400-gal 1.5-ton 2-wheel	W98825	$85,825	982	982	982	982	1,530
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	350	350	350	350

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
CBRN Dismounted Reconnaissance: (SKO)	C05051	$1,071,000	26	26	26	26	32
Chemical-Biological Protective Shelter (CBPS): M8	C07506	$1,635,636	1	1	1	1	20
JBAIDS Augumentation Set:	J05007	$500,000	2	2	2	2	40
Mask Chemical-Biological: M45	M12736	$466	1,396	1,286	1,286	1,286	1,286
Mask Chem-Bio Joint Service General Purpose: Field M50	M12986	$400	89,864	89,864	89,864	89,864	137,761
Mask Chem-Bio Joint Service General Purpose: Combat Vehicle Crewman M51	M13236	$400	2,542	2,542	2,542	2,542	4,133
Nuclear Biological Chemical Recon Vehicle (NBCRV)	N96543	$8,024,127	56	56	56	56	64
General Engineering							
All Terrain Crane Type II: (Heavy)	Z05089	$1,625,875	0	0	0	0	35
Crane Wheel-mtd: Hydraulic Light 7.5-ton w/Cab	C36151	$165,922	23	23	23	23	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	86	86	86	86	86
Excavator: Hydraulic Type I Multipurpose Crawler Mount	E27792	$348,371	61	61	61	61	138
Hydraulic Electric Pneumatic Petroleum Operated Equip (HEPPOE)	H05004	$230,000	193	193	193	193	229
M1158 Truck: HEMTT Based Water Tender	M31997	$668,953	42	42	42	42	42
Motorized Grader	M05001	$277,000	149	149	149	149	149
Paving Machine: Bituminous Material	P05023	$2,773,125	6	6	6	6	6
Scraper Earth Moving Self-Propelled: 14-18 Cu Yd (CCE)	S56246	$668,031	7	7	7	7	7
Scraper Earthmoving: 14-18 Cu Yd	S05029	$796,100	140	140	140	140	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	$316,096	117	117	117	117	117
Tractor FT LS: T-5 Type II W/Ripper	T05026	$199,262	12	12	12	12	12
Tractor FT HS: Armored Combat Earthmover (ACE)	W76473	$887,050	64	64	64	64	64
Tractor FT HS: Deployable LT Engineer (Deuce)	T76541	$398,000	9	9	9	9	12
Tractor Full Tracked Low Speed: T5	T05029	$188,638	12	12	12	12	12
Tractor Full Tracked Low Speed: T9	T05015	$316,096	225	225	227	228	228
Truck: Tactical Firefighting 8X8 Hvy Exp Mov	T82180	$878,461	68	68	68	68	70
Maneuver							
Carrier Armored Command Post: Full Tracked	C11158	$1,011,652	25	25	25	25	25
Carrier Command Post: Light Tracked	D11538	$1,011,652	22	22	22	22	22
Carrier Personnel Full Tracked: Armored (RISE)	C18234	$511,343	336	336	336	336	336
Recovery Vehicle Full Tracked: Medium	R50681	$3,593,524	47	47	47	47	47
Medical							
Computerized Tomography Scanner Field	C79284	$749,275	0	0	0	0	28
Dental Materiel Set Oral: Maxillofacial Surgery	D65925	$335,526	0	0	0	0	13
Medical Materiel Set Central Materiel Service	M08417	$855,010	14	14	14	14	37
Medical Materiel Set Maxo-Facialhead Neck Surg Augmentation	M09098	$401,072	5	5	5	5	6
Medical Materiel Set Medical Supply: 164 Bed CSH Co	M14585	$450,000	0	0	0	0	24
Medical Materiel Set Neurosurgery Augmentation: DEPMEDS	M48305	$211,674	5	5	5	5	6

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Medical Materiel Set Pharmacy: 84 Bed CSH Co	M73254	$152,915	2	2	2	2	16
Medical Materiel Set Post-Op/ICU Ward	M09576	$331,047	21	21	21	21	66
Medical Materiel Set Radiology Computerized Tomography	M09826	$908,000	4	4	4	4	28
Medical Materiel Set Triage/Emergency/Pre-Op	M73050	$440,645	24	24	24	24	24
MES Forward Surgical Team:	M45375	$402,331	22	22	22	22	22
Soldier Systems							
Armament Subsystem: Remotely Operated	A90594	$236,751	313	313	313	313	948
Mini Eyesafe Laser IR Observation Set (MELIOS): AN/PVS-7	M74849	$43,128	110	110	110	110	126
Soldier Weapons							
Carbine 5.56mm: M4A1	C06935	$1,772	30,394	30,394	30,394	30,394	122,232
Command Launch Unit: (Javelin) 13305405-119	C60750	$243,732	90	90	90	90	90
Launcher Grenade: M320A1	L69080	$4,876	5,589	5,589	5,589	5,589	7,529
Machine Gun 5.56mm: M249	M09009	$4,298	11,401	11,306	11,376	11,441	11,441
Machine Gun: 7.62mm M240L	M92454	$14,404	168	168	168	168	168
Machine Gun 7.62mm: M240H	M92591	$11,597	288	236	236	236	236
Machine Gun Caliber .50: HB Flexible (Ground & Vehicle) W/E	L91975	$11,005	64	64	64	64	64
Machine Gun: Caliber .50 Heavy Fixed Turret Type	L91701	$15,259	278	278	278	278	510
Machine Gun Grenade 40mm: MK19 Mod III	M92362	$17,085	1,814	1,749	1,760	1,774	1,774
Machine Gun: 7.62mm M240B	M92841	$14,404	6,799	6,799	6,799	6,799	7,405
Machine Gun: Caliber .50	M39331	$15,000	3,090	3,090	3,090	3,090	5,161
Machine Gun: Light 5.56mm M249	M39263	$4,298	2,497	2,497	2,497	2,497	3,222
Pistol 9mm: M11	P47365	$426	493	493	493	493	731
Pistol 9mm Automatic: M9	P98152	$426	23,718	23,045	23,020	23,026	23,026
Strike							
Command and Control System: AN/TSQ-284 (HCCC)	C05019	$8,807,000	4	4	4	4	5
Crane Barge: 89 to 250 ton	F36090	$8,000,104	2	2	2	2	3
Trailers							
Light Tactical Trailer: 3/4 ton	T95992	$27,859	5,274	5,224	5,240	5,261	5,261
Palletized Load System: Trailer-CTE	P05025	$109,794	205	205	205	205	376
Semitrailer Flatbed: Breakbulk/Container Transporter 34-ton	S70159	$105,069	829	829	829	829	1,720
Semitrailer Low Bed: 25-ton 4-wheel W/E	S70517	$179,778	94	94	94	94	94
Semitrailer Low Bed: 40-ton 6-wheel W/E	S70594	$104,444	689	689	689	689	880
Semitrailer Low Bed: 70-ton HET	S70859	$610,664	480	480	480	480	480
Semitrailer Tank: 5000-gal Bulk Haul Self-Load/Unload	S10059	$146,093	1,041	1,041	1,041	1,041	1,320
Semitrailer Tank: 5K gal Fuel Dispensing Automotive W/E	S73372	$198,020	433	433	433	433	433
Semitrailer Tank: Petroleum 7500-gal Bulk Haul	S73119	$198,020	399	399	399	399	480
Semitrailer Van: Supply 12-ton 4-wheel W/E	S75175	$84,466	58	58	58	58	59
Semitrailer: Tank	S11084	$90,610	82	82	82	82	0
Trailer Bolster: General Purpose 4-ton 4-wheel W/E	W94536	$9,618	195	195	195	195	196
Trailer Cargo: 1-1/2 ton 2-wheel W/E	W95811	$50,433	0	0	0	0	82
Trailer Cargo: High Mobility 1-1/4 ton	T95924	$9,615	2,198	2,198	2,198	2,198	2,405

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Trailer Cargo: MTV W/Dropsides M1095	T95555	$50,433	2,320	2,320	2,320	2,320	2,371
Trailer Flat Bed: M1082 Trailer Cargo LMTV W/Dropsides	T96564	$38,200	1,600	1,599	1,613	1,616	1,616
Trailer: Flat Bed	T64618	$55,875	0	0	0	0	84
Trailer: Palletized Loading 8X20	T93761	$88,639	3,020	3,017	3,016	3,016	3,016
Trucks							
Armored Security Vehicle (ASV): Wheeled	A93374	$1,019,000	409	409	409	409	510
Tractor Line Haul: M915A5	T88858	$212,000	961	985	985	985	1,141
Truck Ambulance: 4-Litter Armored HMMWV	T38844	$397,000	462	462	462	462	462
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	$255,951	2,638	2,638	2,638	2,638	2,835
Truck Cargo: LWB WO/Winch	T93271	$255,952	214	214	214	2,147	214
Truck Cargo: M985A4	T59380	$342,365	93	93	93	93	114
Truck Cargo: Tactical 8X8 HEMTT w/LHS	T96496	$367,575	66	66	66	66	66
Truck Cargo: WO/Winch	T59448	$157,982	1,713	1,713	1,713	1,713	1,733
Truck Dump FMTV: 10-ton	T65047	$242,585	0	0	0	0	6
Truck Dump: 10-ton W/Winch	T65274	$383,786	87	87	87	87	87
Truck Dump: 10-ton WO/Winch	T65342	$242,585	514	514	514	514	514
Truck Dump: 20-ton DED 12 cu-yd Cap (CCE)	X44403	$211,764	228	228	228	228	357
Truck Materials Handling-Container Hoisting: M1148A1P2	T54516	$899,231	0	0	0	0	84
Truck Palletized (LHS): M1120A4	T55054	$364,415	735	734	733	737	737
Truck Tank: Fuel Servicing 2500-gal 8X8 HEMTT	T87243	$499,182	86	86	86	86	113
Truck Tank: WO/Winch	T58318	$499,182	274	259	259	259	259
Truck Tractor: M107A1	T05012	$461,970	288	288	288	288	288
Truck Tractor: LET	T60946	$319,009	890	890	890	890	890
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	$461,970	122	122	122	122	192
Truck Tractor: LET 6X6 66000 GVW W/W C/S	T91656	$250,614	12	12	13	13	13
Truck Tractor: Line Haul C/S 50000 M915	T61103	$212,000	1,380	1,380	1,380	1,380	1,380
Truck Tractor: MTV W/E	T61239	$242,669	368	368	368	368	368
Truck Tractor: WO/Winch	T88983	$242,669	767	767	767	767	767
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	1,289	1,273	1,273	1,273	1,273
Truck Utility Expanded Capacity Enhanced: M1152A1	T37588	$153,760	1,582	1,534	1,534	1,534	1,534
Truck Utility: ECV Armament Carrier - Armor Ready M1151A1	T34704	$129,376	4,093	4,093	4,093	4,093	4,093
Truck Utility: Heavy Variant HMMWV 10000 GVW W/E	T07679	$153,760	8,197	8,213	8,387	8,437	8,437
Truck Van: M1079A1P2 WO/Winch	T62359	$232,284	163	163	163	163	163
Truck Wrecker	T94671	$690,707	142	142	143	143	146
Truck Wrecker: M984A4	T63161	$886,000	363	362	362	363	363
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
Truck: Palletized Loading System (PLS)	T81874	$418,000	732	732	732	732	732

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Watercraft							
Landing Craft Mechanized: 69-ft	L36739	$174,650	8	8	8	8	8
Landing Craft Mechanized: Mod2	L36654	$1,700,000	1	1	1	1	1
Landing Craft Utility: RORO 245 to 300 ft	L36989	$5,000,000	4	4	4	4	6
Tug: Large Coastal and Inland Waterway Diesel	T68330	$12,500,000	2	2	2	2	3
Tug: Small 900 Class	T68398	$3,600,000	6	6	6	6	6
Vessel Logistic Support: 245 to 300 ft length	V00426	$11,033,333	2	2	2	2	3

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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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
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	L43664	40	
Loader Scoop Type: DSL 2-1/2 cu-yd-Hinge Frame w/Multipurpose Bucket	L76556	33	
Ramp Bay Bridge Floating	R10527	9	
Tractor Wheeled: DSL 4x4 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			
Excavator: Hydraulic Type I Multipurpose Crawler	E27792	23	
Tractor Full Tracked (FT) HS, Deployable LT Engineer (Deuce)	T76541	19	
Crane Wheel-mtd: Hydraulic Light 7.5-ton w/Cab	C36151	28	
Maneuver Combat Vehicles			
Carrier Armored Command Post: Full Tracked	C11158	33	
Carrier Personnel Full Tracked: Armored (Rise)	C18234	34	
Trailers			
Trailer Cargo: High Mobility 1-1/4 ton	T95924	10	
Semitrailer Tank: 5000-gal Bulk Self-Load/Unload	S10059	26	
Semitrailer Flatbed: Breakbulk/Container 34-ton	S70159	30	
Semitrailer Low Bed: 25-ton 4-wheel W/E	S70517	49	
Semitrailer Low Bed: 40-ton 6-wheel W/E	S70594	27	
Semitrailer Low Bed: 70-ton HET	S70859	21	
Semitrailer Tank: Petroleum 7500-gal Bulk Haul	S73119	27	
Trucks			
Truck Ambulance: 4-Litter Armored HMMWV	T38844	16	
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	

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Table 2

Average Age of Equipment

Nomenclature	Equip No.	Average Age	Remarks
Truck Tank: Fuel Servicing 2500-gal 8X8 Heavy Expanded Mob	T87243	23	
Truck Tractor: MTV W/E	T61239	17	
Trucker Wrecker: Tactical 8X8 Heavy Expanded Mobility w/Winch	T63093	20	
Watercraft			
Landing Craft Mechanized: 69-ft	L36739	18	
Landing Craft Utility: RORO 245 to 300 ft	L36989	26	
Tug: Small 900 Class	T68398	19	
Vessel Logistic Support: 245 to 300 ft	V00426	31	

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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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2018 would be expected to arrive in RC inventories in FY 2019 or FY 2020. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
Engineer Command and Control (C2) Reconnaissance & Survey System	$1,625,000		
Logistics Automation Systems	$250,000		
Command Post Shelter	450,000		
Mobile Communication System	280,000		
Tactical Radio Platform (Dual AC/DC)	170,000		
Satellite Communications (SATCOM) System	600,000		
Tactical Networking System	800,000		
Hand Held Mine Detection	800,000		
Mobile Power Tool Set	700,000		
Engineer Rapid Airfield Construction Capability	1,500,000		
Bridge Erection Boat	5,400,000		
High Mobility Engineer Excavator (HMEE)	1,290,000		
T-9 Dozer	1,390,000		
Scraper	4,000,000		
Urban Operations Platoon Support Equipment	510,000		
Urban Operations Squad Support Equipment	700,000		
Vertical Skills Construction Kit	1,120,000		
Assault Craft (15 Man)	380,000		
Assault Craft Boat Motors	600,000		
Truck Lift Fork: 5K Rough Terrain	7,350,000		
Mobile Tactical Retail Refueling System	1,700,000		
Load Handling System: 2000G Water	4,200,000		
Maintenance Support Device V3	5,325,000		
Test Set Aviators Night Vision Imaging System	126,000		
Light Tactical Vehicle Modernization	19,800,000		
Palletized Loading System	7,600,000		
HEMTT Modernization	10,920,000		
HEMTT Load Handling System	3,300,000		
Medium Tactical Truck	2,475,000		
Medium Utility Trailer	500,000		
Light Utility Trailer	400,000		
Heavy Equipment Trailer	500,000		
Survey Vehicle	1,500,000		
Fuel Efficient/Clean Power Generators	320,000		
Power Distribution Systems	700,000		

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Environmental Control Unit	30,000		
M4A1 Carbine	489,000		
Modular Small Arms Range (MSAR)	6,000,000		
Common Driver Trainer	6,700,000		
Unstabilized Gunnery Trainer	2,000,000		
Transportation Reserve	500,000		
FY 2018 NGREA Equipment			
Command and Control Systems		$650,000	
Logistics Automation Systems		250,000	
Tactical Radio Platform		170,000	
Tactical Networking System		800,000	
Satellite Communications (SATCOM) System		2,700,000	
Engineer Rapid Airfield Construction Capability		450,000	
Bridge Erection Boat		6,300,000	
Dry Gap Bridge		1,350,000	
Heavy Crane		6,250,000	
Mobile Power Tool Set		700,000	
High Mobility Engineer Excavator (HMEE)		1,290,000	
T-9 Dozer		1,668,000	
Scraper		7,200,000	
Vertical Skills Construction Kit		2,800,000	
Assault Craft		152,000	
Assault Craft Motors		240,000	
Truck Lift Fork		4,875,000	
Mobile Tactical Retail Refueling System		3,400,000	
Modular Fuel System Tank Rack Module		2,000,000	
Bulk Fuel Distribution System		1,350,000	
Load Handling System: 2000G Water (HIPPO)		2,800,000	
Water Production and Storage		2,000,000	
Expeditionary Shower Unit		950,000	
Field Laundry System		170,000	
Logistics Support Area Package		130,000	
Lighting Equipment Kit		25,000	
Pressurized Storage Units		75,000	
Medical Support Equipment		11,250,000	
Medical Equipment Sets		10,000,000	
Maintenance Support Device		3,000,000	
Light Tactical Vehicle Modernization (JLTVs and HMMWVs)		14,850,000	
Palletized Loading System		3,800,000	
HEMTT Modernization		11,200,000	
HEMTT Load Handling System		5,250,000	

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Modular Catastrophic Recovery System		1,700,000	
Truck Tractor - Yard		3,000,000	
Medium Tactical Truck		5,500,000	
Medium Utility Trailer		11,000,000	
Light Utility Trailer		6,125,000	
Fuel Efficient/Clean Power Generators		1,600,000	
Power Distribution Systems		3,500,000	
Environmental Control Unit		300,000	
M4A1 Carbine		10,000,000	
Gunner Protection Kits		1,750,000	
Protective Shelters		3,200,000	
Modular Small Arms Range (MSAR)		6,000,000	
Common Driver Trainer		2,345,000	
Marksmanship Trainer		755,000	
Maintenance Trainer		30,000	
Unstabilized Gunnery Trainer		1,600,000	
Transportation Reserve		500,000	
FY 2019 NGREA Equipment			
Command and Control Systems			$11,700,000
Tactical Radio Platform			240,000
Tactical Networking System			1,600,000
Satellite Communications (SATCOM) System			3,000,000
Tactical Digital Media			2,700,000
First Responder Communication System			1,000,000
Hydraulic, Electric, Pneumatic, Petroleum Operated Equipment (HEPPOE)			2,300,000
Heavy Crane			7,500,000
High Mobility Engineer Excavator (HMEE)			1,300,000
T-9 Dozer			1,080,000
Scraper			6,400,000
Vertical Skills Construction Kit			7,000,000
Assault Craft			80,000
Assault Craft Motors			120,000
Truck Lift Fork			4,500,000
Mobile Tactical Retail Refueling System			3,400,000
Modular Fuel System Tank Rack Module			2,000,000
Load Handling System: 2000G Water (HIPPO)			7,000,000
Water Production and Storage			2,000,000
Expeditionary Shower Unit			800,000
Field Laundry System			200,000
Logistics Support Area Package			260,000
Lighting Equipment Kit			40,000

Table 4

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Pressurized Storage Units			30,000
Bulk Fuel Distribution System			1,680,000
Medical Support Equipment			9,000,000
Medical Equipment Sets			7,250,000
Maintenance Support Device			3,500,000
Light Tactical Vehicle Modernization (JLTVs and HMMWVs)			13,200,000
Gunner Protection Kits			700,000
Palletized Loading System			1,900,000
HEMTT Modernization			8,000,000
HEMTT Load Handling System			3,000,000
Heavy Dump Truck			12,500,000
Truck Tractor - Yard			600,000
Medium Tactical Truck			8,800,000
Medium Utility Trailer			10,000,000
Light Utility Trailer			1,400,000
Fuel Efficient/Clean Power Generators			2,400,000
Power Distribution Systems			3,500,000
Environmental Control Unit			150,000
M4A1 Carbine			10,000,000
Tactical Shelters			750,000
Individual Tactical Equipment			2,000,000
Upturned Exhaust Systems			900,000
Modular Small Arms Range (MSAR)			7,000,000
Marksmanship Trainer			4,000,000
Medical Simulation			1,000,000
Maintenance Trainer			20,000
Transportation Reserve			500,000
Total	**$105,000,000**	**$169,000,000**	**$180,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Aircraft					
CH-47F Improved Cargo helicopter	C15172	-8			
Helicopter Utility: UH-60L	H32361	-8			
Aviation					
Power Unit Auxiliary: Aviation Multi-Output GTED (AGPU)	P44627	-1			
Trailers					
Trailer Flat Bed: M1082 TRLR Cargo LMTV w/ Dropsides	T96564	-1	+14	+3	
Trucks					
Tractor Line Haul: M915A5	T88858	+24			
Truck Palletized (LHS): M1120a4	T55054	-1	-1	+4	
Truck Wrecker:	T94671		+1		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Aircraft							
CH-47F Improved Cargo Helicopter	C15172	+18	n/d				
Small Unmanned Aircraft System: Raven B	S83835	+1	n/d				
Aviation							
Warning Receiver System Countermeasure	W55180	+7	n/d				
Battle Command C2							
BTUH 60000 Environmental Control Unit: HD-1240/G	B29108	+242	n/d				
Computer Set, Digital: AN/UYK-128	C18378	+1,123	n/d				
Computer System: Digital AN/UYQ-90(V)3	C78851	+74	n/d				
LTT Trailer-mtd: PU-2002 10kW 50/60Hz	L84622	+5	n/d				
Panel Power Distr: 60Hz 400-amp	P60558	+40	n/d				
Trailer-mtd: PU-2101 15kW 50/60Hz M200A1	T40090	+24	n/d				
Army Human Resources Workstation (AHRW)	Z39781	+28	n/d				
Battlespace Awareness							
Digital Topographic System: AN/TYQ-67(V)	D10281	+4	n/d				
Data Analysis Central: AN/MSW-24	D77801	+2	n/d				
Battle Command Transport Networks							
Battalion Command Post Switching Group	B67234	+3	n/d				
Radio Set: AN/VRC-89F(C)	R44999	+98	n/d				
Radio Set: AN/VRC-92F(C)	R45543	+649	n/d				
Radio Set	R55336	+65	n/d				
Radio Set: AN/PSC-5	R57606	+132	n/d				
Radio Set: AN/VRC-88F(C)	R67330	+11	n/d				
Radio Set: AN/VRC-90F(C)	R68044	+2,579	n/d				
Radio Set: AN/VRC-91F(C)	R68146	+124	n/d				
Radio Set: AN/PRC-119F(C)	R83141	+1	n/d				
Satellite Communication System: AN/TSC-156	S23268	+1	n/d				
Satellite Communication Terminal: AN/TSC-154	T81733	+2	n/d				
Radio Set: Hand-held Radio	Z01320	+1,741	n/d				
Combat Mobility							
Detecting Set: Mine AN/PSS-14	D03932	+112	n/d				
Loader Skid Steer: Type III	L77215	+15	n/d				

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Mine Resistant Vehicle	M74226	+12	n/d				
Field Logistics							
Fuel System Supply Point: FSSP Type 4 300K	F04966	+2	n/d				
Electronic Shop Shelter-mtd Avionics: AN/ASM-146	H01907	+59	n/d				
Hydraulic System Test and Repair Unit (MX3)	H05002	+23	n/d				
Hoseline Outfit Fuel Handling: 4-in Diameter Hose	K54707	+14	n/d				
Laundry Advanced System (LADS): Trailer-mtd	L70538	+7	n/d				
Rough Terrain Container Handler (RTCH): Kalmar RT240	R16611	+28	n/d				
Food Sanitation Center	S33399	+36	n/d				
Load Handling System (LHS) Compatible, 2000-gal Water Tank Rack (HIPPO)	T32629	+8	n/d				
Truck Tractor: Yard 46000 GVW 4X2	T60353	+10	n/d				
Truck Lift: Fork Variable Reach Rough Terrain	T73347	+64	n/d				
Water Purification: Reverse Osmosis 3000-gph Trailer-mtd	W47225	+8	n/d				
Trailer Tank: Water 400-gal 1.5-ton 2-wheel W/E	W98825	+1	n/d				
Force Protection							
Mask Chemical-Biological Joint Service General Purpose: Field M50	M12986	+129	n/d				
NBC Reconnaissance Vehicle (NBCRV)	N96543	+31	n/d				
Radiac Set: AN/PDR-75A	R30925	+226	n/d				
General Engineering							
Comp Unit Rty: Air Trailer-mtd DED 250-cfm 100-psi	E72804	+2	n/d				
Mixer Concrete Module: PLS 2600-gal	M81382	+2	n/d				
Scraper Elevating: Self-propelled 8-11 cu yd Non-Sectionalized	S29971	+1	n/d				
Tractor FT High-speed: Deployable Lt Engineer (DEUCE)	T76541	+3	n/d				
Maneuver Systems							
Drivers Enhancers: AN/VAS-5	D41659	+651	n/d				
Medical Field Systems							
Computer Set: Digital AN/TYQ-106(V)1	C18345	+222	n/d				
Soldier Systems							
Night Vision Goggle	N05482	+7,445	n/d				
Soldier Weapons							
Launcher Grenade: M320A1	L69080	+1,757	n/d				
Support Systems							
Platform: Container Roll-in/Roll-out	B83002	+2,801	n/d				

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FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Trailers							
Semitrailer Tank: 5000-gal Bulk Haul Self-Load/Unload W/E	S10059	+3	n/d				
Semitrailer Tank: Petroleum 7500-gal Bulk Haul	S73119	+33	n/d				
Trailer: Palletized Loading 8X20	T93761	+59	n/d				
Trailer Cargo: MTV W/Dropsides M1095	T95555	+135	n/d				
Trailer Cargo: High Mobility 1-1/4 ton	T95924	+108	n/d				
Trucks							
Armored Security Vehicle: Wheeled w/Mount	A93374	+30	n/d				
Truck Utility: ECV Armament Carrier w/IAP Armor-ready M1151A1	T34704	+168	n/d				
Truck Utility Expanded Capacity Enhanced: M1152A1	T37588	+52	n/d				
Truck Cargo: 5-ton WO/Winch	T41515	+274	n/d				
Truck Cargo: 2.5-ton 4X4 LMTV W/E W/W LAPES/AD	T42063	+8	n/d				
Truck Palletized (LHS): M1120A4	T55054	+317	n/d				
Truck Utility Expanded Capacity Enhanced: M1165A1	T56383	+159	n/d				
Truck Tank: WO/Winch	T58318	+17	n/d				
Truck Cargo: M985A4	T59380	+20	n/d				
Truck Cargo: WO/Winch	T59448	+251	n/d				
Truck Utility: Cargo/Troop Carrier 1-1/4 ton 4X4 W/E (HMMWV)	T61494	+108	n/d				
Truck Wrecker: M984A4	T63161	+72	n/d				
Truck: Palletized Loading	T81874	+23	n/d				
Truck Tractor: WO/Winch	T88983	+4	n/d				
Truck Wrecker: MTV W/E W/W	T94709	+10	n/d				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Modification of Aircraft							
Network and Mission Plan				$4,512,000	$4,353,000		
Comms, Nav Surveillance				4,145,000	4,145,000		
Global Air Traffic Management (GATM) Rollup				1,694,000	1,694,000		
Support Equipment and Facilities							
Common Ground Equipment				3,268,000	3,211,000		
Modification of Missiles							
Improved Target Acquisition System (ITAS) / TOW Modifications				514,000	514,000		
Weapons and Tracked Combat Vehicles (WTCV)							
M240 Medium Machine Gun (7.62mm)				0	185,000		
XM320 Grenade Launcher Module (GLM)				3,299,000	1,757,000		
Carbine				5,861,000	5,627,000		
M4 Carbine Modifications				1,215,000	4,411,000		
M2 .50 cal Machine Gun Modifications				11,660,000	11,660,000		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Tactical and Support Vehicles							
Tactical Trailers/Dolly Sets				2,237,000	0		
Ambulance, 4 Litter, 5/4 Ton, 4x4					20,000,000		
Family of Medium Tactical Vehicles (FMTV)				31,016,000	72,108,000		
Palletized Load System (PLS) Extended Service Program (ESP)				39,423,000	39,423,000		
Modification of In-service Equipment				49,822,000	40,207,000		
Communications and Electronics Equipment							
Warfighter Information Network-Tactical (WIN-T) - Ground Forces Tactical Network				3,180,000	3,180,000		
SMART-T (Space)				2,250,000	2,250,000		
Global Broadcast Service (GBS)				1,000,000	1,000,000		
Army Materiel Command (AMC) Critical Items - OPA-2				5,869,000	2,678,000		
Family of Medical Communications for Combat Casualty Care				11,868,000	3,209,000		
Army Civil Affairs (CA)/Military Information Support Operations (MISO) GPF Equipment				3,695,000	993,000		
Communications Security (COMSEC)				590,000	3,237,000		
Distributed Common Ground System - Army (DCGS-A) (MIP)				4,655,000	4,655,000		
Counterintelligence (CI) and Human Intelligence (HUMINT) Automated Reporting and Collection System (CHARCS) (MIP)				438,000	438,000		
Night Vision Devices				966,000	0		
Joint Battle Command - Platform (JBC-P)				11,984,000	12,984,000		
Air & Missile Defense Planning and Control System (AMDPCS)				8,896,000	8,896,000		
Network Management Initialization and Service				1,313,000	1,431,000		
Maneuver Control System (MCS)				29,999,000	25,873,000		
Global Combat Support System - Army (GCSS-A)				43,103,000	38,679,000		
Reconnaissance and Surveying Instrument Set				6,048,000	6,048,000		
Reserve Component Automation System (RCAS)				5,964,000	7,158,000		
Items less than $5M (Surveying Equipment)				896,000	1,255,000		
Other Support Equipment							
Ground Standoff Minefield Detection System (GSTAMIDS)				10,650,000	10,840,000		
Husky Mounted Detection System (HMDS)				3,391,000	3,391,000		
Robotic Combat Support System (RCSS)				2,136,000	2,136,000		
Remote Demolition Systems				1,492,000	1,492,000		
Items Less Than $5M (Countermine Equipment)				1,800,000	0		
Family of Boats and Motors				858,000	423,000		
Heaters and Environmental Control Units (ECUs)				2,366,000	0		
Family of Engineer Combat and Construction Sets				6,796,000	10,706,000		
Quality Surveillance Equipment				1,353,000	1,353,000		
Distribution Systems, Petroleum & Water				4,500,000	4,500,000		
Combat Support Medical				5,147,000	1,842,000		
Mobile Maintenance Equipment Systems				2,265,000	1,579,000		
Items Less Than $5M (Maintenance Equipment)				13,000	12,000		
Tractor, Full Tracked				12,156,000	4,178,000		
All Terrain Cranes				3,204,000	0		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Plant, Asphalt Mixing				984,000	0		
Enhanced Rapid Airfield Construction Capability				638,000	638,000		
Construction Equipment ESP				5,185,000	5,185,000		
Items Less Than $5M (Construction Equipment)				1,729,000	1,729,000		
Army Watercraft ESP				19,886,000	19,886,000		
Generators and Associated Equipment				27,586,000	0		
Family of Forklifts				4,828,000	4,828,000		
Training Devices, Nonsystem				26,326,000	8,961,000		
Aviation Combined Arms Tactical Trainer				5,262,000	5,262,000		
Gaming Technology in Support of Army Training				3,264,000	2,464,000		
Integrated Family of Test Equipment (IFTE)				4,294,000	4,505,000		
Test Equipment Modernization (TEMOD)				1,005,000	1,876,000		
Modification of In-service Equipment (OPA-3)				495,000	149,000		
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Mission Command							
Engineer C2 Recon & Survey System						$6,500,000	$6,500,000
Logistics Automation Systems						250,000	250,000
Command Post Shelter						600,000	600,000
Mobile Communication System						280,000	280,000
Tactical Radio Platform (Dual AC/DC)						170,000	170,000
SATCOM System						410,000	410,000
SATCOM Terminal (65CM)						720,000	720,000
SATCOM Terminal (95CM)						230,000	230,000
Tactical Networking System						400,000	400,000
First Responder Communication System						1,000,000	1,000,000
Engineer							
Mixer, Concrete						1,500,000	1,500,000
Hand Held Mine Detection						3,000,000	3,000,000
Hydraulic Electric Pneumatic Petroleum Operated Equipment (HEPPOE)						2,200,000	2,200,000
Mobile Power Tool Set						500,000	500,000
Motorized Grader						1,500,000	1,500,000
Vibratory Plate Compactor						250,000	250,000
Self Propelled Concrete Saw						200,000	200,000
Assault Craft (15 Man)						360,000	360,000
Assault Craft Boat Motors						800,000	800,000
Field Logistics							
Truck Lift Fork: 5K Rough Terrain						7,500,000	7,500,000
Test Measurement Diagnostic Equipment						520,000	520,000
Mobile Tactical Retail Refueling System						1,700,000	1,700,000
Load Handling System: 2000G Water						2,240,000	2,240,000
Expeditionary Shower Facility (8-10 Stall)						760,000	760,000
Field Laundry System						170,000	170,000
Logistics Support Area Equipment Package						130,000	130,000

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Lighting Equipment Kit						75,000	75,000
Medium Pressurized Storage Unit						152,500	152,500
Large Pressurized Storage Unit						35,000	35,000
Equipment Protective Cover Package						157,500	157,500
Maintenance Support Device V3						8,750,000	8,750,000
Armament Repair Shop Set						250,000	250,000
Metal Working and Machining Shop Set: Type I						465,000	465,000
Metal Working and Machining Shop Set: Type II						150,000	150,000
Measuring Tool Set Machinist						105,000	105,000
Fire Suppression Refill System						2,200,000	2,200,000
Oscilloscope: OS-305						400,000	400,000
Tactical Power							
Fuel Efficient / Clean Power Generator (250KW)						480,000	480,000
Fuel Efficient / Clean Power Generator (75/120KW)						200,000	200,000
Power Distribution System						700,000	700,000
Environmental Control Unit						420,000	420,000
Tactical Wheeled Vehicles							
HMMMWV Modernization						16,500,000	16,500,000
Palletized Loading System						19,000,000	19,000,000
HEMTT Cargo						19,000,000	19,000,000
HEMTT Fuel Tanker						1,950,000	1,950,000
HEMTT Wrecker						4,000,000	4,000,000
HEMTT Load Handling System						13,200,000	13,200,000
Truck Tractor - Yard						1,000,000	1,000,000
Medium Tactical Truck						2,750,000	2,750,000
Light Utility Trailer						1,600,000	1,600,000
Semitrailer Fuel Tanker						500,000	500,000
Heavy Equipment Trailer						2,500,000	2,500,000
Force Protection							
Driver Vision Enhancement						2,000,000	2,000,000
Small Unmanned Ground Vehicle						3,000,000	3,000,000
Concealment Package						570,000	570,000
Simulators							
Multiple Amputee Trauma Trainer						2,500,000	2,500,000
Common Driver						1,000,000	1,000,000
Transportation Reserve						500,000	500,000
Total				**$460,989,000**	**$431,194,000**	**$140,000,000**	**$140,000,000**

USAR
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 2019 Qty	Deployable?	
					Yes	No
Aircraft						
HH-60L: Medevac Helicopter	M33458	Helicopter Utility: UH-60L	H32361	30	X	
Utility Cargo Aircraft: UC-35A	U05004	Airplane, Utility: UC-35B	A05015	5	X	
Battle Command Transport Networks						
Satellite Communication System: AN/TSC-156	S23268	Satellite Communications Terminal: AN/TSC-93A	S34963	2	X	
Terminal: Satellite Communication AN/TSC-154	T81733	Satellite Communications Terminal: AN/TSC-93A	S34963	1	X	
Combat Mobility						
Bridge Armored Vehicle Launched Scissors TY: 63 FT (AVLB) MLC 70	B31098	Bridge Armor Vehicle Launch Scissor TY: CL 60 ALUM 60 FT LG OF SPAN	C20414	47	X	
High Mobility Engineer Excavator (HMEE): Type I	H53576	Tractor Wheeled: Industrial	T34505	58	X	
Loader Scoop Type: DSL 2-1/2CU YD Hinge Frame W/Multiple Purpose Bucket	L76556	Loader Scoop Type: 2.5 Cubic Yard	L76897	16	X	
Tractor Wheeled: DSL 4X4 w/Excavator & Front Loader	T34437	Tractor Wheeled: Industrial	T34505	10	X	
Field Logistics						
Assault Kitchen: (AK)	A94943	Kitchen: Company Level Field Feeding	K28601	39	X	
Rough Terrain Container Handler (RTCH): Kalmar RT240	R16611	Truck Lift Fork: DED 50K lb Container Handler Rough Terrain 48-in LC	T48941	26	X	
Shower: Portable 12 Head	S62898	Bath Unit Portable: GED 8-9 SH Less Power	B43663	2	X	
Force Protection						
Mask Chemical Biological Joint Service General Purpose: Field M50	M12986	Mask Chemical Biological: M40	M12418	47,383	X	
Mask Chem-Bio Joint Service General Purpose: Combat Vehicle Crewman M51	M13236	Mask Chemical Biological: Combat Vehicle M42	M18526	1,591	X	
General Engineering						
All Terrain Crane Type II: Heavy	Z05089	Crane: Wheel Mounted Hydraulic 25-Ton All Terrain AT422T	C36586	8	X	
Excavator: Hydraulic (HYEX) Multipurpose Crawler Mount	E27792	Tractor Full Tracked Low Speed: DSL MED DBP W/BULDOZ W/SCARIF WINCH	W76816	60	X	
Hydraulic Electric Pneumatic Petroleum Operate Equip: HEPPOE	H05004	Pneumatic Tool and Compressor Outfit: 250 CFM TRLR MTD	P11866	22	X	
		Tool Outfit Pioneer: PTBL Hydraulic/Electric Tools Outfit (HETO)	W58486	14	X	
Scraper Earthmoving: 14-18 CU YD	S05029	Scraper Earthmoving Self-Propelled: 14-18 CU YD (CCE)	S56246	51	X	
Tractor Full Tracked High Speed: Deployable LT Engineer (DEUCE)	T76541	Tractor Full Tracked Low Speed: DSL MED DBP W/BULDOZ W/SCARIF WINCH	W76816	3	X	
Soldier Systems						
Mini Eyesafe Laser Infrared Observation Set (MELIOS): AN/PVS-6	M74849	Target Locator Module	T27471	26	X	
Soldier Weapons						
Carbine 5.56mm: M4A1	C06935	Rifle 5 56mm: M4	R97234	14,643	X	
		Rifle 5.56mm: M16A2	R95035	77,062	X	

Major Item of Equipment Substitution List

Required Item Nomenclature	Reqd Item Equip No.	Substitute Item Nomenclature	Substitute Item Equip No.	FY 2019 Qty	Deployable?	
					Yes	No
Launcher Grenade: M320A1	L69080	Launcher Grenade 40mm: Sgle Shot Rifle mtd Dtchble	L44595	1,456	X	
		Launcher Grenade: M203A2	L69012	449	X	
Machine Gun Caliber .50: Heavy Fixed Turret Type	L91701	Machine Gun Grenade .50: HB Flexible (Ground and Vehicle) W/E	L91975	199	X	
Machine Gun: 7.62mm M240B	M92841	Machine Gun 7.62mm: M240L	M92454	20	X	
		Machine Gun 5.56mm: M249	M09009	486	X	
Machine Gun: Caliber 50	M39331	Machine Gun Caliber .50: HB Flexible (Ground & Vehicle) W/E	L91975	2,101	X	
Machine Gun Light: 5.56mm M249	M39263	Machine Gun 5.56mm: M249	M09009	692	X	
Pistol 9mm: M11	P47365	Pistol 9mm Automatic: M9	P98152	238	X	
Trailers						
Palletized Load System: Trailer-CTE	P05025	Trailer Flat Bed: 11-Ton 4-Wheel (HEMAT)	T45465	88	X	
Semitrailer Tank: 5000-gal Bulk Haul Self-Load/Unload W/E	S10059	Semitrailer Tank: 5K-gal Fuel Dispensing Automotive W/E	S73372	39	X	
Trailer Cargo: 1-1/2 ton 2-wheel W/E	W95811	Trailer Flat Bed: M1082 Trailer Cargo LMTV w/Dropsides	T96564	82	X	
Trailer Cargo: 12-Ton Light Engineer Utility Trailer	Z05224	Trailer Bolster: General Purpose 4-Ton 4-Wheel W/E	W94536	3	X	
		Trailer Cargo: MTV W/Dropsides M1095	T95555	56	X	
		Trailer Flatbed: 5-Ton 4-Wheel General Purpose	T96883	10	X	
Trailer Cargo: 5-Ton Light Engineer Utility Trailer	Z05186	Trailer Flat Bed: M1082 Trailer Cargo LMTV W/Dropsides	T96564	149	X	
Trailer Cargo: High Mobility 1-1/4 ton	T95924	Light Tactical Trailer: 3/4 ton	T95992	181	X	
Trucks						
Armored Security Vehicle: Wheeled w/Mount (ASV)	A93374	Truck Utility: ECV Armament Carrier W/IAP Armor Ready M1151A1	T34704	101	X	
Truck Cargo: 5-Ton WO/Winch	T41515	Truck Cargo: 5-Ton 6X6 MTV W/E LAPES/AD	T41036	7	X	
		Truck Cargo: 4X4 LMTV W/E W/W	T60149	56	X	
		Truck Cargo: MTV W/E.	T61908	153	X	
Truck Cargo: M985A4	T59380	Truck Cargo: Tactical HEMTT W/Med Crane	T39586	21	X	
Truck Cargo: Tactical 8X8 Heavy Expanded Mob W/LHS	T96496	Truck: M1075A1 with ECHU	T05063	51	X	
Truck Cargo: WO/Winch	T59448	Truck Cargo: 4X4 LMTV W/E W/W	T60149	5	X	
		Truck Cargo: LWB WO/Winch	T93271	7	X	
		Truck Cargo: MTV W/E.	T61908	1	X	
Truck Dump FMTV: 10-Ton	T65047	Truck Dump: 10-Ton W/Winch	T65274	4	X	
Truck Dump: 20-Ton DED 12 cu yd cap	X44403	Truck Dump: 5-Ton 6X6 W/E	X43708	23	X	
Truck Tank: Fuel Servicing 2500-gal HEMTT	T87243	Truck Tank: WO/Winch	T58318	34	X	
Truck Tractor: Heavy Equipment Transporter (HET)	T59048	Truck Tractor: M107A1	T05012	70	X	
Truck Tractor: MTV W/E	T88983	Truck Tractor: WO/Winch	T61239	20	X	
		Truck Tractor: MTV W/E W/W	T61307	30	X	
Truck Wrecker: MTV W/E W/W	T94709	Truck Wrecker	T94671	44	X	
Truck: Expandable Van WO/Winch	T67136	Truck Van: Expansible 5-Ton 6X6 (ARMY)	X62237	8	X	
		Truck Van: Expansible MTV M1087A1	T41271	15	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 but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded 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)	15,063*	14,010	$13K	$182M	JBC-P provides migration of legacy mounted battlespace awareness and logistics systems to a common application. The family of JBC-P systems are fielded IAW the G-3 approved Mission Command Modernization Priority List (MCMPL) and force provider's priorities. The Army has chosen to field JBC-P to the enabler centric units on the back end of the fielding plan making the Army Reserve susceptible to funding cuts or realignment of priorities. Approximately 90% of current mounted mission command systems are considered legacy with degraded capabilities.
2	Carbine 5.56mm - M4A1	124,147*	22,646	$700	$16M	The Army has chosen to field modern weapon systems to the enabler centric units on the back end of the fielding plan making the Army Reserve susceptible to funding cuts or realignment of priorities. 62% of current on-hand carbines in the Army Reserve are legacy M16 models identified for divestment. Potential funding issues with sustainment dollars and vendor production delays could potentially delay the pure fleet strategy beyond FY 2023. However, the current Army plan is funded and projected to be pure fleet by the 4th Qtr FY 2022.
3	7.5K Petroleum Semitrailer	480	82	$150K	$72M	The Army Reserve owns 100% of the total Army 7.5K tanker line haul capability. 82 of the 7.5K tankers, 17% of the current fleet, were coded obsolete and directed for turn-in resulting in a 615,000 gallon reduction in total capacity. The entire 7,500 gallon tanker semitrailer fleet exceeds economic useful life. There is currently no Army program to modernize this critical Early Entry / Theater Opening capability.
4	Joint Light Tactical Vehicle (JLTV)	14,687*	12,134	$335K	$4.1B	The JLTV program begins full rate production in FY 2019. Army Reserve is not scheduled to begin fielding until FY 2021, and 64% of the current Light Tactical Vehicle (LTV) fleet does not meet the minimum force protection standards for global deployment to a non-permissive threat environment. Funding projections indicate the Army Reserve LTV fleet will remain less than 40% armor capable through FY 2025.
5	Joint Assault Bridge (JAB)	96*	96	$5.77M	$554M	The JAB is a modern tracked bridging capability designed to enhance dry gap crossing for heavy armored combat units. The Army Reserve owns 55% of the total Echelon Above Brigade Army capability. The JAB will replace legacy Armored Vehicle Launch Bridges that exceed economic useful life. Army Reserve will field the first JAB systems in FY 2022.
6	Bridge Erection Boat (BEB) B05006 Variant	126*	22	$900K	$20M	Army Reserve owns 37% of the total Army requirement. Production began in FY 2018 with a fielding time horizon stretching beyond FY 2025. Army Reserve is projected to receive funding to modernize 7 of 9 companies (14 boats each) by FY 2022.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
7	Common Bridge Transport (CBT) - M1977A4	504*	224	$370K	$83M	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 and provides an armor variant capable of global deployment to a non-permissive environment. Army Reserve will field 5 of 9 companies (56 systems each) by FY 2019 with no additional procurements thru FY 2022.
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 and 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.
10	Line Haul Tractor - M915A5; M872 34T Semitrailer	4,040	2,274	Varies	$296M	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 FY 2014 before Army Reserve completed fielding the M915A5 armor capable variant. Only 42% (985/2340) of the existing Army Reserve M915 fleet is armor capable. 54% (919/1700) of the M872 trailer fleet were coded out due to corrosion in FY 2017.

* 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 purpose of the Marine Corps is to provide maritime expeditionary combined arms air-ground task forces that are "most ready when the Nation is least ready." We are a naval force whose mission requires our Corps to be ready—a fight-tonight, forward deployed, Next Generation force—able to respond immediately to emergent crises around the globe from the sea, forward bases, or home station.[1] As the Nation's "911 force," we are forward postured across the globe and engaged daily in deterrence and security cooperation efforts, all while remaining capable of rapidly aggregating Marines from adjacent Geographic Combatant Commands and the homeland to effectively respond to a national crisis.[2]

> The Marine Corps' foundational warfighting philosophy is maneuver warfare. Our doctrine defines maneuver warfare as "a warfighting philosophy that seeks to shatter the enemy's cohesion through a variety of rapid, focused, and unexpected actions which create a turbulent and rapidly deteriorating situation with which the enemy cannot cope." In the past, we successfully conducted maneuver warfare primarily in the physical dimension and employed combined arms in the air, land, and sea domains. Now, changes in the operating environment and adversary capabilities drive us to increase emphasis on maneuver in the cognitive dimension and expand our employment of combined arms to space and cyberspace domains. This expansion and enhancement of our warfighting approach are necessary to ensure we maintain our ability to defeat our enemies and win our Nation's battles.[3]

A. Marine Corps Planning Guidance

1. Strategic Concept of the Marine Corps

We are committed to optimizing our force structure for crisis response and forward presence.

> As a naval force, deployed Marines predominantly reside aboard ship fully integrated with the Navy while expanding the competitive space and advantage of the Joint Force. The ocean provides flexibility, freedom of maneuver, survivability, and agility. Despite being the subject of competitor tracking, hitting a moving target is much more difficult than a static one and thus affords much greater unpredictability—imposing a cost on any competitor. In recent history, we have found our forces tied to fixed locations in special arrangements to support necessary requirements during times of increased instability throughout specific regions of the globe. We must put forces back on the ship, whether on upgraded amphibious warships postured to respond to conflict or on alternative platforms. We recognize the continued challenges with our amphibious, maritime, and expeditionary ship inventory.[4]

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[1] Statement by the Commandant of the Marine Corps before the House Appropriations Committee – Defense Concerning the Commandant's Posture of the United States Marine Corps, March 7, 2018, p. 1.
[2] Ibid, p. 2.
[3] Commandant of the Marine Corps, *Marine Corps Operating Concept: How an Expeditionary Force Operates in the 21st Century*, September 2016, p. 8.
[4] Ibid, p. 19.

Despite these challenges, our Marine Corps remains the Nation's Force in Readiness.

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 Marine Corps Reserve 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 our adversaries. Over the past year, the Marine Corps Reserve supported combatant commanders (CCDRs) by 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, have developed the Marine Corps Reserve's depth of experience, ensuring they are relevant, ready, and responsive to meet CCDRs' requirements for highly trained, general-purpose forces.[5]

B. Marine Corps Equipping Policy

The Marine Corps develops a Total Force Approved Acquisition Objective (AAO) for each new item of equipment. The AAO is the quantity of an item authorized for peacetime and wartime requirements to equip and sustain the Service in accordance with current DoD policies and plans. The Marine Corps develops the 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, 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. With the exception of several aviation units, RC units remain highly interoperable with the AC due to the Marine Corps' Total Force approach to equipment fielding and management.[6]

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 on hand for training at the Reserve Training Centers. This method allows units to maintain the necessary amount of equipment to conduct training, provide sustained maintenance, and properly store the T/A within personnel and facility constraints. Marine Corps Systems Command (MARCORSYSCOM) procures ground equipment for the RC, with all equipment above the T/A (the difference between the T/A and the T/E) stored at Marine Corps Logistics Bases and other "in stores" locations. Globally pre-positioned equipment can be used to bring RC units to full T/E equipping levels should the need arise. The Marine Corps has used this methodology, known as "global sourcing," effectively to satisfy past RC and AC unit equipment shortfalls.

[5] Commander, Marine Forces Reserve, *Statement before the House Appropriations Committee Subcommittee on Defense Concerning Marine Corps Reserve,* April 12, 2018, p. 4.
[6] Ibid, p. 6.

D. Initiatives Affecting RC Equipment

Modernization is a vital component of our readiness—our ability to deter and defeat technologically sophisticated state actors. Previous decrements to our modernization accounts deferred future capabilities and infrastructure improvements that prolonged our reliance on legacy systems that lack the required capabilities for the future. Over time, legacy systems cost more to repair and sustain.[7] As our nation continues to face fiscal uncertainty, delays in investment funding have affected the Marine Corps' modernization efforts as well as the ability to divest of legacy equipment. The Marine Corps Reserves' increasing costs to maintain its legacy equipment will become more costly, which in turn will have significant adverse effects on unit training and overall readiness.

E. Plan to Achieve Full Compatibility between AC and RC

Horizontal fielding of new ground equipment to the AC and RC by MARCORSYSCOM maintains common and interchangeable capability sets within the Total Force. This Marine Corps Total Force fielding approach complements the "mirror-imaging" and push-fulfillment sustainment policies, both of which have significantly contributed to RC units remaining highly interoperable with their AC counterparts. Furthermore, the Marine Corps Reserve leverages National Guard and Reserve Equipment Appropriation (NGREA) to supplement funding deficiencies, which has also assisted in helping bring better parity between the RC and AC.

[7] Deputy Commandant Plans, Policies, and Operations, *Statement before House Armed Services Subcommittee on Readiness Concerning Marine Corps Reserve,* March 6, 2018, p. 2.

II. Marine Corps Reserve Overview

A. Current Status of the Marine Corps Reserve

1. General Overview

Top RC Equipping Challenges

- Transition to KC-130J Super Hercules
- Aviation and Ground Equipment Modernization
- Aviation and Ground Equipment Maintenance

The Marine Corps Reserve is an integral part of the Total Force. It is organized, trained, and equipped to the same standards as its AC counterparts, which facilitates the seamless employment of Reserve Forces in order to meet CCDR requirements. The Marine Corps Reserve provides critical capabilities to the Total Force, which increases the lethality of the Corps and contributes to the competitive advantage maintained over our adversaries. The Marine Corps stands ready to answer the Nation's call to arms.

> Marine Corps Reserve units have been fully engaged across the globe over the past 16 plus years of combat operations—serving as an essential shock absorber and force multiplier. The Marine Corps Reserve remains focused on its ability to provide manned, trained, equipped, and well-led forces capable of augmenting, reinforcing, and supporting the AC.[8]

The demand for unique capabilities within the Marine Corps Reserve has increased, requiring more RC activations of units and ad hoc formations to produce enabling capabilities across the range of military operations.[9] Consequently, the role of Marine Forces Reserve (MARFORRES) has evolved from a strategic capability to both an operational and strategic capability. MARFORRES provides forces for preplanned, rotational, and routine CCDR and Service requirements ranging from individual augmentation of AC staffs, security cooperation engagements, and multinational exercises to contingency operations, humanitarian assistance missions, and other steady state missions. MARFORRES will continue to deploy and integrate with AC forces to meet CCDR requirements using existing mobilization authorities.[10]

The top procurement priority for the Marine Corps Reserve involves the transition to the KC-130J Super Hercules. The AC has fielded the Primary Mission Aircraft for KC-130J Super Hercules, while the RC has only fielded seven of 28 KC-130J aircraft, leaving 21 of the older model KC-130T aircraft in the RC. These two aircraft have vastly different logistics, maintenance, and aircrew requirements, resulting in an increased outlay of resources to maintain the readiness of the RC KC-130 Squadrons.

In addition to transitioning to the KC-130J, the Marine Corps Reserve is preparing to conduct several modernization efforts that will affect unit readiness. This includes the transition from the AH-1W attack helicopter to the AH-1Z platform and the removal of the F/A 18A++ aircraft from the inventory once replaced with the updated F/A 18C+ modification. For ground vehicles, transitions to the Amphibious Combat Vehicle (ACV) and the Joint Light Tactical Vehicle

[8] Commander, Marine Forces Reserve, *Statement before House Armed Services Subcommittee on Readiness Concerning Marine Corps Reserve,* March 6, 2018, p. 2.
[9] Ibid, pg. 7.
[10] Ibid, pg. 7.

(JLTV) will begin as those programs reach 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 Marine Corps Reserve 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 units can effectively conduct training with the amount of equipment that can reasonably be maintained within existing personnel and fiscal resource constraints. This method, along with the use of Overseas Contingency Operations-funded Marine Corps Logistics Command mobile maintenance support teams that travel to Reserve Training Centers and augment the limited organic maintenance capacity, has ensured MARFORRES equipment is at an acceptable state of readiness. With the exception of legacy equipment, the RC maintains equipment to the same standards as the AC, which facilitates a seamless employment for the CCDR.

a. Equipment On-hand

The MARFORRES equipment on hand (EOH) consists of the T/A which is the minimum amount of equipment required to train at the Reserve Training Centers. By storing the equipment delta (the difference between the T/A and the T/E) at Marine Corps Logistics Bases and other "in stores" locations, MARFORRES is able to maintain 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 Marine Corps Reserve units for the period FY 2020 through FY 2022. These quantities are an aggregate of the EOH and equipment maintained by Marine Corps 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, with the exception of several select aviation units.

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 2019. 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 the Assault Amphibious Vehicle. Maintaining legacy equipment creates significant challenges due to equipment approaching the end of its lifecycle and lack of supply parts. These legacy systems are either in upgrade or modification programs that will extend the lifecycle of the equipment, or, have fielding of replacement equipment planned.

c. Compatibility of Current Equipment with Active Component

The RC remains near parity with its AC counterparts due to the Total Force approach to equipment fielding. However, the fiscal instability of the past several years and the continued reality of ongoing budgetary uncertainty disrupts our ability to program long-term activities, and challenges our efforts to improve current and future readiness. To continue to meet operational commitments and maintain a ready force, the Marine Corps requires greater fiscal stability and

increased congressional support. One example of this is the procurement of additional KC-130J aircraft for the RC. These additional aircraft will bring the RC closer to achieving parity by several years, thereby ensuring this critical capability is available for operations in support of the AC in the near future.

d. Maintenance Challenges

Several factors affecting maintenance across the RC include limited personnel resources to identify and conduct maintenance, recent equipment modernizations, and increased mobilizations. RC units are limited to the small full-time support staffs at each Reserve Training Center that is augmented by Reserve Marines during the monthly drill and two-week annual training period. Focusing these limited resources on the combat essential readiness reportable items constrains routine preventive and corrective maintenance on the remainder of the equipment. In recent years, the Marine Corps' demand for unique capabilities has increased, requiring more RC activations of units and ad-hoc formations. This increase in the employment of RC forces has subsequently generated excessive wear on combat equipment. Consequently, maintenance requirements, demand for secondary repairable, and the replenishment of gear have out-paced previous forecasts. Aviation readiness challenges across the Marine Corps enterprise, caused by a combination of aging aircraft, maintenance backlogs, and unresponsive supply chains have affected MARFORRES aviation units.

e. Modernization Programs and Shortfalls

Marine Corps 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 Marine Corps Aviation Plan and, during the current out years planning profile, the RC squadrons will transition to several new aircraft platforms. The RC has historically used NGREA funding to procure aviation-training simulators to facilitate the transition to the new aircraft.
- Combat Equipment Modernization: The Marine Corps is acquiring major ground equipment modernizations that will provide the RC with the latest generation of warfighting capabilities.

f. Overall Equipment Readiness

Equipment readiness for RC units remains consistent with AC 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 Marine Corps enterprise.

B. Changes since the Last NGRER

There were several major changes since last year's NGRER that had a significant impact on the RC achieving interoperability with the AC. The fielding of the RQ-21A Blackjack UAS to the RC, originally scheduled for FY 2020, was completed in FY 2018. In addition, the Mobile Integrated Remains Collection System (MIRCS) became a Marine Corps Program of Record for procurement. Lastly, congressional adds to last year's Presidential Budget for the procurement of

four additional KC-130J aircraft (six total aircraft) has greatly accelerated the KC-130J planned procurement from FY 2026 to FY 2023.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

The Marine Corps 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. KC-130J Super Hercules

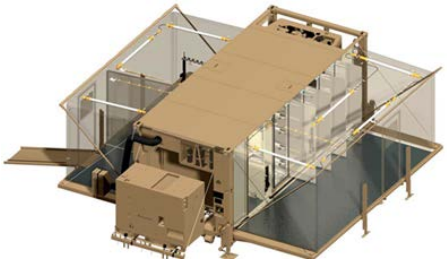
The number one procurement priority for the Marine Corps Reserve includes accelerating the fielding of the KC-130J. This is also the most expensive RC equipment shortfall, costing over $1.93 billion. The KC-130J is a multi-role, multi-mission tactical tanker/transport aircraft developed to replace the KC-130F/R/T models. This aircraft has increased range and speed, lower cost per flight hour, better fuel efficiency, improved reliability, and better maintainability. The AC completed the KC-130J transition in FY 2009, which left 28 KC-130T aircraft in the RC (12 Primary Mission Aircraft and 2 Backup Aircraft per RC Squadron). Budget challenges that resulted in competing Aircraft Procurement Navy appropriation priorities within the Navy and Marine Corps delayed the fielding of the KC-130J to the RC. Since FY 2014—when the RC began the transition—VMGR-234 (RC KC-130J Squadron) has received only seven aircraft. There are 11 KC-130J aircraft funded and pending delivery. The remaining 10 KC-130J aircraft are programmed within the out-years planning profile. Thanks to a Congressional add, six total KC-130Js were budgeted in 2018, accelerating the fielding of aircraft from FY 2026 to FY 2023. VMGR- 234 is scheduled to receive one aircraft in FY 2019, increasing the total number of aircraft to eight. Additionally, VMGR-452 is scheduled to begin fielding of one KC-130 J aircraft in FY 2019. Compatibility differences between the KC-130J and KC-130T are creating significant challenges in training, manning, and logistical support.

b. Joint Light Tactical Vehicle (JLTV)

The JLTV is a joint Army/Marine Corps program to procure the next generation of light tactical vehicles and companion trailers. The program 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 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 9,091 JLTVs. The RC is slated to receive 837 vehicles starting in FY 2022. The new RC LAAD equipment set may introduce more JLTVs to the RC once the final capability is selected and sourced.

c. Mobile Integrated Remains Collection System



The MIRCS is a new capability authorized within the Marine Corps inventory required by DoD standards for mortuary affairs operations. This system is a modular, self-contained, International Organization for Standardization-compatible platform that is used for processing and storing human remains to support mortuary affairs operations. The MIRCS became a Marine Corps program of record in FY 2019 and will be fielded to Marine Corps Forces Reserve, Maritime Prepositioning Force and War Reserve Materiel Requirements. The Marine Corps Reserve plans to use NGREA to procure 12 MIRCS per the AAO for Personnel Retrieval and Processing Company, Combat Logistics Regiment 45, which is the Marine Corps' sole mortuary affairs capability. Procurement of this system bridges the lasting capability gap within the USMC to effectively conduct mortuary affairs operations while supporting many small units. Furthermore, it provides the Marine Corps the ability to meet the demands of a high operational tempo by providing the capability to rapidly concentrate, disperse, and re-concentrate in dispersed operating environments.

3. Anticipated New Equipment Requirements

a. KC-130J Weapons Systems Trainer

The anticipated fielding of the KC-130J aircraft to VMGR-452, beginning in FY 2019, creates a requirement for one KC-130J Weapons Systems Trainer (WST) at Newburgh, NY, that will allow for the most realistic simulation training available and give Marine pilots the opportunity to train within a variety of scenarios. Thanks to congressional support, the Marine Corps Reserve was able to procure one KC-130J WST in 2014 at Fort Worth, TX, during the initial fielding of KC-130J to VMGR-234 in using NGREA funds. The KC-130J WST at VMGR-234 has successfully supported the training requirements for their pilots, which is the same objective the Marine Corps Reserve is seeking to accomplish for the forthcoming KC-130J transition at Newburgh, NY. This device is integral to pilot conversion training and achieving systems proficiency prior to the delivery of aircraft while significantly reducing the "in aircraft" flight hours required to maintain Mission Essential Task proficiency after aircraft delivery.

b. KC-130J Enlisted Aircrew Training Systems

As the RC is transitioning to the KC-130J in VMGR-452, there is a need to provide training for new systems to cover all crew-master training tasks in order to address the significant differences between the legacy KC-130T and the new KC-130J models. The KC-130J Enlisted Aircrew Training Systems (EACTS)—which consist of the Cockpit Procedures Trainer, Fuselage Trainer, and observer trainer aid—provide the Marine Corps KC-130J Crew Resource Management training and qualification. Strong congressional support enabled the Marine Corps Reserve to procure the EACTS using NGREA funding during the KC-130J transition of VMGR-234. With the anticipated fielding of KC-130J in VMGR-452, the Marine Corps Reserve seeks to procure one EACTS in Newburgh, NY as legacy trainers do not train to all existing crew-master training tasks, and attaining this training system reduces the impacts to the maintenance and operational readiness of USMC flight crews. This device is integral to aircrew conversion training and to achieving systems proficiency in order to maintain required Mission Essential Task proficiency.

c. Amphibious Combat Vehicle

The Marine Corps established the ACV program as a way to acquire an enhanced capability to transport Marines from ship-to-shore under hostile conditions. The ACV is envisioned to potentially replace all or part of the current Assault Amphibious Vehicle (AAV) fleet, which has been providing this capability since 1972. The acquisition contract for ACV 1.1 is currently in Low Rate Initial Production. The fielding to the Marine Corps Reserve, 4th Amphibious Assault Battalion, will begin during ACV increment 1.2. As part of a service initiative to minimize the maintenance challenges associated with the age of equipment, the existing AAV fleet will go through depot level maintenance to extend the vehicles' service lifecycle to FY 2035. ACV supports ship-to-objective maneuvers by providing the capability to self-deploy from amphibious ships. A seamless transition between sea and land enables the seizure of beach landing zones where conditions preclude other types of entry and facilitate rapid build-up of combat power ashore before an enemy can mount an effective response. The ACV will enable the Marine Corps to achieve an over-the-horizon, joint forcible-entry capability that enhances future amphibious concepts of operation.

d. Ground/Air Task Oriented Radar

The Ground/Air Task Oriented Radar (G/ATOR) AN/TPS-80 is a three-dimensional, expeditionary, short/medium-range, multirole radar capable of detecting low-observable, low-radar-cross-section targets such as rockets, artillery, mortars, cruise missiles, and unmanned aerial systems. The G/ATOR is being developed and fielded in two blocks and will be employed by the Marine Air/Ground Task Force across the range of its capabilities. The capability blocks will cover Air and Ground Combat Element missions, replacing three in-service legacy radars and the functionality of two systems already retired. G/ATOR is comprised of three major subsystems: the Radar Equipment Group (REG), Communications Equipment Group (CEG), and Power Equipment Group (PEG). The REG, CEG, and PEG without prime movers are rapidly deployable via helicopter/tiltrotor, KC-130, or ground vehicles during the first stages of operations. This system can augment sea-based air-defense sensors and command and control capabilities and provide naval and joint forces with an expeditionary radar and cruise missile detection capability that extends landward battle space coverage. The Marine Corps plans to procure 45 G/ATOR systems. The RC is slated to receive a total of eight systems with four systems being delivered in FY 2022.

4. Anticipated Transfers from AC to RC

The infantry battalion equipment set approved to support the Unit Deployment Program 19.1 rotation will be transferred from 1st Marine Division (AC) back to 4th Marine Division (RC).

5. Anticipated Withdrawals from RC Inventory

The last 12 KC-130T aircraft are scheduled to be removed from the RC inventory by FY 2022 as part of the transition to the KC-130J. Furthermore, as the RC prepares to transition to the AH-1Z aircraft, there are 30 AH-1W aircraft being removed from the inventory as part of the platforms' "sundown" plan.

6. Equipment Shortages and Modernization Shortfalls at the End of FY 2022

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 2022. *Table 8 Significant Major Item Shortages*, presents the RC's highest priority unfunded equipment and modernization shortfalls affecting Reserve unit training allowances.

D. Summary

"Despite the challenges facing us in today's strategic environment, the Marine Corps remains our Nation's crisis response force and will continue to be most ready when our nation is least ready. When the Nation calls, the American people expect quick and decisive action from the Marine Corps. As part of the Total Force Marine Corps, MARFORRES must remain manned, trained, and equipped to provide lethal forces to the AC to respond across the operational spectrum from disaster relief to full-scale combat operations. Today's unstable operating environment is further complicated by fiscal uncertainty; it is essential for the Marine Corps Reserve to remain engaged in current operations, maintain our warfighting readiness, and reset our equipment—while also

taking the necessary strides to modernize the force. With continued unwavering congressional support, the RC will make pragmatic decisions on how to best balance our available resources between current commitments and future readiness requirements."[11]

[11] Ibid, p. 26.

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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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 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	8	12	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	9	13	18	20	28
Aircraft, Refueling/Cargo, KC-130T	KC-130T	$79,610,000	12	8	2	0	0
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-1W	AH-1W	$19,510,000	30	19	0	0	0
Helicopter, Attack AH-1Z	AH-1Z	$30,450,000	0	0	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	7	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	2
Fuselage Trainer, KC-130J	KC-130J FUT	$17,078,182	0	0	1	1	2
Cockpit Procedures Trainer, KC-130J	KC-130J CPT	$4,937,258	1	1	1	1	2
Observer Training Aid, KC-130J	KC-130J OTA	$3,278,150	0	1	1	1	2
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	3	4	4
High Frequency Vehicle System	A0067	$53,234	152	152	152	207	207
Radio Set	A0139	$47,828	71	71	71	111	111
Radio Set	A0153	$224,839	38	38	38	63	63

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Power Module	A0172	$5,165	10	10	10	27	27
Comm Security Module (CSM)	A0173	$44,550	55	55	55	89	89
LAN Service Module (LSM)	A0174	$92,330	56	56	56	89	89
Computer Digital Data Transfer	A0175	$2,615	71	71	71	114	114
LAN Extension Module	A0176	$27,930	210	210	210	353	353
Application Server Module (ASM)	A0177	$14,980	58	58	58	89	89
Very Small Aperture Terminal - Small (VSAT-S)	A0234	$80,000	21	21	21	32	32
Very Small Aperture Terminal - Medium (VSAT-M)	A0241	$90,000	11	11	11	13	13
Very Small Aperture Terminal - Large (VSAT-L)	A0242	$295,000	14	14	14	26	26
VSAT Master Reference Terminal (MRT)	A0244	$105,000	7	7	7	13	13
Combat Operations Center (COC) V(3)	A0254	$1,698,000	6	6	6	8	8
Combat Operations Center (COC) V(4)	A0255	$1,220,000	17	17	17	19	19
Combat Operations Center (COC) V(2)	A0271	$4,950,000	1	1	1	1	1
Wan Services Module (WSM) V2	A0312	$41,850	109	109	109	109	163
Intelligence/Operations Workstation	A0932	$2,810	149	149	149	165	165
Radar Set, Firefinder	A1440	$4,800,000	4	4	4	5	5
Radar Set	A1503	$15,217,555	1	1	1	2	2
Radio Set	A1957	$43,986	184	184	184	184	281
Radio Set, Multiband (Maritime)	A2044	$7,431	204	204	204	204	558
Terminal, Radio, Troposcatter, Digital	A2179	$1,500,000	16	16	16	28	28
TRSS Radio Repeater Set	A2300	$22,687	70	70	70	96	96
Advanced Field Artillery Tactical Data System	A2555	$2,844	147	147	147	163	163
Tactical SATCOM, Transportable (SMART-T)	A3232	$825,000	6	6	6	6	9
Sensor, Ground, Unattended	A3255	$867,264	6	6	6	6	6
Engineer							
Air Conditioner, Horizontal, 1.5-ton, 60Hz, 18K Btu	B0003	$10,021	26	26	26	7	7
Air Conditioner, 5-ton, 60K; R-22	B0008	$20,251	62	62	62	86	86
Environmental Control Unit, Horizontal, 36K Btu; R-22	B0014	$15,092	184	184	184	273	273
Distribution System, Mobile Elect PWR, 5kW (Indoor)	B0027	$4,500	295	295	295	246	246
Distribution System, Mobile Elect PWR, 5kW (Outdoor)	B0028	$7,500	398	398	398	343	343
Distribution System, Mobile Elect PWR, 15kW	B0029	$8,800	166	166	166	197	197
Distribution System, Mobile Elect PWR, 30kW	B0030	$16,100	161	161	161	143	143
Distribution System, Mobile Elect PWR, 100kW	B0031	$28,500	90	90	90	80	80
Distribution System, Mobile Elect PWR, 300kW	B0032	$22,100	14	14	14	23	23
All Terrain Crane (ATC) Mac-50	B0038	$578,000	23	23	23	26	26
Airfield Damage Repair (ADR) Kit	B0039	$450,000	3	3	3	7	7
Medium Crawler Tractor (John Deer)	B0060	$325,000	56	56	56	56	56
Tractor, Rubber Tire, Articulated Steering, Mp	B0063	$198,708	117	117	117	106	106
Light Weight Water Purification System	B0071	$194,580	44	44	44	53	53
Air Conditioner, MCS Horizontal, 60Hz, 9K Btu; R-22	B0074	$9,510	19	19	19	17	17

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Grader, Road, Motorized	B0078	$236,008	22	21	21	21	21
Low Metallic Signature Mine Detector	B0102	$23,976	150	150	150	180	180
Boat, Bridge Erection, Inboard Engine	B0114	$249,187	10	10	10	10	63
Interior Bay, M17	B0121	$111,968	60	60	60	108	108
Ramp Bay	B0122	$134,112	27	27	27	45	45
Bridge, Medium Girder, Dry Gap	B0152	$964,515	9	9	9	12	12
Container Handler, RT, Kalmar	B0392	$525,000	9	9	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	10	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, 30kW/60Hz, TQD	B0953	$22,046	142	142	142	284	284
Generator Set, Skid-mtd, 60kW/60Hz, TQD	B1021	$26,956	171	171	171	211	211
Generator Set, 100kW, 60Hz, Skid-mtd, TQD	B1045	$67,000	58	58	58	50	50
Refueling System, Expedient, Helo	B1135	$101,863	6	6	6	9	9
Pump Module, Fuel (SIXCON)	B1580	$23,350	82	82	82	135	135
Roller, Compactor, Vibratory, Self-Propelled	B1785	$63,000	8	8	8	10	10
Storage Tank Module, Fuel (SIXCON)	B2085	$6,948	385	385	385	432	432
Storage Tank Module, Water (SIXCON)	B2086	$5,524	120	120	120	120	307
Sweeper, Rotary, Vehicle Mounting	B2127	$215,781	2	6	6	6	6
Loader, Backhoe (BHL)	B2483	$83,359	28	28	28	34	34
Truck, Forklift, Variable Reach	B2561	$99,245	72	72	72	67	67
Forklift, RT, Lt Capability (LRTF)	B2566	$74,750	91	91	91	91	89
Purification System, Water, Tactical	B2605	$350,000	20	20	21	21	21
General Supply							
Escalation of Force-Mission Modules (EOF-MM)	C0104	$422,000	7	7	8	9	9
Tamdem Offset Resupply Delivery System (TORDS)	C6375	$18,736	10	10	10	10	10
Raiding Craft, Combat, Rubber, Inflatable (CRRC)	C5901	$10,500	47	47	47	86	86
Motor Transport							
Truck, Armored, Cargo 7-ton, W/O Winch Reducible	D0003	$294,176	467	467	467	467	467
Truck, Armored, XLWB, W/O Winch Reducible	D0005	$181,000	31	31	31	42	42
Truck, Armored, Dump 7-ton W/O Winch Reducible	D0007	$190,000	33	33	33	40	40
Truck, RTAA, Tractor, 7-ton, W/O Winch	D0009	$220,000	28	28	28	20	20
Truck, Armored, Tractor, 7-ton, W/O Winch, Reducible	D0013	$220,000	38	38	38	44	44
Truck, Armored, Wrecker, 7-ton, W/Winch Non-Reducible	D0015	$400,000	49	49	49	53	53
Truck, Utility, Expanded Capacity, Enhanced, M1152	D0022	$186,729	395	395	395	326	326
Truck, Utility, Expanded Capacity, Armament Carrier	D0030	$238,500	662	662	662	717	717
Truck, Utility, Expanded Capacity, C2/GP Vehicle	D0031	$212,255	113	113	113	129	129

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Truck, Utility, ECV, TOW Carrier, Armored	D0032	$222,487	48	48	48	56	56
Truck, Utility, Expanded Capacity, Fully-armored (2-door)	D0033	$193,595	214	214	214	279	279
Truck, Utility, Ground Mobility Vehicle, Armored (4-door)	D0034	$321,959	189	189	189	232	232
Truck, RTAA, Cargo, 7-ton, W/O Winch	D0198	$141,022	670	670	670	465	465
Semitrailer, Refueler, 5,000 gal	D0215	$214,064	63	63	63	64	64
Semitrailer, Lowbed, 40-ton	D0235	$61,710	57	57	57	57	60
Trailer, Cargo, Resupply for HIMARS	D0861	$56,156	38	38	38	36	36
Truck Cargo 22.5-ton, 10X10, (LVSR)	D0886	$724,828	184	184	184	218	218
Truck, Tractor, 10X10 (LVSR)	D0887	$653,179	43	43	43	58	58
Truck, Ambulance, 4-Litter, Armored, 2 1/4-ton, HMMWV	D1001	$142,918	66	66	66	85	85
Truck, Ambulance, 2-Litter, Soft Top, 2 1/4-ton, HMMWV	D1002	$68,212	27	27	27	36	36
Truck, RTAA, XLWB Cargo, 7-ton, W/O Winch	D1062	$238,424	128	128	128	169	169
HIMARS, Armored Resupply Vehicle, Non-Reducible	D1063	$404,398	42	42	42	36	36
Truck, RTAA, Dump, 7-ton, W/O Winch	D1073	$174,699	59	59	59	34	34
Truck, Util, Cargo/Troop Carr, 1 1/4-ton, W/Eqp, HMMWV	D1158	$60,409	969	969	969	520	520
Truck, Wrecker, 10X10 (LVSR)	D1214	$1,013,405	15	15	15	15	21
Ordnance & Weapons							
Scout Sniper Mid-Range Night Sight (SSMRNS)	E0020	$8,795	378	378	378	378	421
Portable Lightweight Designator Rangefinder (PLDR)	E0042	$79,400	68	68	68	100	100
Saber System	E0055	$970,000	70	70	70	70	84
Semiautomatic Sniper System (SASS)	E0103	$8,500	190	190	190	152	152
Circle, Aiming	E0180	$6,814	91	91	91	92	92
Javelin	E0207	$133,063	60	60	60	56	56
Equipment Set, Night Vision	E0330	$116,014	24	0	0	0	0
Howitzer, Lightweight, Towed, 155mm	E0671	$2,500,000	48	48	48	48	48
Assault Amphibious Vehicle (AAV), Command	E0796	$2,000,000	9	9	9	9	9
Assault Amphibious Vehicle, Personnel	E0846	$3,500,000	182	182	182	182	182
Assault Amphibious Vehicle, Recovery	E0856	$2,000,000	5	5	5	7	7
Launcher, Rocket, Assault, 83mm	E0915	$6,500	171	171	171	171	171
Launcher, Tubular, F/GM TOW Weapon System	E0935	$75,742	21	0	0	0	0
Light Armored Vehicle (LAV), Anti-Tank	E0942	$2,091,280	12	12	12	24	24
LAV, Command & Control (Battalion)	E0946	$3,255,380	11	11	11	16	16
LAV, Light Assault, 25mm	E0947	$3,241,100	87	87	87	68	68
LAV, Logistics	E0948	$1,883,020	22	22	22	40	40
LAV, Mortar	E0949	$2,507,080	13	13	13	12	12
LAV, Maintenance/Recovery	E0950	$2,183,920	8	8	8	8	8
Machine Gun, Cal .50, Browning, HB Flexible	E0980	$8,118	558	558	558	627	627
Machine Gun, Medium, 7.62mm, Ground Version	E0989	$7,927	1,473	1,473	1,473	1,404	1,404
Heavy Machine Gun, 40mm	E0994	$15,320	558	558	558	540	540
Common Laser Range Finder System	E1048	$26,236	469	469	469	514	514

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Mortar, LW Company, 60mm, M224A1	E1065	$64,652	66	66	66	63	63
Mortar, Medium, 81mm, Extended Range	E1095	$133,500	68	68	68	68	68
Recovery Vehicle, Full-tracked, Heavy, W/Equip	E1378	$2,748,846	13	13	13	24	24
Neutralization Device, Ordnance, Remote, MK3MOD0	E1385	$265,868	2	2	2	3	3
Rifle, Sniper, 7.62mm, M40A5	E1460	$7,503	210	210	129	129	129
Rifle, Scoped, Special Application, .50 Cal.	E1475	$12,078	71	71	71	67	67
Rocket System, Artillery, High Mobility (HIMARS)	E1500	$5,033,000	18	18	18	18	18
Receiver, Infrared (Stinger)	E1837	$24,068	3	3	3	4	4
Tank, Combat, Full-tracked, 120mm Gun	E1888	$2,393,439	50	50	50	86	86
Sight, Weapon, Thermal, Medium (MTWS)	E1975	$11,300	1,216	1,216	1,216	1,216	1,216
Sight, Weapon, Thermal, Heavy (HTWS)	E1976	$11,999	1,193	1,193	1,193	1,193	1,193

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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Aircraft, Fighter/Attack, F/A-18A++	F/A-18A++	32	
Aircraft, Refueling/Cargo, KC-130T	KC-130T	26	
Aircraft, Refueling/Cargo, KC-130J	KC-130J	5	
Aircraft, Utility/Cargo, UC-12W	UC-12W	8	
Aircraft, Utility/Cargo, UC-35C	UC-35C	18	
Aircraft, Utility/Cargo, UC-35D	UC-35D	13	
Aircraft, Fighter, F-5F	F-5F	40	
Aircraft, Fighter, F-5N	F-5N	37	
Tilt-rotor, Cargo, MV-22B	MV-22B	10	
Helicopter, Attack, AH-1W	AH-1W	25	
Helicopter, Utility, UH-1Y	UH-1Y	3	
Helicopter, Cargo, CH-53E	CH-53E	20	
RQ-21A Blackjack System	RQ-21A	1	
Communications/Electronics			
High Frequency Vehicle System	A0067	13	
Radio Set	A0153	11	
Very Small Aperture Terminal - Small (VSAT-S)	A0234	6	
Very Small Aperture Terminal - Medium (VSAT-M)	A0241	6	
Very Small Aperture Terminal - Large (VSAT-L)	A0242	5	
VSAT Master Reference Terminal (MRT)	A0244	6	
Combat Operations Center (COC) V(3)	A0254	3	
Combat Operations Center (COC) V(4)	A0255	3	
Combat Operations Center (COC) V(2)	A0271	3	
Radio Set	A1957	21	
Motor Transport			
Truck, Armored, Cargo 7-ton, W/O Winch Reducible	D0003	12	
Truck, Armored, XLWB, W/O Winch Reducible	D0005	12	
Truck, Armored, Dump 7-ton W/O Winch Reducible	D0007	9	
Truck, RTAA, Tractor, 7-ton, W/O Winch	D0009	7	
Truck, Armored, Tractor, 7-ton, W/O Winch, Reducible	D0013	7	
Truck, Armored, Wrecker, 7-ton, W/Winch Non-Reducible	D0015	7	
Truck, Utility, Expanded Capacity, Enhanced, M1152	D0022	10	
Truck, Utility, Expanded Capacity, Armament Carrier	D0030	10	
Truck, Utility, Expanded Capacity, C2/GP Vehicle	D0031	10	
Truck, Utility, ECV, TOW Carrier, Armored	D0032	10	
Truck, Utility, Expanded Capacity, Fully-armored (2-door)	D0033	10	
Truck, Utility, Ground Mobility Vehicle, Armored (4-door)	D0034	10	
Truck, RTAA, Cargo, 7-ton, W/O Winch	D0198	12	
Semitrailer, Refueler, 5,000 gal	D0215	16	

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Average Age of Equipment

Table 2

Nomenclature	Equip No.	Average Age	Remarks
Semitrailer, Lowbed, 40-ton	D0235	16	
Trailer, Cargo, Resupply for HIMARS	D0861	12	
Truck Cargo 22.5-ton, 10X10, (LVSR)	D0886	7	
Truck, Tractor, 10X10 (LVSR)	D0887	5	
Truck, Ambulance, 4-Litter, Armored, 2 1/4-ton, HMMWV	D1001	15	
Truck, Ambulance, 2-Litter, Soft Top, 2 1/4-ton, HMMWV	D1002	15	
Truck, RTAA, XLWB Cargo, 7-ton, W/O Winch	D1062	12	
HIMARS, Armored Resupply Vehicle, Non-Reducible	D1063	9	
Truck, RTAA, Dump, 7-ton, W/O Winch	D1073	9	
Truck, Wrecker, 10X10 (LVSR)	D1214	6	
Ordnance & Weapons			
Saber System	E0055	7	
Javelin	E0207	7	
Equipment Set, Night Vision	E0330	28	
Howitzer, Lightweight, Towed, 155mm	E0671	9	
Assault Amphibious Vehicle (AAV), Command	E0796	43	
Assault Amphibious Vehicle, Personnel	E0846	43	
Assault Amphibious Vehicle, Recovery	E0856	43	
Launcher, Rocket, Assault, 83mm	E0915	35	
Launcher, Tubular, F/GM TOW Weapon System	E0935	31	
Light Armored Vehicle (LAV), Anti-Tank	E0942	26	
LAV, Command & Control (Battalion)	E0946	17	
LAV, Light Assault, 25mm	E0947	23	
LAV, Logistics	E0948	20	
LAV, Mortar	E0949	25	
LAV, Maintenance/Recovery	E0950	31	
Recovery Vehicle, Full-tracked, Heavy, W/Equip	E1378	10	
Rocket System, Artillery, High Mobility (HIMARS)	E1500	9	
Tank, Combat, Full-tracked, 120mm Gun	E1888	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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2019 would be expected to arrive in RC inventories in FY 2020 or FY 2021. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
M7 Rifle Optics	$4,505,823		
H-1 Advanced Boresight Equipment	1,500,000		
Intelligence Analysis System (IAS) Tier III Intelligence Workstation (IW)	1,001,325		
F-5 Tactical Combat Training System (TCTS) Pods	492,852		
FY 2018 NGREA Equipment			
F-5 N/F Martin Baker MK - 16 Ejection Seat		$4,100,000	
RQ-21A Mission Training Device		65,000	
RQ-21A Production Spares Pack-up		4,180,000	
AH-1Z Flight Trainig Device (FTD) Initial Spares Package		1,250,000	
Raidio Set, AN/PRC-117G		3,405,000	
FY 2019 NGREA Equipment			
Mobile Integrated Remains Collection System (MIRCS)			$6,825,000
F/A-18 SimuStrike Low Cost Trainer			2,400,000
HD-9 Visual Database Upgrade F/A-18 TOFT Trainer			1,900,000
F/A-18 Brief/Debrief Station (BDS)			900,000
Footprint Reduction / Storage Area Network (FR/SAN) for Aviation Training Systems			850,000
Initial Spares Package for F/A-18 TOFT Trainer			125,000
Total	**$7,500,000**	**$13,000,000**	**$13,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Aircraft, Refueling/Cargo, KC-130T	KC-130T	-4	-6	-2	Pending KC-130T sundown plan.
Helicopter, Attack, AH-1W	AH-1W	-11	-19		AH-1W reductions per the proposed platform sundown plan.
Equipment Set, Night Vision	E0330	-24			Item is scheduled to be removed from the inventory.
Launcher, Tubular, F/GM TOW Weapon System	E0935	-21			Item is scheduled to be removed from the inventory.

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Tilt-rotor, Cargo, MV-22B	MV-22B	12	6				
Helicopter, Utility, UH-1Y	UH-1Y	3	3				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Weapons and Combat Vehicles							
Assault Amphibious Vehicle (AAV7A1) Product Improvement Program (PIP)				$356,000	$352,000		
LAV PIP				0	37,000,000		
155mm Lightweight Towed Howitzer				340,000	337,000		
High Mobility Artillery Rocket System				2,869,000	2,840,000		
Weapons and Combat Vehicles under $5M				123,000	123,000		
Modification Kits				490,000	189,000		
Guided Missiles and Equipment							
Javelin				152,000	152,000		
Anti-Armor Weapons System-Heavy (AAWS-H)				117,000	116,000		
Communications and Electronics Equipment							
Unit Operations Center				1,206,000	1,194,000		
Common Aviation Command and Control System (C				2,479,000	0		
Repair and Test Equipment				1,209,000	0		
Items under $5M (Communications & Electronics)				47,000	39,000		
Radar Systems				5,427,000	3,102,000		
Fire Support System				1,667,000	500,000		
Intelligence Support Equipment				825,000	825,000		
Common Computer Resources				9,000	9,000		
Command Post Systems				3,071,000	53,000		
Radio Systems				12,583,000	116,000		
Communications Switching & Control Systems				3,117,000	312,000		
Support Vehicles							
Motor Transport Modifications				940,000	931,000		
Family of Tactical Trailers				1,018,000	1,257,000		
Engineer and Other Equipment							
Environmental Control Equipment				94,000	0		
Bulk Liquid Equipment				68,000	65,000		
Tactical Fuel Systems				9,000	59,000		
Power Equipment Assorted				2,225,000	3,000		
Container Family				720,000	0		
Family of Construction Equipment				1,819,000	1,322,000		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Items less than $5M (Engineer and Other Equipment)				208,000	0		
Spares and Repair Parts				1,023,000	505,000		
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Visual Database Development for AH-1Z and UH-1Y Flight Training Devices						$2,693,656	$2,693,656
Radio Set, AN/PRC-117F(V)						2,003,850	2,003,850
Video Terminal, Multi (Video Scout)						1,311,000	1,311,000
Laser Designator, AN/PEQ-19 (JTACLTD)						901,800	2,926,591
Global Combat Support System-Marine Corps (GCSS-MC) Mobile Training Suite						871,000	508,046
Directional Laser, LA-9/P						366,380	0
Man Portable Video Downlink (MPVDL)						200,651	0
Tactical Handheld Radio (THHR), AN/PRC-152(V)1						182,400	0
Very Small Aperture Terminal (VSAT) - Large						295,000	0
Very Small Aperture Terminal (VSAT) - Small						240,000	0
Common Laser Rangefinder, AN/PEQ-13						262,360	262,360
Counterintelligence and Human Intelligence Equipment Program (CIHEP) Media Exploitation Suite (Light)						230,000	230,000
Laser Transmitter						161,700	0
Thermal Sight, AN/PAS-25						90,000	0
Radio Set Single Vehicle Adapter, AN/VRC-112						77,760	0
Night Vision Goggles (NVG) Mounting Device						38,500	38,500
Aircraft Tire Bead Breaker						25,794	0
Cable Kit, Fiber Optic						22,152	0
Tool Kit, Fiber Optic						14,348	14,348
Tool Kit MTVR/LVSR, Hydraulic						11,649	11,649
Total				**$44,211,000**	**$51,401,000**	**$10,000,000**	**$10,000,000**

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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 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 2020 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 prioritized (PR) shortage list for major equipment items required for wartime missions but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	KC-130J Aircraft	28	21	$92,152,561	$1,935,203,781	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 7 aircraft delivered.
2	KC-130J Weapons Systems Trainer (WST)	2	1	$33,267,089	$33,267,089	The WST provides the most realistic simulation training available and gives Marine pilots the opportunity to train in a variety of scenarios to hone their skills. Devices are integral to conversion training and achieving systems profiency prior to delivery of aircraft.
3	KC-130J Fuselage Trainer (FuT)	2	1	$17,078,182	$17,078,182	A FuT is needed to provide training for new systems and to cover all crewmaster training tasks. Devices are integral to conversion training and achieving systems profiency prior to delivery of aircraft.
4	KC-130J Cockpit Procedures Trainer (CPT)	2	1	$4,937,258	$4,937,258	CPTs accomplish early stage training at a fraction of the cost and limit requirements placed on the WST. Devices are integral to conversion training and achieving systems profiency prior to delivery of aircraft.
5	KC-130J Observer Training Aid (OTA)	2	1	$3,278,158	$3,278,158	The Observer Training Aid (OTA) training device will be utilized to achieve (14) of the (19) Mission/Skill Sets for the EACTS. Without the OTA device, all training must be performed on the actual aircraft. Lack of the OTA will adversely impact the maintenance and operational readiness of USMC KC-130J squadrons and flight crews.
6	Mobile Integrated Remains Collection System (MIRCS)	12	12	$525,333	$6,304,000	The RC Personnel Retrieval and Processing Company currently does not possess the MIRCS consistent with DoD standards and doctrinal employment of Mortuary Affairs Collection Point (MCAP) operations which has degraded the unit's ability to conduct Mission Essential Tasks.
7	F/A-18 Training Simulators	3	3	$2,000,000	$6,000,000	The SimuStrike Low Cost Trainer is a fully configurable flight simulator that provides low cost, high fidelity flight training. The system can be networked with other devices and offers lower procurement and operating costs while maintaining a highly realistic training experience.
8	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.

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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	F-5 N/F Cockpit upgrades	12	12	$3,500,000	$42,000,000	The F-5 is the DoN's only tactical jet without basic safety features and is flown in some of the most dynamic roles. The current cockpit instrumentation not only lacks basic safety features but also has extreme obsolescence and sustainment challenges which will increasingly degrade F-5 readiness. Upgrading the old/obsolete instrumentation and adding required safety features will avoid degraded readiness and mitigate mishaps.
10	F-5 N/F Simulator	1	1	$9,000,000	$9,000,000	The forthcoming F-5 cockpit upgrades necessitate a representative simulator due to significant changes to pilot instrument scan and NATOPS emergency procedures. The two existing simulators are both located at Navy squadrons and are in the legacy cockpit configuration. A new simulator will facilitate new pilot training, streamline currency requirements, and provide a dedicated training platform for Marine Corps F-5s.

Chapter 4
United States Navy Reserve (USNR)

I. Navy Overview

A. Navy Planning Guidance

As competition accelerates in the maritime domain, the U.S. Navy must rapidly create a larger and more powerful fleet that incorporates cutting edge technologies and new operational concepts. Speed, agility, and urgency are necessary attributes of this effort. As part of the Navy Total Force, Reserve sailors provide operational capabilities, strategic depth, and the capacity to surge quickly wherever and whenever the nation requires. The Navy Reserve must be combat-ready to deliver operational excellence in support of a more lethal and capable force. Our skills—both military and civilian—will be needed for the Navy to prevail across the full spectrum of its enduring functions of deterrence, power projection, sea control, and maritime security, and to continue fulfilling fleet and combatant commander requirements around the world every day.[1]

Navy Reserve's number one guiding principle is warfighting. It is a ready and lethal military force, maximizing value to the nation by modernizing the way we do business. The Navy Reserve works hard to efficiently and effectively support the Active Component (AC), while making optimal use of talented Reserve sailors to increase Total Force capability. We develop sailors who are "Ready-to-Win." This concept accelerates the impact of Navy Reserve's mission in the new competitive global environment, through four key focus areas:

- Resourcing the manning, training, and equipment that delivers Navy Reserve capabilities.
- Leveraging Reserve sailors' civilian skills and partnerships with industry and academia.
- Enabling sailors to more effectively provide warfighting capabilities via innovative application of technology and supportive policies.
- Simplifying the way Reserve sailors support the fleet.[2]

The Navy Reserve will preserve strategic depth and deliver relevant operational capability to rapidly increase the agility and lethality of the Total Force.[3] Aligning and fully resourcing the Navy Reserve is absolutely critical to readiness and successful mission accomplishment.

B. Navy Equipping Policy

DoD instruction 1225.06[4] 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. Priorities for distribution of equipment should be given to

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[1] *Navy Reserve Action Plan*, January 2018, p. 2.
[2] Chief of Navy Reserve Statement, Hearing before the Senate Appropriations Committee Subcommittee on Defense, April 17, 2018, p. 3–4.
[3] *Navy Reserve Action Plan*, January 2018, p. 2.
[4] *Equipping the Reserve Forces*, May 16, 2012, p. 2.

units scheduled for deployment. Equipment priorities for Reserve Component (RC) units will be determined with the same methodology as AC units with the same mobilization mission and following Chief of Naval Operations (CNO) established guidance.

C. Plan to Fill RC Equipment Mobilization Requirements

Reserve equipment allocation is planned and coordinated by the AC and plays a significant role in how the Navy executes its missions. The Navy Reserve maintains equipment as training or mobilization assets and, in many instances, deploys with AC equipment. In certain warfare areas, such as aviation, the RC maintains much of its own equipment for operational employment. Equipment requirements and shortfalls are identified during the resource allocation process, which the Navy then prioritizes.

D. Initiatives Affecting RC Equipment

In the *Navy Reserve Action Plan*, the Chief of Navy Reserve outlines three core principles that will guide Navy Reserve actions:

1. Warfighting: we will be a ready, lethal, and cost-effective force.

2. Innovation: we will be highly leveraged with industry experience and on pace with current and future technologies.

3. Teamwork: we will be a high performing team.[5]

In conjunction with these three core principles, the Chief of Navy Reserve outlines the way the Navy Reserve does business by focusing on four key areas: simplify, enable, leverage, and resource. Working together, the Navy and Navy Reserve have a number of ongoing initiatives to recapitalize or upgrade the P-8A Poseidon and C-130 Hercules aircraft; determine the way ahead for the adversary air mission; and continue procuring the 40-foot Patrol Boat (40PB) to replace the current 34-foot Patrol Boat (34PB) inventory. Specific examples are below:

- **P-8A Poseidon**: Operational RC support is critical during the ongoing AC transition from the P-3C Orion to the P-8A Poseidon. RC squadrons are scheduled to source the final P-3C Global Force Management deployment in FY 2020. These squadrons will then stand alert as the Major Combat Operation "Ready Reserve" force through FY 2022, which is dependent upon the P-3C Littoral Surveillance Radar System. There is no plan to extend the P-3C service life beyond Full Operational Capability of the P-8A Advanced Airborne Sensor as all RC squadrons have been scheduled for decommissioning. In August 2018, the Navy approved the need to recapitalize these RC squadrons with six P-8A aircraft each, but no funding was identified to fill the RC requirement. If resources are not made available through the Program Objective Memorandum (POM) process, the aircraft will be included on the Navy's Unfunded Priority List. These aircraft were identified as Navy Reserve's primary equipment shortage in the FY 2019 NGRER.[6]

[5] *Navy Reserve Action Plan*, January 2018, p. 4.
[6] *National Guard and Reserve Equipment Report for Fiscal Year 2019,* March 2018, p. USNR-8-1.

- **F/A-18 Hornet**: The two RC F/A-18 squadrons are the Navy's Strike Fighter Reserve and provide critical 4th Generation adversary support. By the end of FY 2019, the transition from older legacy F/A-18A to the slightly newer F/A-18C for both VFA-204 and VFC-12 will be complete. These aircraft offer a modest increase in capability and service life over the F/A-18A they replaced. Though on average five years younger than the F/A-18A, the capability gap between RC legacy F/A-18Cs and the AC F/A-18E Super Hornets is rapidly growing. These aircraft must be recapitalized in order to maintain strategic reserve and adversary capabilities. Current plans include AC F/A-18Es transitioning to RC in 2026/2027.

- **C-130T/KC-130T Hercules**: The C-130 is primarily used for personnel and cargo transport. To bridge the gap between legacy C/KC-130T and KC-130J recapitalization, the Navy Reserve will extend the life of 19 of 24 of its legacy airframes via the ongoing Avionics Obsolescence Upgrade program and through engine performance upgrades. Following the Navy Reserve C/KC-130T fleet grounding in 2017, Congress funded upgraded propeller assemblies in FY 2018 which provided an immediate answer for capability revival but did not address longer term needs under the Navy Unique Fleet Essential Airlift requirement these aircraft fulfill.

- **F-5 N/F Tiger II:** The F-5 is an inexpensive adversary platform used to prepare carrier air wings for deployment and to train Fleet Replacement Squadron student pilots in air-to-air combat. Investment in F-5 system upgrades (advanced electronic attack, a modern radar, an Infrared search and track system, etc.) would significantly increase the F-5's ability to provide threat representative air-to-air training to carrier air wings preparing for deployment, and to student pilots undergoing initial air-to-air training. Currently, this effort is solely supported by Navy Reserve's limited NGREA.

- **EA-18G Growler:** VAQ-209's organizational construct requires the RC to provide equivalent combat capability to AC squadrons, executing the same mission and deploying every two years. AC carrier-based VAQ squadrons began deploying with seven Growlers in March 2018. Expeditionary VAQ squadrons are scheduled to deploy with six Growlers in October 2020. The AC squadrons are slated to increase their aircraft inventory from five to seven aircraft during the FY 2018–FY 2023 timeframe. VAQ-209 is expected to receive a sixth aircraft in FY2020/2021 which will preserve expeditionary deployment capability.

- **HH-60H/MH-60S Seahawk**: HSC-85 is the Navy Reserve's only Helicopter Sea Combat (HSC) squadron and provides the Navy's only dedicated Special Operations Forces (SOF) support. Due to an average airframe age of 24 years and rising maintenance costs, Commander, Naval Air Force Reserve (CNAFR) will complete recapitalization of its HH-60Hs with MH-60S in FY 2019. The MH-60S offers lower operating costs, enhanced compatibility within the AC HSC community, and will play a crucial role in countering emerging threats while continuing to provide baseline SOF support capabilities.

- **Coastal Riverine Force (CRF)**: The CRF is the only force provider for seaward security across the joint force. With the current 34-foot patrol boat (34PB) reaching the end of 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 between 2018–2033 using Navy procurement and NGREA funding. Additional critical CRF equipment needs include

procurement of the patrol boat navigation simulators, tactical radios/radio base stations, and a Crew Serve Weapons simulator and a Small Arms simulator at Camp Lemonnier, Djibouti.

E. Plan to Achieve Full Compatibility between AC and RC

In a fiscally constrained environment, the Navy balances many competing priorities to include AC/RC compatibility. It is absolutely critical that the Navy and Navy Reserve make every effort to achieve interoperability, when possible, with the Total Force. This will ensure safe, effective, and efficient mission accomplishment. The following are several recent NGREA procurements allowing the RC to keep pace, promoting AC/RC compatibility: 40PBs, a Standard Navy Double-lock Recompression Chamber, MH-60R VHF Omni-Directional Ranging/Instrument Landing System (VOR/ILS), and an Undersea/Subsurface Remotely Operated Vehicle Suite. The Navy prioritizes equipment inventories, based on POM funding, to provide the most capable systems to meet mission requirements while minimizing the effects of equipment shortfalls.

II. Navy Reserve Overview

A. Current Status of the Navy Reserve

1. General Overview

Top Navy Reserve Focus Areas

- Aircraft recapitalization: P-8A, F/A-18E, KC-130J, Adversary Aircraft
- Modernizing key capabilities: MH-60S, Coastal Riverine Force (CRF) Patrol Boat (PB) fleet
- Keeping pace with capabilities that increase lethality: Unmanned Aerial Systems (UAS)

On any given day, 20 percent of the more than 58,000 strong Navy Reserve Force is operating and delivering critical support around the globe. To stay operationally lethal, the Navy Reserve must align with the AC. As stated by the Chief of Navy Reserve in congressional testimony before the Senate Appropriations Committee Subcommittee on Defense:

> "The Navy Reserve provides additional capacity and lethality to the Total Force. To maximize this capability, aircraft recapitalization is without question Navy Reserve's number one equipment priority—critically important to supporting the warfighter. Almost 16 years of increased operational tempo within a constrained procurement environment has taken its toll on the aircraft and equipment that RC sailors operate. Navy Reserve's integrated force structure depends on the ability to quickly and seamlessly assimilate with active units to execute the mission. Accordingly, Navy Reserve depends on the availability of modern, compatible hardware to support the AC fleet."[7]

The Navy Reserve provides 100 percent of the Navy's organic inter-theater logistics support mission and airlift capability with its C-40A and C-130T aircraft, fulfilling the Navy Unique Fleet Essential Airlift requirement. Two F-5 squadrons, together with RC F/A-18s and Contract Air Support provide approximately 50 percent of the Navy's total adversary support. In addition, the Navy Reserve has an integral role in Maritime Patrol and Reconnaissance with its P-3 aircraft and conducts a variety of fleet support missions with its rotary wing aircraft.

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

- In late FY 2017, Argentina declared that Armada de la República Argentina (ARA) SAN JUAN (S-42), a TR-1700 class submarine with 44 submariners onboard, was missing. Over the next two weeks, Undersea Rescue Command (URC), U.S. Naval Forces Southern Command, and units and ships from 18 countries around the world undertook the largest search and rescue (SAR) effort for a lost submarine in modern history. Less than 24 hours after being notified, URC and Commander, Submarine Squadron ELEVEN (CSS-11) responded with 116 personnel, including 41 Navy reservists from the Submarine Force RC and 365 tons of equipment.[8]

- Faced with FY 2018 Personnel Recovery/Casualty Evacuation capacity shortfalls, SECDEF tasked HSC-85 to redeploy its enduring forward deployed detachment to support Combined

[7] Chief of Navy Reserve Statement, Hearing before the Senate Appropriations Committee Subcommittee on Defense, April 17, 2018, p. 4–5.
[8] The Submarine Force Reserve Component Submarine Note, February 2018, Issue 7, p. 1, 4.

Joint Task Force-Horn of Africa (CJTF-HOA) requirements. During this six-month deployment, HSC-85 executed over 500 mishap-free combat flight hours and conducted four CASEVACs, enabling CJTF-HOA to meet its objectives. The short notice redeployment and re-mission from dedicated SOF support in Indo-Pacific Command to Personnel Recovery/Casualty Evacuation in U.S. Africa Command (AFRICOM) showcased HSC-85's high levels of experience and operational flexibility.

- VAQ-209 completed a 15 week Indo-Pacific Command deployment in support of Seventh Fleet with five EA-18G aircraft and nearly 200 personnel. While deployed to Guam and Japan, VAQ-209 executed 373 sorties over 770.6 flight hours, supporting three large force exercises involving joint and international forces, and numerous non-traditional Intelligence, Surveillance, and Reconnaisance (ISR) missions to include testing and evaluation of new systems.

- Reserve Force Maritime Patrol Squadrons VP-62 and VP-69 successfully completed their third six-month Partial-Unit mobilization to Kadena, Japan in April 2018. The two squadrons provided constant support to CTF-72 with over 80 personnel and three P-3C aircraft each. Six combat aircrews flew over 1,200 hours in support of Anti-Submarine Warfare and ISR operations throughout Indo-Pacific Command's Area of Responsibility. Both squadrons supported the Rim of the Pacific exercise and Homeland Defense detachments in Hawaii in 2018. An upcoming year-long LSRS deployment will begin in October 2019.

- The four Reserve F-5 and FA-18 fighter squadrons provide over 80 percent of the Navy's dedicated adversary or "Red Air" sorties. These sorties provide undergraduate level air-to-air combat training to emergent FA-18E and F-35C pilots and graduate level training to units preparing to deploy.

- VR-61 provided short-notice, emergency re-supply of 12,000 pounds of sonobouys from NAS Whidbey Island to NAS Comandante Espora (Argentina) for P-8 assets searching for a missing Argentinian submarine.

- Supporting Hurricane Maria recovery efforts, VR-56 transported 15,000 pounds of water, food, gas cans, a generator, and basic necessities to Naval personnel in Puerto Rico. VR-56 also evacuated 56 Navy personnel and their dependents from Puerto Rico to NAS Jacksonville, FL, and transported HM-14 and TACRON 21 personnel to Roosevelt Roads for humanitarian assistance operations onboard the USS Wasp (LHD-1).

a. Naval Air Forces Reserve

Naval Air Forces Reserve comprises three air wings, two Joint Reserve Bases, and one Naval Air Facility. Fleet Logistics Support Wing and Tactical Support Wing reside at Naval Air Station-Joint Reserve Base Fort Worth, TX, while Maritime Support Wing is headquartered at Naval Air Station North Island, CA. Naval Air Forces Reserve Joint Reserve Bases are in Fort Worth, TX, and New Orleans, LA, and the Naval Air Facility is in Washington, DC. In addition to these standalone commands, the Navy Reserve operates multiple Squadron Augment Units which directly support various AC Navy squadrons around the country. Navy Reserve owns and flies approximately 150 aircraft supporting the Navy Total Force.

The Naval Air Forces Reserve faces significant readiness challenges, largely due the age of aircraft currently in the inventory. Cost and length of depot repair, limited parts availability, and age-related unplanned maintenance are primary causes. The most affected platforms are C/KC-130T, F/A-18A-D, EA-18G, F-5F/N, and MH-53E aircraft.

i. Maritime Patrol and Reconnaissance Force (MPRF)

P-3C Orion: The RC operates two MPRF P-3C squadrons. Both squadrons support the following missions: anti-submarine warfare, anti-surface warfare, counter-transnational organized crime, ISR, homeland defense contingency operations, humanitarian assistance, and disaster relief support. RC P-3Cs are facilitating the AC P-8A Poseidon transition with operational support through the end of FY 2022. There are no plans to extend RC P-3C beyond FY 2022. An increased P-8A inventory requirement was validated in summer 2018 and the RC was approved to transition in October 2018. However, no aircraft have been identified for the Navy Reserve, leading to a second year as the Navy Reserve's most significant major item shortage (see *Table 8*).

Navy desires to source six aircraft for each RC squadron as resources become available. If the RC squadrons are deactivated, the MPRF community loses strategic depth and surge capacity; the Navy loses the sizeable investments and assets created as Naval aviators depart active duty. The Navy Reserve's MPRF squadrons are VP-62 based at NAS Jacksonville, FL, and VP-69 at NAS Whidbey Island, WA, respectively.

ii. Fleet Air Logistics

The Fleet Logistics Support Wing (FLSW) provides 100 percent of the Navy's organic, global intra-theater airlift capability for the Fleet and for Combatant Commands under the Navy Unique Fleet Essential Airlift requirement. FLSW consists of 12 squadrons and two executive transport detachments that operate C/KC-130T, C-40A, C-20G, and C-37A/B aircraft.

C/KC-130T Hercules: The current C/KC-130T inventory consists of 24 aircraft (19 C-130T and 5 KC-130T) operated by VR-53 at Joint Base Andrews, MD; VR-54 at NAS Joint Reserve Base New Orleans, LA; VR-55 at NAS Point Mugu, CA; VR-62 at NAS Jacksonville, FL; and VR-64 at McGuire Air Force Base, NJ.

Due to its short field takeoff and landing and oversize payload carrying capabilities, the C/KC-130T is the most requested Navy Reserve aviation asset. The Fleet Logistics Support Wing suffered major readiness impacts when the C/KC-130T fleet was grounded in 2017.[9] At great cost to planned service life, Navy C-40As operated at maximum capacity to support lost lift capability and capacity until Congress supplemented funding for NP-2000 propeller upgrades. This effort enabled a return to service plan for the entire fleet, but did not address longer term recapitalization. The grounding, compounded with aircraft age and obsolescence issues, led to systemic readiness deficiencies for both aircraft and aircrew. Recent NGREA purchases, including carbon brakes, simulator modernization and upgraded GPS units, have limited these deficiencies. Current initiatives include the ongoing Avionics Obsolescence Upgrade (AOU) and

[9] Congressional Testimony, Chief of Navy Reserve, April 2018.

engine performance upgrades. Efforts are underway to recapitalize the C/KC-130T fleet with 24 KC-130J at a cost of $2.3 billion.

Until recapitalization occurs, sustainment will focus on correcting degradations and rebuilding readiness to support the warfighter. C/KC-130T sustainment and modernization is critical to preserving Navy's organic lift capability and fulfilling the NUFEA requirement.

C-40A Clipper: The C-40A is a modified Boeing 737. Delivery of the final two aircraft, which were funded via congressional add in FY 2017, is scheduled for FY 2019. The C-40A fleet operated at maximum capacity to meet Navy Unique Fleet Essential Airlift demands during 2017 and 2018 following the C/KC-130T grounding, supporting enduring operational requirements, hurricane relief efforts to the Gulf Coast and Puerto Rico, and search efforts for the ARA San Juan—the missing Argentine submarine.

Procurement of the final two C-40As, begun in 1997 and funded with a combination of base budget, NGREA and congressional add, completes the risk-reduced red line requirement of 17 aircraft (full requirement is 23 aircraft). These much larger 737-derivative aircraft replace the C-20G Gulfstream IVs and will be delivered to VR-51, residing at Marine Corps Air Station (MCAS) Kaneohe Bay, HI. Efforts are ongoing to identify funding to support renovation or construction of a hangar at MCAS Kaneohe Bay. Existing airfield and temporary facilities are unable to fully enclose a C-40A. Until an adequate hangar exists, periodic maintenance will be conducted at a continental United States (CONUS) squadron's facilities, impacting C-40A operations and readiness. Recent NGREA purchases addressed safety concerns, including improved backup instrumentation and enhanced weather radar.

C-40A Clippers are operated by VR-56 at Naval Air Station (NAS) Oceana, VA; VR-57 at NAS North Island, CA; VR-58 at NAS Jacksonville, FL; VR-59 at NAS Joint Reserve Base (JRB) Forth Worth, TX; and VR-61 at NAS Whidbey Island, WA. The final two C-40As are scheduled for delivery to VR-51 at MCAS Kaneohe Bay, HI.

C-37A/B and C-20G: The Navy Reserve operates one C-20G and four C-37A/B executive transport aircraft. One C-37B received funding in FY 2018 for badly-needed interior refurbishment. Additional funding is required to complete refurbishment of the remaining three C-37A/Bs. FY 2019 NGREA was used to outfit the one C-37A with C-37B compatibility and safety equipment. The Navy Reserve C-20G will reach the end of service life in the next few years. VR-1 is based at Joint Base Andrews, MD, operating the C-37B, with two forward-deployed Executive Transport Detachment sites located at Joint Base Pearl Harbor-Hickam, HI, and NAS Sigonella, Italy, operating the C-37A and C-20G respectively.

iii. Tactical Aviation

The Tactical Support Wing (TSW) provides expeditionary Airborne Electronic Attack, a strategic reserve for the Navy's carrier air wings and adversary training. TSW's greatest shortfall is readiness. Both RC F/A-18 squadrons are transitioning to 25+ year old AC C/D series from 32-year old A+/B series F/A-18s. Despite being new to the RC, they will be challenged to meet an 80 percent mission capable rate goal. Mission capable rates for each platform in the TSW are currently below 50 percent. Cost and length of depot repairs, limited parts availability and age-related unplanned maintenance are the primary concerns.

TSW is comprised of five squadrons: one VAQ (EA-18G), one VFA (F/A-18), and three VFC (F/A-18 and F-5F/N).

F/A-18 Hornet: Navy Reserve F/A-18 squadrons provide a critical strategic reserve strike fighter capability when able to augment deployed carrier air wings. Recently transitioned from the AC, legacy F/A-18C/Ds will no longer fulfill a strategic reserve requirement as they will be unable to deploy on CVNs past 2020. F/A-18E/F or F-35C would allow the RC to support the Navy's future strike fighter warfare requirements.

The FY 2019 NDAA directed the Secretary of the Navy to provide a brief to the House Committee on Armed Services on its updated plans to recapitalize the Navy Reserve combat air fleet by December 2018. This report reaffirmed the plan to transition, termed "waterfall," the RC into F/A-18E Super Hornets once the AC procures enough new F/A-18Es and F-35s to shed its early block Super Hornets. This is expected to occur in FY 2026/2027.

These two squadrons are the Navy's only dedicated advanced adversary squadrons, however, they lack the capacity and capability to fully meet fleet adversary requirements. As a result, AC F/A-18s provide approximately 50 percent of the Navy's total adversary support, which consumes approximately two AC Super Hornets per year in adversary flight hours flown. Recapitalizing the two RC squadrons with F/A-18Es ahead of the "waterfall" schedule would allow the Navy Reserve to meet capability requirements, decrease the adversary capacity deficit, and improve fleet aircraft longevity and aircrew readiness. Recent NGREA purchases include simulator upgrades and Electronic Attack pods.

The Navy Reserve F/A-18 squadrons are VFA-204 at NAS JRB New Orleans, LA, and VFC-12 at NAS Oceana, VA.

F-5 Tiger II: Highly experienced fighter pilots operate 31 Navy Reserve F-5 Tiger II aircraft (29 F-5N and 2 F-5F). However, adversary capabilities have evolved to the point the F-5 is no longer able to properly simulate advanced air-to-air threats. Upgrades to the current inventory, as well as procurement and upgrade of additional aircraft would decrease the capacity and capability gaps. Procurement of additional F-5s offers a cost-effective solution to increase sortie capacity at a fraction of the cost of modern fighters—saving service life on the two AC Hornets' worth of adversary support hours. At end of FY 2018, some Swiss F-5s became available and the Navy is investigating their condition and evaluating feasibility of their procurement. Recent NGREA purchases include upgraded ejection seats, electronic attack pods, and F-5 protective equipment on the NAS Key West flight line.

Navy Reserve F-5s are flown at VFC-13 at NAS Fallon, NV, and VFC-111 at NAS Key West, FL.

EA-18G Growler: The EA-18G provides full-spectrum Airborne Electronic Attack to counter enemy air defenses and communication networks, including the ability to employ anti-radiation missiles. Combatant commander demand for electronic attack capability has increased due to the sundown of Marine EA-6B Prowlers in 2019, the enhanced capabilities of threat surface-to-air missile systems globally, and the proven versatility of the EA-18G Growler. The Navy Reserve's Airborne Electronic Attack squadron, VAQ-209, mitigates the Navy's capacity and capability

gaps and provides a formidable operational and strategic reserve capability. The squadron is scheduled for Global Force Management Allocation Plan (GFMAP) deployments in FY 2020 and FY 2022. VAQ-209 is expected to receive a sixth aircraft in FY 2020/2021 which will preserve the squadron's expeditionary deployment capability.

VAQ-209 operates out of NAS Whidbey Island, WA.

iv. Rotary-Wing Aviation

Navy Reserve helicopter squadrons perform a variety of fleet support missions including anti-submarine warfare, anti-surface warfare, counter-transnational organized crime, search and rescue, maritime interdiction operations, dedicated rotary-wing support to SOF, and airborne mine countermeasures (AMCM). The RC operates two helicopter squadrons, two Tactical Support Units (TSU) in support of the Navy Reserve's rotary-wing fleet, and resources two blended AC/RC helicopter squadrons.

HH-60H/MH-60S Seahawk: In 2016, the Navy reorganized the Navy Reserve's dedicated rotary-wing support to SOF into one squadron and two TSUs. Created upon HSC-84's disestablishment, the TSUs retain RC expertise in rotary-wing support to the SOF mission. They incrementally increase the Navy's overall SOF-support capability through integration with HSC fleet squadron training syllabi and readiness programs, while also offering deployable surge capacity contingencies worldwide. HSC-85 has flown thousands of hours in support of training and SOF combat operations in Indo-Pacific Command and AFRICOM AORs. HSC-85 is expected to finish its transition into the MH-60S in FY 2019. In order to retain COCOM-requested capabilities that the HH-60H had, HSC-85's MH-60S will require several upgrades. FY 2019 NGREA has been leveraged for most upgrades, but funding will still be required for further modifications. HSC-85 is based at NAS North Island, CA with two, TSUs embedded at the Helicopter Sea Combat (HSC) Wing Weapons Schools at NAS Norfolk, VA (TSU Atlantic), and NAS North Island, CA (TSU Pacific).

MH-60R Seahawk: HSM-60, the Navy Reserve's only helicopter maritime strike squadron, is tasked to support fleet requirements including ASW, ASU, counter transnational organized crime operations, SAR, and MIO missions. The Navy Reserve applied FY 2018 NGREA funds to accelerate MH-60R VOR/ILS more than a decade ahead of installation schedule. HSM-60 operates MH-60Rs at NAS Jacksonville, FL.

MH-53E: The RC is responsible for personnel and equipment associated with seven MH-53E helicopters in support of two composite AC/RC AMCM squadrons. HM-14 and HM-15 comprise 100 percent of the Navy's AMCM capability. RC personnel provide critical operational support for forward-deployed MH-53E detachments in the U.S. Central Command (CENTCOM) and U.S. Pacific Command areas of responsibility. In the event AMCM is extended beyond FY 2025, funding will be required to provide engine upgrades to the MH-53E fleet. HM-14 and HM-15 are based at NAS Norfolk, VA.

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 which 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.

i. Coastal Riverine Force

The Navy Reserve CRF 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 CRF conducts rotational deployments in support of AFRICOM and CENTCOM. It also provides mission-enabling augmentation to AC Coastal Riverine Squadrons as required. The most critical CRF equipment need is the 40PB. The 34PBs have approached critical maintenance and service life issues, requiring ever-increasing maintenance and CMAV/overhaul scheduling to meet mission requirements, increasing risk to personnel and readiness. The recapitalization plan is to procure 120 40PB for AC/RC over a 15-year period between 2018–2033. 40PB procurement commenced in FY 2017 with the AC purchasing 10 boats using POM funding. In FYs 2018 and 2019, the AC purchased another 10 platforms and RC purchased four additional using NGREA, collectively totaling 38 boats being purchased to date. Each RC Coastal Riverine Squadron (CRS) has geographically dispersed subordinate companies and high value unit protection detachments. The RC CRF consists of four CRS: CRS 1 at San Diego, CA; CRS 8 at Newport, RI; CRS 10 at Jacksonville, FL; and CRS 11 at Seal Beach, VA.

ii. Naval Construction Force (NCF)

Navy Reserve NCF units provide a wide range of capability in support of Navy and joint forces, including the construction of bridges, airfields, airfield damage repair, 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. Funding is required to upgrade command C4I equipment, tactical data networks, and radio communication systems. Development of port and airfield damage repair capabilities in support of operational plan requirements will require additional investment to ensure compatibility with active NCF forces. Gulfport, MS, is home to 7th NCR, NMCB 14, and NMCB 27. 1st NCR, NMCB 18, NMCB 22, and NMCB 25 are homeported in Port Hueneme, CA.

iii. Navy Expeditionary Logistics Support Group (NAVELSG)

NAVELSG is a vital enabler of Maritime Prepositioning Forces (MPF), Joint Logistics Over the Shore (JLOTS) operations, and maritime forces ashore providing expeditionary cargo handling services for surface, air, and terminal operations, tactical fueling, and ordnance handling/reporting in support of worldwide Naval, Joint, interagency, and combined forces/organization. The Navy Reserve accounts for over 90 percent of NAVELSG forces. NAVELSG consists of three Navy Expeditionary Logistics Regiments (NELR) and six Navy Cargo Handling Battalions (NCHB). The 2nd NELR is located in Williamsburg, VA; the 4th NELR in Jacksonville, FL; and the 5th NELR in Port Hueneme, 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 (ACB), Naval Beach Master Units, and Assault Craft Units. Additionally, RC sailors provide critical sustained operational support to worldwide surface deployments through the recently developed RC to Sea initiative.

i. Navy Reserve LCS Community

The Navy Reserve 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 SELRES. To support their mission, RC LCS units require fire arms training simulators for proficiency and various SAR, ATFP, and VBSS equipment for real world operations. FY 2019 NGREA purchased fire arms simulators, SAR, ATFP, and VBSS gear necessary to support AC missions. LCS Reserve Squadrons (LCSRON) have multiple units across 15 locations with LCSRON ONE HQ at San Diego, CA, and LCSRON TWO HQ at Mayport, FL.

ii. Naval Beach Group

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 ten Maritime Prepositioning Force Utility Boats in five different locations for training, assault follow-on echelon offload mission support, and several other homeport support requirements. Currently, NBG requires additional Improved Navy Lighterage Systems for the training of Navy reservists for deployment. NGREA will be considered for the purchase of these systems in the near future. NBG-1 is located in Coronado, CA, and NBG-2 is located in Little Creek, VA.

d. Naval Special Warfare (NSW)

NSW RC provides over 10 percent of Naval Special Warfare (NSW) world-wide deployed capability. The RC is charged with training, equipping, and mobilizing deployment-ready forces to support NSW and Joint SOF requirements while also ensuring robust strategic reserve. The enduring NSW operational support requirement is accomplished by NSW RC detachments fully integrating with AC NSW Groups and their deployed Special Operations task forces and task groups.

The NSW RC provides 33 percent of NSW's sustained organic Unmanned Aerial Systems (UAS) capability. To ensure its Special Operators and Combat Service Support personnel are ready to support NSW AC, the NSW RC uses advanced weapons, communication, ISR collection and processing, and operator survival capabilities to maintain a high state of readiness prior to mobilization. This equipment includes advanced medical treatment training systems,

weapons training, and protective gear to meet the high standards for NSW RC personnel to quickly and effectively integrate with their active duty counterparts in hybrid AC/RC units for final unit-level training and deployment. NSW Group 11 and Seal Team 17 is located at San Diego, CA, and Seal Team 18 is located at Virginia Beach, VA.

e. Military Sealift Command (MSC)

Military Sealift Command 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. In FY 2019, NGREA funds were used to purchase cargo handling equipment necessary to offload sealift vessels in-port and at-sea. MSC is represented by five geographic area commands (Atlantic, Pacific, Europe, Middle East, 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 work in providing assistance to rescuing sailors from distressed undersea platforms. In FY 2018, the Navy Reserve used NGREA to procure the standard Navy Double-Lock Recompression Chamber, a vital system necessary for this mission area. 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 old equipment, particularly aircraft, there is a compelling need to recapitalize or modernize the Navy Reserve's oldest assets. The Navy Reserve's primary concerns are P-3C (~36 years old) and F/A-18A+ aircraft (~32 years old) that operate at a significantly higher cost, produce lower readiness rates, and provide less capability than their projected replacement platforms.

There are no plans to fund P-3C sustainment after the AC patrol squadrons have completed the transition to the P-8A. RC P-8A recapitalization efforts are underway, though funding has yet to be identified.

According to GAO-18-678, Navy EA-18s and F/A-18s have not met availability goals. Legacy hornets (F/A-18A-D) are operating beyond planned service life and suffer from maintenance and supply issues. The Navy has conducted service life extension, authorized overtime maintenance work, and cannibalized parts in an effort to keep existing aircraft mission capable.

In accordance with a report due to Congress in December 2018 directed by the FY 2019 NDAA, the Navy plans to address the RC fighter capability shortfall through a "waterfall" process in which F/A-18C/D and eventually F/A-18E aircraft are to be transferred to the RC. This is dependent upon timely AC recapitalization to F/A-18E and F-35 and improved depot throughput, though it does not preserve strategic reserve capability on the current timeline. To ensure the Navy Reserve can support requirements, the Navy will need to make future investments in RC equipment. *Table 2 Average Age of Equipment* provides the average age of major equipment.

c. Compatibility of Current Equipment with the AC

Navy Reserve equipment requires compatibility with the AC to support applicable Navy assigned missions. Achieving equipment compatibility with the AC is critical to ensuring the Navy Reserve has the ability to train to the same standards and can be ready to seamlessly operate with AC counterparts. While procurement and upgrade programs, congressional adds, and NGREA funds have helped improve RC equipment capability and compatibility, significant challenges still remain. For example, VFA-204 is the Navy Reserve's only strategic strike/fighter reserve squadron. Despite transitioning to AC F/A-18C/D, VFA-204 will be unable to fulfill its strategic reserve role because it will be unable to deploy on the aircraft carrier beyond FY 2020. The aircraft carrier will be unable to provide the logistic support for the legacy platform after that date. *Table 8 Significant Major Item Shortages* provides the equipment recapitalization priorities of the Navy Reserve.

d. Maintenance Issues

Navy Reserve equipment maintenance continues to remain a high priority. Due to Navy budgetary constraints, depot throughput limitations, and high operations tempo, both the AC and the RC are confronted with maintenance shortfalls and backlogs. The high operational tempo of the Navy Reserve has accelerated equipment degradation and service-life expenditure. Maintenance issues most significantly affect RC C/KC-130T, F-5F/N and F/A-18A-D. Of those listed, F-5s are the only aircraft that may be able to make the Secretary of Defense's mission capable goal of 80 percent. Navy Reserve C-130s and legacy F/A-18s (F/A-18A-D) suffer from long and costly depot maintenance periods, a lack of qualified maintainers, service-life-related issues and lack of repair parts due to obsolescence. Modern replacement assets such as the P-8A, F/A-18E, KC-130J, and 40PB would reduce maintenance issues and produce significant maintenance cost avoidance, as well as increasing fleet support with reliable aircraft.

e. Modernization Programs and Shortfalls

The Department of the Navy maintains a prioritized list of unfunded equipment, which is used to inform development of the Unfunded Priority List (UPL). When directed, the CNO forwards the UPL to Congress for resourcing consideration. The Navy Reserve's top-ten 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 publication of the FY 2019 NGRER.

- Transition into F/A-18 C/D is projected to be complete by the end of FY 2019.
- In October 2018 the Navy approved the plan to recapitalize VP-62 and VP-69 from P-3C to P-8A in support of a validated increased inventory requirement.
- In CY 2018, VR-51's two C-20G aircraft were stricken from the Navy inventory, in preparation for receipt of C-40A #16 and #17 during FY 2019.
- HSC-85 will complete transition from HH-60H to MH-60S by the end of FY 2019.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements identifies major equipment requirements and on-hand inventories projected from FY 2020 to FY 2022.

2. Anticipated New Equipment Procurements

In FY 2018, Congress appropriated $65 million in NGREA for the Navy Reserve. This funding is being used for major improvements to existing capabilities and critical safety upgrades that will enhance the survivability of Navy personnel and equipment. *Table 4 NGREA Procurements* provides the list of these purchases.

3. 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 FY 2019 and FY 2020 NGRER:

- An inventory of 26 F/A-18C and nine F/A-18D are projected to be transferred to the Navy Reserve by the end of FY 2019.
- 11 MH-60S are projected to complete transfer to HSC-85 by the end of FY 2019.
- Two C-40As are projected to be delivered in FY 2019 and the two C-20Gs will be stricken.

4. Remaining Equipment Shortages and Modernization Shortfalls at the End of FY 2022

Aircraft recapitalization is the Navy Reserve's number one equipment priority. Almost 16 years of increased operational tempo within a constrained procurement environment has taken its toll on the aircraft and equipment the RC sailors operate. The Navy Reserve depends on the availability of modern, compatible hardware to support the AC fleet. *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 2022.

D. Summary

In order to become a more lethal Navy Reserve and win the great power competition with our adversaries, the Navy Reserve must continue to modernize key capabilities. Despite challenges caused by a continued strained fiscal environment, America's Navy Reserve stands ready. The Navy Reserve's proud citizen sailors continue to carry on the tradition of supporting the Navy, Marine Corps, and joint force wherever and whenever called to serve. The Navy Reserve will continue to ensure our warfighters are prepared for war and have the tools needed to effectively and efficiently accomplish the mission. By recapitalizing our aging aircraft, we will increase overall readiness and become a more lethal warfighting force.

USNR

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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Aircraft							
Aircraft, Transport, C-40A (Boeing 737-700)	C-40A	$85,100,000	17	17	17	17	17
Aircraft, Transport, C-130T (Hercules)	C-130T	$58,900,000	19	19	19	19	19
Aircraft, Transport, KC-130T (Hercules)	KC-130T	$66,000,000	5	5	5	5	5
Aircraft, Transport, C-20G (Gulfstream)	C-20G	$64,000,000	1	1	1	1	1
Aircraft, Transport, C-37A (Gulfstream)	C-37A	$66,300,000	1	1	1	1	1
Aircraft, Transport, C-37B (Gulfstream)	C-37B	$63,000,000	3	3	3	3	3
Aircraft, Patrol, P-3C (Orion)	P-3C	$109,900,000	12	12	12	12	12
Aircraft, Electronic Attack, EA-18G (Growler)	EA-18G	$79,500,000	5	5	6	6	6
Aircraft, Fighter/Attack, F/A-18C (Hornet)	F/A-18C	$77,400,000	30	30	30	30	30
Aircraft, Fighter/Attack, F/A-18D (Hornet)	F/A-18D	$77,400,000	5	5	5	5	5
Aircraft, Fighter, F-5F (Tiger II)	F-5F	$19,800,000	2	2	2	2	2
Aircraft, Fighter, F-5N (Tiger II)	F-5N	$2,700,000	29	29	29	29	29
Helicopter, ASW, MH-60R (Seahawk)	MH-60R	$37,700,000	7	7	7	7	7
Helicopter, NSW, MH-60S (Seahawk)	MH-60S	$26,200,000	11	11	11	11	11
Helicopter, Mine Warfare, MH-53E (Sea Dragon)	MH-53E	$56,100,000	7	7	7	7	7
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	3	3	3	3
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	$13,772,579	2	2	2	2	2
Naval Mobile Construction Battalion TOA	NMCB	$88,109,419	5	5	5	5	5
Naval Construction Regiment TOA	NCR	$15,915,455	2	2	2	2	2
Construction Capability Augment TOA	NCFCCA	$280,529,531	1	1	1	1	1
NAVCONTGRU Equipment	NCGEQP	$57,739,588	2	2	2	2	2

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Coastal Riverine Force (CRF)							
Squadron TOA Equipment	CORIVGRUSQ	$16,006,865	4	4	4	4	4
Coastal Riverine Company TOA	CORIV-CO	$23,484,005	16	16	16	16	16
MK VI Patrol Boat	MKVIPB	$14,100,664	5	6	6	6	6
Navy Expeditionary Logistics Support Group (NAVELSG)							
Navy Expeditionary Logistics Regiment TOA	NELR	$4,226,016	3	3	3	3	3
Navy Cargo Handling Battalion (Commercial) TOA	NAVCARGOBN (C)	$38,148,994	2	2	2	2	2
Navy Cargo Handling Battalion (Tactical) TOA	NAVCARGOBN (T)	$45,026,997	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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Aircraft			
Aircraft, Transport, C-40A (Boeing 737-700)	C-40A	11	
Aircraft, Transport, C-130T (Hercules)	C-130T	24	
Aircraft, Transport, KC-130T (Hercules)	KC-130T	29	
Aircraft, Transport, C-20G (Gulfstream)	C-20G	24	
Aircraft, Transport, C-37A (Gulfstream)	C-37A	16	
Aircraft, Transport, C-37B (Gulfstream)	C-37B	12	
Aircraft, Patrol, P-3C (Orion)	P-3C	37	
Aircraft, Electronic Attack, EA-18G (Growler)	EA-18G	9	
Aircraft, Fighter/Attack, F/A-18C (Hornet)	F/A-18C	27	
Aircraft, Fighter/Attack, F/A-18D (Hornet)	F/A-18D	27	
Aircraft, Fighter, F-5F (Tiger II)	F-5F	22	
Aircraft, Fighter, F-5N (Tiger II)	F-5N	39	
Helicopter, ASW, MH-60R (Seahawk)	MH-60R	8	
Helicopter, ASW, MH-60S (Seahawk)	MH-60S	10	
Helicopter, Mine Warfare, MH-53E (Sea Dragon)	MH-53E	26	
Aviation Simulators			
C-130T Simulator	C-130T SIM	29	
F-5 Simulator	2F213	9	
F/A-18C Simulator	2F193A	9	
Naval Beach Group			
Maritime Prepositioning Force Utility Boat	MPF-UB	7	
Naval Beach Group Table of Allowance (TOA) Equipment	NBG	3	
Naval Construction Force (NCF)			
Construction Battalion Maintenance Unit TOA	CBMU	10	
Naval Mobile Construction Battalion (NMCB) TOA	NMCB	10	
Naval Construction Regiment TOA	NCR	8	
Construction Capability Augment TOA	NCFCCA	11	
NAVCONTGRU Equipment	NCGEQP	11	
Coastal Riverine Force (CRF)			
Squadron TOA Equipment	CORIVGRUSQ	12	
Coastal Riverine Company	CORIV-CO	12	
MK VI Patrol Boat	MKVIPB	3	
Navy Expeditionary Logistics Support Group (NAVELSG)			
Navy Expeditionary Logistics Regiment Staff TOA	NELRHQ	10	
Navy Cargo Handling Battalion (Commercial) TOA	NAVCARGOBN (C)	10	
Navy Cargo Handling Battalion (Tactical) TOA	NAVCARGOBN (T)	10	

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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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2019 would be expected to arrive in RC inventories in FY 2020 or FY 2021. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
F-5 Ejection Seats	$13,440,625		
Navy Enterprise Tactical Command & Control 2 (NETC2) v2.0	9,816,000		
C-130T/2F107 Simulator Modernization	9,130,000		
NETC2 v2.0 Expansion Kit	1,136,000		
Expeditionary Surveillance Control Central Trailer Sensor Platform	880,000		
Fire Arms Training Systems (FATS)	720,000		
C-40A Weather Radar Upgrade	600,000		
Anti-terrorism/Force Protection (AT/FP) Visit, Board, Search, and Seizure (VBSS) SRX-2200 Radio	224,541		
60kW Advanced Medium Mobile Power Source (AMMPS)	150,000		
Neutrally Buoyant Ballistic Plate (NBBP) 10x12 Torso Plate	78,366		
K9 limited ARC explosive storage magazines	18,890		
Ear Defenders (NSN 4240-01-519-6066)	6,778		
C-130T GPS Units	1,298,800		
FY 2018 NGREA Equipment			
Force Protection Large / 40' Patrol Boats		$9,312,000	
C-130T Carbon Brake Upgrades		8,861,603	
NSW Operating Stock		7,385,730	
Tactical Communications Equipment		5,759,709	
F/A-18 Filthy Buzzard Pods		5,550,000	
F-5 Filthy Buzzard Pods		4,930,000	
RQ-21A UAS SURFR Payload Suite		3,600,000	
RQ-20 PUMA SATCOM Data Support Terminals		3,084,000	
C-40 Integrated Standby Flight Display		2,585,696	
F-5 Radar Display Units		2,469,775	
RQ-20A PUMA Small UAS		2,051,552	
LSSV-Maintenance Truck		1,726,840	
Standard Navy Double-Lock Recompression Chamber		1,509,650	
F/A-18 Simulator Visual Upgrade		1,471,000	
MH-60R VOR/ILS		1,414,000	
LSSV-Litter Carrier Truck		1,079,200	
FATS Trainers		984,735	
Conflict Kinetics Synthetic Marksmanship Training System		732,923	
Undersea/Subsurface Remotely Operated Vehicle Suite		366,099	
Mobile Training Suite		125,488	

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2019 NGREA Equipment			
F-5 Filthy Buzzard Pods			$16,175,000
F/A-18 Filthy Buzzard Pods			13,643,000
Force Protection Large / 40' Patrol Boats			9,600,000
Tactical Communications Equipment			8,372,179
Weapons Simulators			4,871,395
HSC-85 MH-60S Equipment			3,890,573
Cargo Handling Equipment			2,416,776
F/A-18 Simulator Visual Upgrade			1,514,000
Concrete Mixer			908,118
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			600,000
C-40A Weather Radar Upgrade			577,758
C-37A Safety Upgrades			191,000
Total	**$37,500,000**	**$65,000,000**	**$65,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Aircraft, Patrol, P-3C Orion	P-3C	-4	-4		Anti-Surface Warfare Improvement Prgram (AIP) variant
Aircraft, Patrol, P-3C Orion	P-3C	+4	+4		Block Modification Upgrade (BMUP) variant
Aircraft, Electronic Attack, EA-18G Growler	EA-18G		+1		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Helicopter, ASW, MH-60R (Seahawk)	MH-60R	2	2				
Helicopter, Combat SAR, HH-60H (Seahawk)	HH-60H	-24	-12				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Other Aircraft							
KC-130J				$216,665,000	$209,502,000		
Modification of Aircraft							
Adversary Aircraft				5,816,000	5,441,000		
H-53 Series				8,163,000	8,163,000		
C-130 Series				22,307,000	20,954,000		
Cargo/Transport Aircraft (A/C) Series				8,916,000	8,916,000		
Other Procurement							
Standard Boats				59,000	0		
Items Under $5M - Civil Engineering Support Equipment				1,241,000	1,241,000		
C4ISR Equipment				1,864,000	1,864,000		
Physical Security Equipment				1,293,000	1,293,000		
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
F/A-18A+ Joint Helmet-mounted Cueing System (JHMCS)						$1,737,529	$1,737,529
F-5 Terrain Avoidance Warning System (TAWS)/Traffic Collision Avoidance System (TCAS) Reconfiguration						1,200,000	1,200,000
Multifunctional Information Distribution System (MIDS)/ Joint Tactical Radio System (JTRS) Concurrent Multi-netting (CMN)-4 Terminals for F/A-18A+						3,100,000	3,100,000
F-5 Portable Environmental Protective Equipment						590,000	590,000
C-20G Dunlop Brake Upgrade						3,406,596	3,406,596
Medium Tactical Vehicle Replacement (MTVR) Upgrades to Support Radio Communication, Blue Force Tracker and Improvised Explosive Device (IED) Defeat Systems						26,347,177	22,047,177
Crew-served Weapon Simulators for High-value Unit (HVU) Escort Reserve Units						2,173,032	2,173,032
C-130T Quick Don Oxygen Mask						665,280	665,280
F-5 Radar Cockpit Display Unit Software Update						1,100,000	1,100,000
F-5 Tactical Combat Training System Pod Wi-Fi Modification						3,010,000	3,010,000
F-5 Simulator Upgrade/Technology Refresh						5,000,000	5,000,000
Fleet Logistics Support Squadron 51 (VR-51) Commercial Support Equipment						319,000	319,000
Space and Naval Warfare Systems Command (SPAWAR) Cybersecurity Training Kits						168,000	206,000
SPAWAR Cybersecurity Circuit Repair Equipment Suites						38,000	0
NAVSEA Combined Explosives Exploitation Cell Platoon Table of Allowance (TOA)						1,014,890	1,014,890
Naval Sea Systems Command (NAVSEA) Security Force Training Equipment						70,685	70,685
NAVSEA Dive Unit Automated External Defibrillator						12,927	12,927

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
NAVSEA Diving Equipment						46,884	46,884
Light Service Support Vehicle (LSSV)						0	3,540,000
Expeditionary Surveillance Control Center (ESCC) Trailer Sensor Platforms (TSP)						0	660,000
60kW Advanced Medium Mobile Power Systems (AMMPS)						0	100,000
Total				**$266,324,000**	**$257,374,000**	**$50,000,000**	**$50,000,000**

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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 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 2020 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 but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	P-8A	12	12	$176,000,000	$2,112,000,000	Procure 12 P-8As to recapitalize RESFORON P-3Cs with Fleet representative aircraft. Without recapitalization, the two Maritime Patrol Force RESFORONs will disestablish at the end of FY 2022 and the AC will lose both strategic depth and the ability to capture trained talent exiting active service.
2	FA-18E	31	31	$93,200,000	$2,889,200,000	Procure 31 F/A-18E aircraft to bring the RC in line with the AC, and allow RESFORONs to continue to deploy as Strategic Reserve squadrons. RESFORON FA-18C squadrons will not be able to deploy on CVNs beyond summer of 2019 as the infrastructure to support these aircraft will no longer reside on carriers.
3	KC-130J	24	24	$87,700,000	$2,104,800,000	Procure KC-130J aircraft to replace the aging and maintenance-intensive C/KC-130T aircraft. The C/KC-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 provide global logistics support while specializing in airlift for outsized cargo.
4	Force Protection Large / PB40 Patrol Craft	96	73	$2,800,000	$204,400,000	Current Force Protection Large (FP-L - 34FT PBs) patrol boats 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 replacment starting in 2019, with follow-on out-year procurement/acquisition startegy delivering complete replacement by 2025. The addition of the RC HVU mission requirement increases the requirement for patrol boats. Currently 34PBs are being sourced from the RC 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.

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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	Patrol Boat Simulator	3	3	$4,500,000	$13,500,000	Current motion platform simulator is for weapons training only and does not have the capability to simulate up to a four boat formation conducting operational training in conditions similar to required deployment areas. Additionally, it does not have the ability to provide basic navigation, maneuvering, or multi-boat simulation. Coastal Riverine Force RC units have no ability to exercise and learn basic skills aside from underway training, subject to craft availability due to condition/maintenance down time, or weather. This simulator provides a efficient, controllable, and repeatable medium for learning basic to advanced individual and team skills for the MK VI & PB 40 Patrol Boats as well as other boat platforms that will make underway training more effective, particularly with high utilization of assets for operational tasking. Systems to be co-located with CRS-11, 8, and 10 in Seal Beach, CA; Newport, RI; and Jacksonville, FL respectively.
6	EA-18G	7	2	$85,300,000	$170,600,000	Carrier based VAQ squadrons are currently deploying with 7 x EA-18Gs; expeditionary VAQ squadrons are scheduled to deploy with 6 x EA-18Gs by OCT 2020. MAP 18-2 is expected to increase VAQ-209's Growler inventory from five to six aircraft in FY2020/2021. There is no plan to add a seventh Growler despite VAQ-209's role as both a carrier and expeditionary-deployable squadron.
7	Adversary Aircraft	39	8	$3,800,000	$30,400,000	The Navy Reserve lacks adequate adversary capacity and capability to support the AC requirements. When the RC is unable to support AC adversary requirements, the AC is forced to expend costly F/A-18E/F flight hours. This cost to service life compounds the limited strike fighter inventory concerns. Adding adversary capacity to the Navy Reserve minimizes the excess flight hours the AC must fly on these warfighting platforms.
8	Extended Range Fuel System (MH-60S)	10	10	$190,246	$1,902,460	HSC-85's operational tasking when deployed requires an extra 2.5 hours of mission fuel that was within the capabilities of the HH-60H. These fuel tanks provide the MH-60S compatible capability.
9	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, which has a 33/67 AC/RC mix.
10	KC-130T Avionics Obsolescence Upgrade (AOU) Kits	5	5	$6,500,000	$32,500,000	19 of the 24 Navy Reserve C-130Ts have funding to complete their Avionics Obsolescence Upgrades. Funding is required to complete the upgrade of the remainder of the fleet. Without funding, avionics-related issues will continue to impact the KC-130Ts and affect mission capable rates.

Chapter 5
United States Air Reserve Components

I. United States Air Force Overview

AIR FORCE MISSION

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

AIR FORCE VISION

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

A. Air Force Planning Guidance

The National Defense Strategy acknowledges an increasingly complex global security environment. The re-emergence of strategic competition demands a more lethal and agile Joint Force to maintain a competitive edge against threats to national security. The surest way to prevent war is to be prepared to win one.[1] With global trends and intensifying pressure from major challengers, the U.S. military's advantage in air and space is eroding in a number of critical areas.[2] Sustained and predictable investment to restore readiness and modernize the Air Force are essential to maintaining and gaining this military advantage into the future.

The Air Force is building on the recent progress made to restore readiness, cost-effectively modernize, drive innovation, develop exceptional leaders, and strengthen our alliances. Based on the National Security Strategy, National Defense Strategy, and Nuclear Posture Review, the Air Force is developing the force we need to deliver the combat capability required to meet the demands of the global security environment.

As such, the Air Force must grow, both in capacity and capability. The Air Force five-year plan calls for achievable, steady growth to approximately 339,000 active duty Airmen. Simultaneously, the Air Force is reviewing existing manning across the active duty, guard, and reserve components. Additionally, the Air Force will invest in purposeful development of Airmen to strengthen its joint warfighting excellence—integrating education, training, and experience for its leaders and teams.[3]

The Air Force the nation needs will come from investment in the modernization of existing capabilities, like nuclear deterrence and air superiority, and the expansion of capabilities in the critical domains of space and cyber to enable freedom of operation, networked battle management, and integrated systems for the future fight.

To deliver that force, the Air Force has self-assessed through staff and zero-based budgetary reviews, realigned to better integrate strategy with resources, streamlined processes to eliminate

[1] 2018 National Defense Strategy Summary.
[2] USAF Posture Statement, Fiscal Year 2019, 24 April 2018.
[3] Ibid.

barriers and facilitate faster acquisition of capabilities, and revitalized squadrons as its core warfighting unit.

B. Air Force Equipping Policy

A critical premise of the force the Air force needs is Active Component (AC) and Reserve Component (RC) parity. To maintain parity, the Air Force 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 AC and RC units simultaneously in the proportional share of each component. The Air Force codified implementation in Air Force Policy Directive (AFPD) 10-3, *Operational Utilization of the Air Reserve Component Forces*, and Air Force Instruction (AFI) 10-301, *Managing Operational Utilization Requirements of the Air Reserve Component Forces.*

Additionally, the Air Force published Air Force Policy Memorandum (AFPM) 90-10, *Total Force Integration (TFI),* on October 2016, and AFI 90-1001, *Planning Total Force Associations (TFAs),* in January 2017 to provide policy for planning Total Force Integration initiatives across all components of the Air Force, including organizational roles and responsibilities. These integration frameworks include incorporating, to the maximum extent possible, the principles of concurrent fielding and retirement of equipment and technology among the components.

C. Plan to Fill Equipment Shortages in the Reserve Component (RC)

The Air Force will leverage the optimal mix of operational forces across the Total Force to shift quickly and efficiently from one mission to another. The Air Force continually seeks to maximize the value of the Reserve Component, most notably through unit associations. 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.

In January 2013, the Secretary of the Air Force directed the establishment of a standard, repeatable process to address Total Force options. Today, the process continues to assess the balance of the strengths of each component and develop strategic options for appropriate Total Force capabilities mix to meet current and future Air Force requirements. Led by the Headquarters Air Force Director of Staff (HAF/DS), the Total Force Integration office (HAF/DSI) has raised visibility and priority on continuing assessment of health and strength of integration in the total force, including identifying areas requiring legislative changes and policy relief to meet Reserve Component modernization needs. HAF/DSA is currently baselining all Association plans as part of a larger effort to capture key component issues.

D. Initiatives Affecting Reserve Component (RC) Equipment

A more lethal force begins with rebuilding and maintaining readiness. The Air Force constructed its fiscal year (FY) 2019 and 2020 budgets based on a strategy that builds a larger force, including end strength growth in all air components. The Air Force has initiatives under way to consolidate recruiting under the Total Force umbrella to better capture and retain talent across the service. The Air Force is closely monitoring its force structure and integration efforts to identify possible savings and redundancies, and assess areas for additional readiness improvements.

FY 2019 National Defense Authorization Act (NDAA) funds more flying hours, munitions, equipment, parts, depots, training, and training infrastructure. Moreover, the Air Force will buy 48 F-35A fighter aircraft on the way to 258 F-35As over the next five years. The F-35A brings unparalleled global precision attack capability. The Air Force will integrate it with legacy aircraft as well as space and unmanned aircraft, to strengthen air superiority in highly contested environments. Additionally, tanker recapitalization remains a top acquisition priority. The multi-role KC-46 is capable of refueling joint and coalition aircraft with both boom and drogue in the same sortie, and augments the airlift fleet with improved cargo, passenger, and aeromedical evacuation capabilities. The FY 2019 NDAA funds 15 more KC-46 tankers and continues funding to develop the B-21 bomber- a key component to the joint portfolio of conventional and nuclear deep-strike capabilities. The B-21 will be able to deliver both gravity bombs and the Long Range Stand Off missile, ensuring options for our nation's leaders to hold targets at risk around the world.[4] Total Force considerations and integration remains foundational to the fielding of all these assets.

E. Plan to Achieve Full Compatibility between Active Component (AC) and Reserve Component (RC)

The Reserve Components are critical partners in the force we need. With force structure changes in the field and at the headquarters, total force integration is baked in to planning and programming.

Total Force capacity and capability are critical to a ready and lethal Air Force. As such, the Air Force continues to develop integration between components and leverage the strengths and capacity to achieve a well-balanced, seamlessly integrated Air Force to meet the warfighting needs of the nation. Finding the optimal balance of roles and missions among each of the components enables the Air Force to be lethal, ready, agile, and capable of meeting the needs of combatant commanders in a demanding and increasingly challenging strategic environment.

[4] USAF Posture Statement, Fiscal Year 2019, 24 April 2018.

II. Air National Guard (ANG) Overview

A. Current Status of the Air National Guard

1. General Overview

Top ANG Equipping Challenges

- Budget instability—root cause of readiness erosion. Stable, predictable funding is paramount to rebuild readiness & lethality.
- C-17: Sustainment, maintenance, and supply support to extend service life.
- E-8C: JSTARS: Corrosion and changes to depot maintenance plan.
- F-16: Service life extension to keep fleet flying until 2046.

The Air National Guard (ANG) is America's "Hometown Air Force." The Air Force and the nation have always relied on the ANG to be operationally engaged and well equipped to contribute significantly to the national security of the United States. We have been and always will remain an essential and invaluable partner in the DoD's operational joint force. Our Airmen serve the needs of our citizens during federal missions across the globe in unexpected contingency operations and during state responses in the 50 states, 4 territories, and District of Columbia in defense support of civil authorities (DSCA) operations.

The Director, Air National Guard, Lieutenant General L. Scott Rice established three lines of effort to ensure the ANG can meet its constitutional obligation to the Nation. Our focus must start with "Readiness for Today's Fight" by ensuring the ANG is properly manned, trained, and equipped to accomplish all of our mission requirements. We must continue to evolve as "21st Century Guard Airmen" by adopting new mission sets, seeking out new capability, and demonstrating vigilant watch for any threat to our nation's security. As we participate in today's fight and look toward the future, we must never forget that to "Build for Tomorrow's Fight" we have to recapitalize the investments we have already made and continue to modernize concurrently with our Active Component (AC) partners.[1]

2. Current Status of Equipment

ANG support equipment and vehicle inventory fill-rate is 94 percent and 90 percent respectively.

a. Equipment On-hand (EOH)

Table 1 Consolidated Major Item Inventory and Requirements provides projected Reserve Component (RC) 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 now 31.9 years old with the oldest platform being the KC-135T fleet at an average age of 59 years old. Essential support equipment required for sustaining legacy ANG aircraft is no longer manufactured or is steadily becoming obsolete. As an example, the C-17 could experience a shortage of parts because vendors are no longer willing

[1] Air National Guard Strategic Master Plan 2019-2039, p. 1.

to produce parts.[2] This significantly increases maintenance cost and challenges efforts to improve readiness and increase aircraft availability.

See *Table 2 Average Age of Equipment* for the average age of major equipment items as of the start of FY 2019.

c. Compatibility of Current Equipment with Active Component (AC)

General Joseph Lengyel testified before the Senate Committee on Appropriations-Defense that the Guard needs to be ready, rapidly scalable, and accessible with little or no notice for any contingency.[3] He asserted that the Guard is interchangeable with the AC when mobilized and deployed. To that end, readiness is a priority and it includes modernization and recapitalization of equipment. ANG requires equipment modernization to be compatible with AC missions. This is critical for ensuring Air Guardsmen properly train to a single standard required to seamlessly integrate the ANG with the Total Force. With continued congressional funding, the ANG will be able to maintain compatibility with the AC in any mission area.

d. Maintenance Issues

The Department of the Air Force is operating many of their fixed-wing aircraft well beyond their original designed service lives.[4] Because the ANG operates and maintains the oldest aircraft in the Air Force inventory, we face significant challenges to increasing aircraft availability. Currently, the ANG overall fixed-wing aircraft availability rate is 55.7 percent. In a Government Accountability Office (GAO) Study, GAO-18-678, Weapon System Sustainment, analysis indicates that for FY 2016, total operating and support (O&S) costs for the five Air Force fixed-wing aircraft selected for review (B-52, C-17, E-8C, F-16, and F-22) totaled about $12 billion. The average O&S cost per aircraft across the fleets studied was about $96 million. Each of the C-17 and F-16 fleets accounted for about 33 percent of the total O&S cost, and the E-8C's average cost per aircraft account for about 48 percent of the total average cost per aircraft.[5] Much of the Air Force's capability in these weapon systems resides in the ANG.

ANG aircraft support and test equipment is critical to daily maintenance operation at all ANG flying units. ANG 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, robust supply chains, and devices that enhance maintenance efficiency and safety, improve capabilities and aircraft availability, reduce operating, costs, and enhance agile combat support. Equipment such as the maintenance inspection platforms and digital test equipment reduce aircraft downtime, allow logistics personnel to maintain a high rate of sortie generation, and ensure the longevity, relevance, reliability, and responsiveness of the aging fleet. ANG Weapon Systems

[2] GAO-18-146 Weapon System Sustainment, p. 38.
[3] Written Statement by General Joseph L. Lengyl to the Senate Committee on Appropriations-Defense, 17 April 2018.
[4] GAO-18-678 Weapon System Sustainmen, p. 2.
[5] GAO-18-678 Weapon System Sustainment, p. 65.

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 sustainment costs. This is an inefficient use of funds and manpower and hampers mission reliability. Updating to digital replacements for certain test equipment items such as the Active Bus Tester will enable maintenance personnel to troubleshoot and repair aircraft in a fraction of the time required by older methods. Sustaining modern weapons systems has become increasingly difficult and expensive as ANG utilizes aging test sets based on 1970s and 1980s technology. Munitions and weapons test sets require stable power to reduce the risk of electrical damage to the test set or the connected asset.

Modernizing the power carts will provide units with clean, consistent power, prevent costly damage to Air Force assets, and maximize aircraft availability. While some support equipment modernization was completed last year, the majority of aircraft support equipment was designed and built in the 1970s and 1980s and is not compatible 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, which consolidate multiple functions, are more efficient to operate, and enhance maintenance efficiency and safety.

Isochronal (ISO) Maintenance and Inspection Stands: ANG lacks the necessary C-17 maintenance inspection stands to perform required inspections and maintenance. The first C-17 ISO Maintenance Stand set was delivered in May 2018, with four additional stands to be delivered in the future. ANG's KC-135 inspections stands no longer meet Air Force Occupational Safety and Health or Occupational Safety and Health Administration (OSHA) standards as these aging stands average 30 years old. The first five of 10 KC-135 ISO Maintenance Stands have been delivered to ANG units resulting in an average of five days savings during ISO Maintenance Inspections. The new ISO stands have also allowed for more efficient follow up checks from Quality Assurance and provided a platform to allow training to be accomplished in a safe and efficient manner. Consequently, the ANG needs to purchase four new C-17 stands and five new KC-135 inspection stands totaling $17M to alleviate unnecessary risk, allow maintainers to focus on aircraft specific tasks, and provide a safe working environment.

e. Modernization Programs and Shortfalls

The annual Air Reserve Component Weapons and Tactics and ANG Domestic Capability Priorities Conferences remain the primary clearinghouses for ANG modernization efforts. At the Weapons and Tactics Conference, field operations, maintenance, and support experts ANG-wide identify and vet critical shortfalls collaboratively with headquarters staff-level functional area managers. The process includes 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 2019 Modernization Book documented a $12.3 billion shortfall for modernization and recapitalization of the ANG aircraft fleet and associated equipment.

The Domestic Capability Priorities 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 (FEMA's) Emergency Support Function framework and aligns requirements with the Chief, National Guard Bureau's core capabilities. The output from this conference is published in the annual ANG Domestic Capability Priorities (DCP) Book. The 2019 DCP book identified $480 million in capability priorities.

The ANG Modernization Book and the Domestic Capability Priorities Book, available at http://www.ang.af.mil/Home/ANG-Priorities-Books/ANG, illustrates how ANG leverages NGREA to modernize 22 weapons systems and mission areas and procure equipment for ANG domestic operations (covering 11 of 15 Emergency Support Functions). Priorities for modernization include aircraft sensors, legacy cockpit upgrades (communications/datalink), aircraft defensive system upgrades, simulators, and Battlefield Airmen (BA) equipment. Priorities for equipment supporting domestic operations include: equipment for first responders, C2 equipment, emergency mobile medical facilities, Chemical, Biological, Radiological, Nuclear, and High-yield Explosives (CBRNE) response equipment, and urban search and rescue equipment. These modernization and equipping efforts are detailed below.

i. Agile Combat Support:

Engineering: Shortages in firefighting, Urban Search and Rescue (US&R), Explosive Ordnance Disposal (EOD) equipment, water production kits, and Chemical, Biological, Radiological, Nuclear (CBRN) detection and support equipment continue to inhibit the ANG's ability to perform home station and overseas deployments, or provide support to civil authorities. The ANG is exploring a joint fielding of potable water production with the ARNG for pre- and post-disaster civil assistance. The initial estimate is $5M to field one complete kit in each of the 10 Federal Emergency Management Agency (FEMA) Regions with one additional kit each for Alaska, Hawaii, and Puerto Rico. There is a continued need for explosive detection devices and personal protective equipment for EOD. To mitigate this shortfall, the ANG has procured modernized bomb suits, quick scan digital x-ray scanners, modernized remote firing devices, and standardized tool kits, providing increased safety and survivability to ANG EOD personnel and local communities. Furthermore, the ANG has fielded next generation state-of-the-art CBRN detection equipment to 90 Civil Engineer Readiness and Emergency Management Flights. This detection equipment fills a critical gap for detecting chemical warfare agents in gaseous and vapor forms.

ANG CBRN personnel have also identified the need for CBRN robots. CBRN robots will enable hazardous material response personnel to gather real-time readings in a hazardous material release area, reducing the risk of exposure to personnel. To enhance C2 operations during support to civil authorities and national security events, Emergency Management personnel have identified the requirement to modernize the 25 Mobile Emergency Operations Centers to make them air transportable and more agile for response. In FY 2018, funds were used to purchase search and rescue, EOD, civil engineering, chaplain, emergency management, and hazardous materials handling equipment.

Expeditionary Air Traffic Control: The 1950s analog-based AN/MPN-14K is still the primary ANG deployable Air Traffic Control system. It has received only minor radar upgrades since the

1980s. Sustainment of this legacy system is increasingly difficult because many of the subsystems are no longer commercially available or produced. ANG will replace these legacy systems with a total of 10 AN/MPN-14K systems and 20 Deployable Instrument Landing Systems. The Deployable Radar Approach Control allows the safe sequencing and separation of aircraft and can be directly interfaced with the National Airspace System. It offers primary and secondary radar capabilities as well as a complete air-to-ground communications suite designed to conduct air traffic control operations in austere environments. The Deployable Instrument Landing System will replace Precision Approach Radar on the existing MPN-14K. The system will provide precision approach guidance to equipped aircraft with a decision height of 200 feet and ½-mile visibility. ANG is scheduled to reach initial operational capability (IOC) in FY 2019 and full operational capability (FOC) in FY 2026 with these systems (Deployable Instrument Landing System IOC in FY 2019 and FOC in FY 2022 and the Deployable Radar Approach Control IOC in FY 2019 and FOC in FY 2026).

Medical: ANG has used NGREA funding to modernize its Expeditionary Medical Support (EMEDS) assemblages and the 27 CBRNE Enhanced Response Force Package (CERFP)/Homeland Response Force teams. Upgrading ANG EMEDS with new equipment ensures alignment of resources with the AC and enables the medical units to continue providing modern lifesaving, patient care, and treatment tools for medical first responders and the patients in their care. Airway Management Modernization equipment for the 27 CERFP units is scheduled for delivery in mid-2019.

Operational Training Infrastructure (OTI), Simulation and Range Instrumentation: OTI is the overarching training technology that encompasses and links all aspects of simulation, including Distributed Mission Operations and range instrumentation, into a live, virtual, constructive (LVC) battlespace environment. The ability to connect simulators for mission rehearsal events and exercises adds a significant and required level of realism to simulator training.

The ANG procures simulators through Air Force programs and designs and builds simulators in-house to meet training requirements. The ANG simulator programs recently fielded 2 ANG Advanced Joint Terminal Attack Controller Simulation Systems, 95 Security Forces use of force simulators, 7 C-130H Multi-Mission Crew Trainers, 1 HH-60G Multi-Mission Crew Trainer, 4 F-16 Mission Tactics Trainers - Guard, and 14 Remotely Piloted Aircraft (RPA) MALET Joint Aircrew Trainers, as well as upgrades for the F-15C and F-16 unit simulators. Current OTI upgrades at the ANG's 12 air-to-ground ranges include high and medium fidelity surrogate target systems and advanced laser scoring systems. In addition, the ANG initiated procurement of a high-fidelity, next generation C/EC/HC-130J Level D Reconfigurable Weapons System Trainer for delivery in FY 2019. The Reconfigurable Weapons System Trainer will increase simulator training effectiveness for C-130J aircrews from all C-130J variants by allowing them to train in one simulator, significantly reducing costs. A proof of concept Combat Operations Procedures Simulator is under construction for evaluation by ANG Contingency Response Group subject matter experts. A recently initiated project will design and deliver an MC-12W Mission Systems Trainer for the 137th Special Operations Wing Initial Qualification Course. Finally, the ANG developed a Relocatable Simulator Shelter (RSS) project to provide a cost-effective, solution for the lack of on-base facilities to house new ANG simulators.

Security Forces (SF): ANG security forces include over 7,500 defenders from all wings in each of the 54 states and territories. Security Forces face 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 operational readiness for all ANG personnel preparing for deployment. The ANG is actively filling SF equipment shortfalls utilizing NGREA funds. Within the last year, the ANG has begun to field portable Use of Force Simulators, five additional modular ranges to increase deployment readiness, and Interoperable Radios. It has modernized a portion of the SF vehicle fleet to equip Security Forces Defenders to meet their Title 10 and domestic response missions. SF personnel have also identified additional equipment requirements that include, non-lethal weapon modernization, utility task vehicles, and duty gear modernization that will enable SF Squadrons to provide mission ready Airmen.

Space Operations: The ANG contribution to Air Force Space Command missions includes over 900 personnel within eight squadrons and provides 40 percent of Total Force satellite C2. ANG is working in partnership with Air Force Space Command (AFSPC) in order to aggressively modernize key components. The 233 Space Group/137 Space Warning Squadron replaces its legacy Mission Ground System equipment with the Space Based Infrared System (SBIRS) Survivable/Endurable Evolution (S2E2). This critical equipment upgrade is crucial for operational viability. The 114th Space Control Squadron (SPCS) and 216th SPCS completed conversion in 2017 and are supporting AFSPC deployments. In 2018 the ANG added a third SPCS in the Colorado Air National Guard, followed by a fourth SPCS that is currently in the SAF/IE basing process. Additionally, ANG plans to modernize 20 Space semi-tractors needed by the 233 Space Group with their survivable missile warning and nuclear detonation detection mission. The semi-tractors are needed to mobilize SBIRS Mobile Ground Terminals (SMGT) and universal Ground Nuclear Detection Terminals. The three SPCSs need modernized electronic warfare operational and training equipment. In the future, close coordination between AFSPC and ANG will be crucial to ensure the viability and readiness of ANG Space Operations units.

Special Warfare (SW): Special Warfare is a new nomenclature, replacing Battlefield Airmen. Special Warfare refers to the following four mission design series: Combat Controller Teams (CCT), Guardian Angels (GA), Special Operations Weather Teams, and Tactical Air Control Parties (TACP). ANG continues to pursue solutions to close critical modernization gaps in SW. The top priority is the SW interoperable communications program, which provides SW with both enhanced situational awareness and communication capabilities. The ANG is forecasting to supplement the Air Combat Command battlefield equipment with NGREA funds for 14 TACP, 2 CCT, and 3 GA squadrons. ANG BA requires continuous modernization with coded spot trackers, short-wave infrared devices, mission recording equipment, and tactical vehicles to remain viable and relevant as a Total Force partner. Optimal employment capability requires BA forces to have wireless solutions, improved night vision devices, advanced tactical headsets, and less-than-lethal weapons. The mission of Guardian Angels is not solely special operations; they contribute to daily rescue missions from home station, and require dual-use equipment. In FY 2018, funds were used to procure enhanced body armor, infrared pointers, and communications equipment for TACP units. Congressionally added funds were used to procure required equipment for the new ST units authorized.

ii. Combat Aircraft:

A-10: ANG provides 40 percent of the Air Force's A-10 fleet. Testing and fielding recommendations for Advanced Targeting Pod (ATP) digital output upgrades, with high-resolution feeds and color video enabling visual identification of friendly and enemy forces from greatly increased standoff ranges, should complete in FY 2019. The planned installation of high resolution displays and a second Gigabit Ethernet Switch in the A-10 in early FY 2021 will enable full utilization of these targeting pod improvements. NGREA funding will also support the integration of noise-cancelling and 3D Audio which increases situational awareness by spatially separating aural warning and radio signals and providing angular cueing to ground and air threats when used in conjunction with a Helmet Mounted Cueing System. Fielding for 3D Audio is programed for FY 2020. The installation of a Selective Availability Anti-Spoofing Module, Embedded Global Positioning System (GPS)/Inertial Navigation System (INS), will improve navigational accuracy in a GPS-denied environment. Air Combat Command approved these modernization efforts, which will conclude in FY 2022. ANG A-10s require an enhanced ability to operate from austere airfields with fewer maintenance and logistics personnel. In 2014, the ANG began upgrading the A-10 with a parking brake to allow refueling without requiring ground personnel to place and remove chocks; however, due to system anomalies, this program has been indefinitely suspended. Smart triple ejector rack (TER) modifications will permit carriage of additional GPS-guided munitions. Maintenance personnel at each of the ANG's four A-10 units require specialized equipment to support aircraft at austere locations, including night vision goggles (NVG), NVG storage cases, infrared headlamps, integrated helmet and headsets with noise cancelling boom microphones and wireless intercom system, and secure-capable tactical radios. The conversion fuel tank program, which modifies excess F-15 external fuel tanks for use on the A-10, will improve the A-10's range and loiter time, and minimize the need for additional refueling operations at austere airfields. Expected fielding is in FY 2020.

F-15C: ANG operates 58 percent of the F-15C/D fleet and CONUS units provide 31 percent of the nation's Aerospace Control Alert (ACA) assets, spanning five alert sites and providing 24-hour homeland defense. Upgrading obsolete Mechanically-Scanned Array radars to modernized Active Electronically Scanned Array (AESA) radars on ANG F-15Cs provides combatant commanders essential updated air superiority and homeland defense capability, and remains the first priority for modernizing all ANG F-15C/D aircraft. 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. NGREA funds are being used to procure and install the hardware required to carry the critically important back-of launcher high-capacity external countermeasures system.

ANG F-15s require out-of-band multi-spectral search and track systems, such as Infrared Search and Track, enabling the F-15C to detect and track targets in highly-contested and degraded environments. Future capability to increase persistence and reduce workload on an already strained tanker fleet includes the addition of Conformal Fuel Tanks (CFTs). This ANG effort will integrate CFTs, demonstrate their operational utility, and directly support the U.S. Northern Command and U.S. Pacific Command mission of providing homeland defense by increasing fighter aircraft range and on-station time. With current and required future mission system upgrades, the legacy displays and communication architecture are inadequate. Replacement of legacy displays in all (123) F-15C aircraft with smart color display systems increases ANG

F-15C capability by displaying offensive and defensive data more intuitively to the pilot. An updated helmet mounted cueing system will facilitate day to night transition missions and provide integrated night vision capability that decreases pilot fatigue by lowering the system weight and incorporating 3D audio. In response to a US Northern Command urgent operational need for beyond line of sight communication capability for alert aircraft, the ANG has worked with the system program office to field, with NGREA funding, an initial, standalone satellite communications capability that is now in need of proper integration. In FY 2018, ANG purchased digital eyepieces for its F-15Cs to provide air and targeting data to pilots using night vision goggles.

F-16: The highest priority upgrade for the F-16 fleet continues to be sustainment and replacement of the current radar system. The aging, mechanically-scanned array radar continues to require significant sustainment and is ineffective in all but the most permissive of operational environments. While ANG continues to look at a means of replacing the most failure-prone components of the radar system with upgraded, digital components, the Air Force is working with OSD to field AESA radars on F-16s tasked with the ACA mission using congressionally added funds. The requirement to field AESA on ACA-tasked F-16s stems from an OSD-validated joint urgent operational need from USNORTHCOM. To keep ANG F-16s viable in future operations, and to avoid a split fleet of AESA and mechanically scanned radars which is logistically taxing, all of the remaining F-16 fleet needs to be upgraded with AESAs.

ANG is executing NGREA to fund the installation of secure line-of-sight (SLOS) and beyond line-of-sight (BLOS) communications suites; higher data rate processors for vital systems upgrades; high-resolution center display units; helmet-mounted integrated targeting system; enhanced self-protection suites to include 3D audio; and the advanced identification, friend or foe combined interrogator transponder, a system acknowledged by USNORTHCOM as a critical requirement for homeland defense. The ANG is pursuing ALR-69A as a modernization effort using congressionally appropriated funding, but initially only on aircraft equipped with the AESA radar system. To counter the proliferation of infrared-guided, man-portable, shoulder-launched surface-to-air missiles, the ANG is investigating procurement of an off-the-shelf pylon-mounted missile warning system for the ANG F-16 fleet. The ANG procured a second ARC-210 radio for pre-block F-16s to enable simultaneous SLOS and BLOS operations. Future capabilities include a three-dimensional audio system to reduce pilot workload by synchronizing and spatially separating multiple radios. Link-16 Multifunctional Information Distribution System Joint Tactical Radio System (MIDS-JTRS) is also being funded by the ANG through NGREA as an advanced data link. The ANG is funding an integration effort to allow the use of the AN/ASQ-236 Synthetic Aperture Radar pod. This effort will allow the self-generation of high quality targeting coordinates in all weather conditions, day and night. In FY 2018, ANG purchased digital eyepieces for its later block F-16Cs to provide air and targeting data to pilots using night vision goggles. ANG also started the process to upgrade its later block F-16s with improved center display units, to match the capability already purchased and installed in its earlier block F-16s.

iii. Intelligence, Surveillance, and Reconnaissance (ISR)

Air Operations Centers (AOCs): 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. The seven ANG AOC weapon system baseline sites previously upgraded brought the sites closer to combatant command AOC standards in terms of applications and information assurance. ANG-funded Joint Range Extensions have provided significant advantages to the Air Operations Group (AOG) distributed mission operations capability. A scaled core radio package for each of the ANG AOG sites will improve communication and maximize use of this tool. The core radio package consists of multiple radios, antennas, and data-link functionality essential to operating Joint Range Extensions, ensuring continuity with AOG training. Upgrade of the AOCs weapon system represents a considerable change to the previous capability, consisting of major platform enhancements and core equipment upgrades. Failure to modernize all ANG sites will adversely affect the AOG's ability to affectively train and maintain mission-capable personnel due to incompatibility of C2 mission applications and deficiencies in data interoperability between AOGs and assigned AOC locations. Proposed upgrades to the weapons system and core radio packages are critical components for improving the AOG's ability to support their assigned geographic AOCs and enhance process integration within the AOC mission. NGREA funds are being applied towards procuring Cross Domain Solutions "SecureView" and Information Support Server Environment (ISSE).

Battle Control Center (BCC): BCCs support North American Aerospace Defense and NORTHCOM as part of the homeland defense mission, Defense Support of Civil Authorities, and search and rescue. ANG BCCs are in four locations; Alaska, Hawaii, Washington State, and New York. Due to aging infrastructure, the BCCs require continual modernization of C2 systems including beyond line-of-sight satellite communications, integration of advanced sensors, and the ability to fuse multiple advanced data feeds into existing radar architectures. Modernization of the BCC sensors to detect low flying, slow aircraft is critical for the BCC's ability to work collaboratively with Aerospace Control Alert fighter aircraft and ground-based air defense units. Data fusion at the BCC enhances battlespace situational awareness and enables dissemination of a common operating picture at the operational and tactical levels. The constantly evolving advanced data link capabilities need to be incorporated into the BCCs and are required 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. A Cross Domain Enterprise Service would allow BCCs to integrate tactical data links, provide functional redundancy to the Air Event Information Sharing Service, integrate joint service tactical data links, and facilitate Defense Support of Civil Authorities through the Situational Awareness Geospatial Enterprise application. The ANG BCCs require a Live Virtual Constructive (LVC)/Distributed Mission Operations (DMO) capable simulator training system that produces a virtual environment enabling 4th and 5th generation fighter integration, and allows control of the direction, de-confliction, and employment of ground, surface, and air assets. Current NGREA funding is providing simulators to facilitate Air Battle Manager crew training separate from the real world operations floor and upgrading data link terminals and SATCOM radios for the Alaska and Hawaii BCCs. Due to funding constraints, the BCC modernization is expected to last 5–7 years.

Control and Reporting Center (CRC)/Air Control Squadron: The ten ANG CRCs, at the operational and tactical level, provide surveillance, tactical communications, data links, and combat-related air battle management of joint air operations with real-time networked situational awareness. The control and reporting center capabilities are adapting to meet future command and control requirements while sustaining relevant systems through several efforts within this

mission design series. Significant realignment of mission capabilities is projected to streamline battle management internal to command and control mission assets. The modernization of the Integrated Digital Mission Recording and Playback system for the operations modules represents a major forensics reconstruction capability allowing mission playback to mitigate current degradation in debriefing, safety, and training. 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 AN/TYQ-23A Service Life Extension Program (SLEP) and modernization program addresses critical mission shortfalls and urgent requirements identified in recent evaluations. Fielding of the AN/TYQ-23A was completed in 2018.

Continued mission requirement transformation outpaces planned upgrades to mission capabilities and SLEP. Diminishing manufacturing sources of the AN/TPS-75 Radar has led to a shortfall in parts. The estimated fielding timeline for the 3DELRR to ANG units has been extended to FY 2030. ANG CRCs require the capability to interrogate Mode 5 and access Automatic Dependent Surveillance-Broadcast (ADS-B) data to complete an identification matrix organically. ANG CRCs also require a 1,300 square foot, hard-sided, climate-controlled, relocatable shelter to house the tactical operations center, along with 18 operator consoles for in-garrison training. The fabric tents currently utilized are not intended for long-term use and do not provide a climate-controlled environment for personnel and equipment. CRCs do not have the capability to train against an EA-equipped threat and this lack of training results in crews being unprepared to mitigate real world radar degradation due to the effects of EA. They require the capability to simulate Electronic Attack (EA) against the CRC radar during real-world training.

Cyber Warfare (CW): ANG has 2,355 Airmen assigned to cyber, which includes 3 Cyber Ops Groups, 2 Operations Support Squadron, 18 Cyber Operations Squadrons, and 2 squadrons engaged in training missions. Twelve squadrons are equipped with components of the Cyber Vulnerability Assessment/Hunter weapon system. In FY 2018, Air Force Space Command (AFSPC) completed delivery of the AF Cyber Defense weapon system to one squadron, and the Cyberspace Command and Control Management System weapon system to another. In order to ensure access to adequate training capabilities within the squadrons for local training, exercises, and individual/crew certification, the ANG, through NGREA, invested in the Virtual Interconnected Training Environment for each Cyberspace Operations Squadron (COS) in FY 2017 and FY 2018. For FY 2019, ANG is utilizing NGREA to acquire a part task trainer for each COS to allow squadron training sections to certify individual cyber skills following initial qualification training. These NGREA funded training systems are designed to facilitate local training for ANG members pending PMO acquisition and deployment of weapon system simulators and maturation of the Persistent Cyber Training Environment.

Distributed Common Ground System (DCGS): The ANG has three fully functional multiple intelligence core sites in Indiana, Kansas and Massachusetts, three fully functional Geospatial Intelligence sites Distributed Ground Stations in Alabama, Arkansas and Nevada, along with two classic associate sites in California and Virginia. There are also three Distributed Mission Sites (DMS) in the ANG (DMS-Utah is a unit equipped site and there are two classic associates at DMS-Georgia and DMS-Hawaii). The ANG plans to utilize NGREA funds to modernize electronic-attack mitigation equipment at these sites. Open Architecture (OA) operational pilot program began in FY 2017 at Reno ANG Base, NV, and Terre Haute ANG Base, IN. This pilot program is being used to prove the OA capability and lay the ground work for testing and

accreditation at future locations. Otis Air National Guard Base continues to provide operational expertise in the development of OA with Air Force Research Lab. ANG continues to work with Air Combat Command and the Air Force Life Cycle Management Center to understand the operational and sustainment impacts with OA. ANG DCGS and targeting units require Publicly Available Information toolkit access which can be leveraged against Geospatial Intelligence, Signals Intelligence, and Human Intelligence to amplify existing data to facilitate proper intelligence action.

E-8C Joint Surveillance Target Attack Radar System (JSTARS): ANG E-8Cs 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. To address current operational requirements, the ANG continues to invest NGREA funds to accelerate modernization of the E-8C JSTARS platform. NGREA funding is delivering a Global Imagery Server to all 16 E-8C aircraft, which provides worldwide imagery data that is layered with multiple geospatial data sources to support JSTARS battle management and surveillance. NGREA was also used to fund the maritime integrated Automatic Identification System, which identifies and locates vessels by electronically exchanging data with other nearby ships and vessel tracking services stations, greatly enhancing JSTARS's ability to distinguish between neutral and suspect maritime entities. The Integrated Broadcast System, which provides data feeds from airborne and overhead electronics intelligence collectors and allows JSTARS to detect and track a host of mobile threats, including enemy air defense and theater ballistic missiles assets, is being modernized on all E-8C aircraft. NGREA funding is also providing an airborne Top Secret/Sensitive Compartmentalized Information connectivity by integrating Joint Worldwide Intelligence Communications System laptops onto the aircraft. NGREA was used to upgrade the E-8C Weapon System Trainer, which will improve pilot simulator training in, among other things, air-to-air refueling. To extend the E-8C's service life, the Air Force is procuring and installing kits for an upgrade of the primary mission equipment to resolve issues caused by diminished manufacturing sources.

ANG E-8C JSTARS aircraft require an Electronic Intelligence system capable of detecting emissions from Unmanned Aircraft Systems (UAS), to include both the aircraft and the remote controllers, to provide an organic capability to aid in the detection and identification of UAS-type targets and to cue other sensors for faster acquisition of target information. ANG E-8Cs also require the capability to act as a communications gateway, bridging the 5th to 4th generation fighter data link interoperability gaps.

MC-12: The MC-12 is owned by USSOCOM with Air Force Special Operations Command (AFSOC) operational control, and flown by the Oklahoma ANG. ANG NGREA will be put towards outfitting the ANG MC-12 aircraft with high definition IR sensor in the existing electro-optical (EO)/IR sensor ball and short field take-off and landing capability through the use of 5-bladed props. All ANG modernization procurements for the MC-12 will be easily installed and removed, or have a roll-on/roll-off capability for the nine aircraft the ANG operates in order to make those procurements available to other ANG aircraft.

MQ-9: The MQ-9 Remotely Piloted Aircraft (RPA) comprise the largest Major Weapons System community in the Air Force. The ANG has 12 RPA units and two of the three MQ-9 Formal Training Units with three additional sites that support local continuation training. ANG MQ-9

units provide 13 percent of the Air Force's total fleet but support 54 percent of theater combat air patrol missions. The MQ-9's HD Full Motion Video, Synthetic Aperture Radar (SAR), communications/data relay, and wide area imagery capabilities, with the ability to loiter a minimum of 10 hours anywhere in the continental United States (CONUS), makes it ideal for Information Assessment and Awareness, counter drug, event oversight, and border protection missions.

The ability for the MQ-9 to seamlessly integrate into the national airspace is the top priority for operations within CONUS. To overcome this barrier, the ANG is working diligently with the Federal Aviation Administration (FAA) and industry to develop and procure both airborne and ground based detect and avoid technology expected to meet initial operational capability by 2020. Ground Based Detect and Avoid (GBDAA) is a ground based radar system that allows RPA operators to detect and avoid other aircraft, thereby preventing flightpath conflicts. It allows the RPA to meet international and FAA safety requirements and prevent RPA flight limitations in international and domestic airspace. GBDAA has been funded for the first 3 of 12 GBDAA systems by congressional ads, plus NGREA. Another aspect of safe and effective operations within the national airspace is the ability to land at outlying airfields. The ANG is working to develop material and non-material solutions to establish a network of airports across CONUS that can support MQ-9 operations in the 2020 timeframe.

Enhancing the MQ-9s capability to relay communications and data is a critical priority. Due to the MQ-9s persistence, it can provide 24hr communications services to areas that otherwise would not have coverage. This capability benefits both DSCA and overseas operations. The ANG is leveraging NGREA to procure a podded system that will provide these capabilities by the end of FY 2019. The ANG MQ-9 community has the need for a shared common operating picture with full motion video/search and rescue imagery sharing capability among MQ-9 crews, analysts, squadron/state leadership and civil authorities on unclassified networks. In conjunction with the HAF/A2 the ANG has developed and fielded the GUARDIAN system which enables seamless situational awareness, communication, and product sharing across internet protocol based systems. GUARDIAN was pivotal in the late 2017 California Wildfires where it was used in conjunction with MQ-9 FMV to track fire lines, ensure safe firefighter movements, and inform evacuation decisions.

RC-26B: The RC-26B provides manned ISR and Incident Awareness and Assessment capability with 11 aircraft operating out of 10 different states for maximum CONUS coverage. It provides civil support/law enforcement radio capability, modern EO/IR sensor turret FMV, and BLOS data capability to disaster relief, counter drug, and border protection missions. The top priority for RC-26 is upgrading antiquated avionics to include GPS, electronic flight information system displays, a flight management system, and the navigation and communication radios needed to comply with FAA and International Civil Aviation Organization mandates. Additionally, NGREA is being utilized for the RC-26's BLOS capability's authority to operate to ensure safe operations from a cyber perspective. Future plans include aircraft upgrades to allow the carriage of additional roll-on equipment for increased capabilities and integration of external communication relay pods.

iv. Mobility Aircraft:

C-130H: Legacy C-130H aircraft safety and compliance requirements are being addressed via the Avionics Modernization Program, Increments 1 and 2. This includes Communication, Navigation, and Surveillance/Air Traffic Management as well as Automatic Dependent Surveillance-Broadcast (ADS-B) to ensure global airspace access. Increment 1 is fully funded and on contract for all ANG C-130Hs. Increment 2 is fully funded and contract award is expected in April 2019. The C-130H fleet is also exploring performance and fuel savings initiatives with a 3.5 engine upgrade proposal, 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. Additionally, the Single Pass Precision Airdrop (SPPAD) program has begun operational testing with the addition of a LITENING Pod to increase the accuracy and delivery of personnel and equipment. Improvements to the Real-Time Information in the Cockpit (RTIC) program are being integrated to increase data link capabilities. An upgraded radar warning receiver (ALR-69A), Advanced Integrated Electronic Combat System, and Large Aircraft IR Countermeasure (LAIRCM) systems will be implemented on the fleet, which enhances operations in hostile environments.

C-130J: The C-130J requires the real-time in-cockpit situational awareness system for 28 aircraft, including the EC and MC-130Js. Upgrades to the hardware/software provide an airborne dynamic re-tasking capability and an integrated processor that will improve operational effectiveness. The RTIC system will be the baseline for SPPAD implementation to increase the accuracy and delivery of personnel and equipment during airdrop operations. The SPPAD assessment from C-130H testing and fielding will be utilized for similar upgrades to the C-130J. Additionally, the ANG is integrating Block 20 LAIRCM on the C-130J with a future plan to upgrade the system. ANG C-130Js also require updated avionics to meet the deadline for the international Communications, Navigation and Surveillance/Air Traffic Management 2020 mandate to include updated avionics with Automatic Dependent Surveillance Broadcast (ADS-B).

EC-130J: The EC-130J “Commando Solo” conducts information operations, psychological operations, and civil affairs broadcasts. ANG provides 100 percent of the EC-130J assets in the U.S. Air Force. The ANG continues to work with AFSOC to identify and field capability requirements. Specialized Automated Mission Suite/Enhanced Situational Awareness (SAMS-ESA) is the AFSOC solution to meet the enhanced situational awareness requirement. The roll-on/roll-off Special Airborne Mission Installation and Response system will be used to hold broadcast antennas/pods, which, in conjunction with the Removable Airborne Military Information Support Operations System, are necessary to achieve U.S. Special Operations Command’s (USSOCOM’s) core competencies. Finally, AFSOC is procuring a Reconfigurable Weapons Systems Trainer for the ANG EC-130J with a planned delivery in early 2020.

LC-130: The LC 130 operates on snowfields in remote areas of the Polar Regions in support of the National Science Foundation (NSF). The current modernization projects for the LC-130 aircraft are expected to be complete in FY 2020. All of the LC-130s now have the Electronic Propeller Control System installed and one initial installation of the NP2000 eight bladed propeller. This program is fully funded for the LC-130, and the ANG plans to procure additional

propeller upgrades for all other C-130H variants. The LC-130 is the first aircraft to receive the T56 3.5 engine upgrade, with installations planned for completion in FY 2019. The LC-130 Crevasse Detection Radar, which enables the pilot to identify and avoid crevasses in deep ice-field locations, is operational, but updates to the radar continue to improve its usefulness. The ANG is also working closely with the NSF to streamline the process that enables the science community to use the LC-130 for research purposes. Use of innovative equipment that has minimal impact on the structure of the aircraft will speed the approval process and significantly reduce engineering efforts. Since the cost to replace these aircraft is unattainable under current fiscal constraints, the ANG plans to continue to operate this platform through 2040. 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.

C-17: ANG C-17 units provide 23 percent of the total Air Force C-17 fleet. Aircrews for the C-17 and other mobility air forces aircrews, have identified the need for better, more reliable, means of communication between aircrew and C2 entities. The real time in cockpit situational awareness system will include upgraded hardware/software to provide an airborne dynamic re-tasking capability and an integrated processor that will improve operational effectiveness. These improvements include an integrated data link, upgraded satellite communications, and an electronic flight bag. To increase operational effectiveness in a hostile environment, the C-17 community has identified LAIRCM as the most effective measure against man-portable air defense systems. To counter radar threats, the C-17 requires an upgraded digital radar warning receiver to defeat current and future radar threats. For deployment to austere operating locations, the C-17 has the ability to “tanker” in fuel for other airborne assets; however, they do not have the ability to offload the fuel. Forward air refueling point carts and equipment will enable the C-17 to stockpile fuel in forward areas for use by other coalition aircraft. Laser attacks are becoming more prevalent worldwide. A laser-resistant windscreen film has been developed to adhere to the windscreen in Mobility Air Forces aircraft and protect the aircrew against dangerous laser pointers. The laser-resistant windscreen will protect aircrews from laser threats and also eliminate the need for personal laser eye protection. ANG C-17s require an EO/Infrared sensor to accurately identify and track both friendly and enemy forces, and properly identify and clear drop zone and landing zone areas and transmit this imagery to other integrated users to improve battlespace awareness for users and supporting forces as needed. They also require a synthetic vision capability in the Head-Up Display (HUD) to increase the tactical advantage of the C-17 during periods of night and instrument conditions.

C-32B: The C-32B provides dedicated rapid response worldwide airlift to the Commander, U.S. Special Operations Command, in support of the U.S. government domestic and overseas crisis response activities. The C-32 community requires an enhanced Flight Vision System technology, which would enable the flight crew to operate with reduced weather minimums, allowing improved placement and access for the aircraft’s no-fail federal government crisis response mission. The ANG C-32B also requires a Satellite Based Augmentation System (SBAS) to increase the reliability and accuracy of GPS operations and reduce the C-32B’s reliance on ground based navigational aids for terminal area guidance.

C-40: The C-40C provides worldwide distinguished visitor transportation for congressional, DoD, Air Force, and National Guard missions. 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. ANG C-40Cs also require a cabin interior refurbishment.

HC/MC-130: The ANG began the transition from the HC/MC-130 legacy to the HC-130J platform in FY 2017. The program will replace 13 legacy HC/MC-130s with 12 HC-130Js over the next three years. The 8.33 radio upgrade is necessary for the HC-130 to operate in the modern airspace structure. The Heavy Equipment Airdrop upgrade included several modifications which enables the aircraft to drop larger payloads.

HH-60G: ANG and the Air Force Reserves are working together to test and field the Blue Force Tracker 2 and Link-16 system to build the crews and C2 situational awareness. A Full Motion Video capability will be added to the aircraft with the procurement of Rover 6 for the HH-60. A helmet mounted heads up display will provide, within the field-of-view of the aircrew, flight data as well as the geographic location of friendly, hostile, and survivor positions. ANG HH-60Gs require an integrated defensive suite capable of defeating infrared threats while providing aircrew with accurate and precise indications of radio frequency threat systems with an associated audio warning. The ANG will begin receiving 18 refurbished HH-60Gs in 2019 to fill its authorized requirement.

KC-135: ANG KC-135 units provide 44 percent of the total Air Force fleet. The KC-135 must be prepared to operate in high-threat areas of operation. To safeguard against man-portable air defense systems, the ANG is leading the integration of the LAIRCM system. A 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 Tactical Data Link. RTIC was successfully demonstrated and initial funding was provided in FY 2018 for non-recurring engineering. Currently, there is no internal ground cooling capability on the KC-135 aircraft, with flight deck temperatures often reaching up to 160 degrees Fahrenheit in many deployed locations. The KC-135 ground cooling capability has been identified as a critical requirement to ensure mission requirements are achieved. For future operations in contested GPS environments, a jam-resistant GPS will be essential to successful operations, and jam-resistant GPS is identified as a critical capability for the KC-135. ANG KC-135s also require manned, portable aircraft-powered ground transfer fuel pumps to unload/offload fuel in an adaptive basing scenario or forward deployed environment where ground support is unavailable.

B. Changes since the Last NGRER

While the FY 2019 Defense Appropriation improved the Air Force's budgetary bottom line, there are still fundamental challenges to the sustainment, modernization, and recapitalization of the ANG's legacy equipment. The Air Force has made difficult decisions to meet operational requirements by continuing to invest heavily in fleet recapitalization and compliance initiatives, leaving some critical ANG fleet modernization requirements and initiatives "below the line." ANG continues to work within Air Force and DoD requirements development, acquisitions, and test processes to ensure that ANG's fleet of aircraft is safe, modern, and fully integrated.

Provided below is a list of significant on-going changes since the publication of the previous NGRER:

- F-35 Lightning II being established at 158th Fighter Wing, Burlington, VT.
- KC-46 Pegasus being established at 157th Air Refueling Wing, Pease, NH.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements provides projected FY 2020–FY 2022 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 2020–FY 2022.

4. Anticipated Withdrawals from ANG Inventory

Table 5 also lists planned ANG major equipment withdrawals for FY 2020–FY 2022, 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

The three lines of effort established by the Director, Air National Guard, "Readiness for Today's Fight," "21st Century Guard Airmen," and "Build for Tomorrow's Fight" require the innovative modernization of ANG assets. Continuously improving our aging assets must remain a priority as the ANG is currently supplementing Air Force Major Commands with combat-ready contingency forces in every corner of the world, at some of the highest rates seen since the inception of the Global War on Terror. Though not an all-inclusive list, some expected shortfalls for these lines of effort include F-15/F-16 AESA radars, Multi-Mission Design Series RTIC, and the C-130 Global Airspace Access and Modernized Cockpit Instrumentation. This document provides further clarification on equipment and modernization shortfalls anticipated through the end of FY 2021 in the description of individual weapons systems modernization 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 Director, Air National Guard's Priorities and Lines of Effort: 1) Readiness: Today's Fight; 2) 21st Century Guard Airmen, and 3) Build for Tomorrow's fight. However, the ANG cannot depend upon appropriations within the Air Force budget alone as they do not fully support our efforts to fill shortages and modernize in order to keep pace with the AC. The supplemental appropriations made to the National Guard and

Reserve Equipment account will enable the ANG to field relevant-ready forces to meet any requirement.[6]

In closing, we can build the force we need for tomorrow's fight...but we need your help to sustain the long-term development of our Airmen, continue to modernize our weapon systems for the technically-advanced conflicts of the future, and sustain the decades of investments that the American people have made to build the world's greatest air power. Readiness is inherently in decline or on the rise, often proportional to the level of competition. Our force structure, based on a Cold War foe, was able to meet the competition of non-peer conflict for nearly three decades. However, pacing threats have now expanded the competitive space to new levels. They have closed gaps in their capability and capacity, and they've made clear their intent to seize advantages, at speed.

- Lieutenant General L. Scott Rice, Director, Air National Guard

[6] Written statement of Lt Gen L. Scott Rice, Director, Air National Guard to House Committee on Armed Services, Subcommittee on Readiness, 14 February 18, p. 9.

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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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Air Refueling							
Air Refueling, KC-135R	KC-135R	$57,640,000	140	140	140	140	140
Air Refueling, KC-135T	KC-135T	$57,629,000	24	24	24	24	24
Air Refueling, KC-46A	KC-46A	n/d	12	12	12	12	12
Airlift							
Airlift, C-130H	C-130H	$26,700,000	122	121	121	121	121
Airlift, C-130J	C-130J	$62,740,000	16	26	26	26	26
Airlift, C-17A	C-17A	$246,515,900	49	49	49	49	49
Airlift, LC-130H[1]	LC-130H	$21,396,000	10	10	10	10	10
Electronic Warfare (EW)							
EW, E-8C	E-8C/AOT	$245,800,000	13	12	12	12	12
EW, EC-130J	EC-130J	$54,171,000	7	7	7	7	7
EW, RC-26B	RC-26B	$8,175,000	11	11	11	11	11
Fighter							
Fighter, A-10C	A-10C	$10,800,000	85	42	42	42	42
Fighter, F-15C	F-15C	$26,690,000	123	123	123	123	123
Fighter, F-15D	F-15D	$27,290,000	14	14	14	14	14
Fighter, F-16C	F-16C	$8,225,000	288	269	269	269	269
Fighter, F-16D	F-16D	$10,470,000	44	44	44	44	44
Fighter, F-22A	F-22A	$172,450,000	20	20	20	20	20
Fighter, F-35A	F-35A	n/d	20	20	20	20	20
Operational Support							
Op Support, C-32B	C-32B	$72,543,000	2	2	2	2	2
Op Support, C-40C	C-40C	$77,300,000	3	3	3	3	3
Rescue							
Rescue, HH-60G	HH-60G	$14,334,000	17	17	17	17	17
Rescue, HC-130J	HC-130J	$73,358,000	8	12	12	12	12

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Miscellaneous Equipment							
MD-1A	MD-1A	$1,600,000	34	34	34	34	34
MD-1B	MD-1B	$1,600,000	14	14	14	14	14
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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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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Air Refueling			
Air Refueling, KC-135R	KC-135R	57	
Air Refueling, KC-135T	KC-135T	59	
Airlift			
Airlift, C-130H	C-130H	29	
Airlift, C-130J	C-130J	14	
Airlift, C-17A	C-17A	19	
Airlift, LC-130H	LC-130H	33	
Electronic Warfare (EW)			
EW, E-8C	E-8C	49	
EW, EC-130J	EC-130J	18	
EW, RC-26B	RC-26B	24	
Fighter			
Fighter, A-10C	A-10C	38	
Fighter, F-15C	F-15C	35	
Fighter, F-15D	F-15D	34	
Fighter, F-16C	F-16C	38	
Fighter, F-16D	F-16D	30	
Fighter, F-22A	F-22A	13	
Operational Support			
Op Support, C-32B	C-32B	15	
Op Support, C-40C	C-40C	15	
Rescue			
Rescue, HH-60G	HH-60G	26	
Miscellaneous Equipment			
MQ-1B	MQ-1B	8	
MQ-9A	MQ-9A	5	

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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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2018 would be expected to arrive in RC inventories in FY 2019 or FY 2020. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Helmet Mounted Cueing System	$7,500,000		
CAF Communications Suite Upgrade	9,900,000		
CAF Avionics Upgrades	21,696,000		
CAF Defensive Systems Upgrades	6,950,000		
Advanced Targeting and Radar Enhancements	10,000,000		
CAF Combat Operations Enablers	6,210,000		
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications and Avionics	14,670,000		
MAF Defensive Systems	18,800,000		
C-130/KC-135 Interior/Exterior Night Vision Lighting	1,090,000		
Personnel Recovery / Special Operations			
HH-60G Communication, Avionics, Data Link, and Defensive Upgrade	11,425,000		
EC-130 Avionics, and Defensive System Equipment	1,750,000		
Battlefield Airmen/Special Tactics/Guardian Angel/Joint Terminal Attack Controller Equipment	10,516,126		
Simulation / Distributed Mission Operations (DMO) / Training			
MAF Simulators	10,475,000		
CAF Simulators	14,890,000		
Distributed Mission Operations / Live Virtual Construct Equipment	4,355,000		
ANG Range and Instrumentation Upgrades	1,601,000		
Command and Control (C2) Simulators (AOC, BCC, CRC, DCGS, JSTARS)	4,020,000		
Intelligence, Surveillance, and Reconnaissance (ISR) Simulators (RC-26, MC-12, RPA)	2,530,000		
Space, Cyber/Information Operations (IO), Command and Control (C2), and Intelligence, Surveillance, and Reconnaissance (ISR)			
Cyber Training Equipment/Cyber Operations Modernization	3,075,000		
Command and Control (C2) Systems and Comm/Link Modernization	14,075,000		
Space Systems and Training Equipment Upgrades	5,068,000		
Intelligence, Information, Imagery, Analysis, and Assessment Upgrades	300,000		
MQ-9 Communications and Ground Station Upgrades	2,850,000		
MQ-9 Data Link, Advanced Podded Sensors and Systems	5,000,000		
RC-26B Avionics, Communications and Sensor Upgrades	10,849,800		
E-8C Joint Surveillance Targeting Attack Radar System (JSTARS) Communication and System Upgrade	9,875,000		
Agile Combat Support			
Logistics Support Equipment	2,248,200		

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Logistics Test Equipment	3,444,000		
Public Health and Medical Services Equipment	2,274,274		
Mass Care Support Equipment	3,276,000		
Explosive Ordnance Disposal Robots and Equipment	4,157,000		
Fire Fighting Equipment and Vehicles	1,729,600		
Emergency Management Equipment	4,000,000		
Security Forces Equipment and Vehicles	16,900,000		
FY 2018 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Helmet Mounted Cueing Systems		$750,000	
CAF Communications Suite Upgrades		16,346,250	
CAF Avionics Upgrades		48,136,374	
CAF Defensive Systems Upgrades		27,000,000	
CAF Advanced Targeting Pods		18,740,000	
CAF Combat Operations Enablers		7,755,000	
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications Suite Upgrades		16,170,000	
MAF Defensive Systems Upgrades		24,000,000	
MAF Podded Sensors		5,000,000	
MAF Propulsion Upgrades		3,000,000	
MAF Airlift Operations Enablers		3,090,000	
Personnel Recovery, Special Operations, and Battlefield Airmen			
HH-60G Communication, Avionics, and Defensive Systems		11,745,000	
EC/HC-130 Communications, Avionics, Defensive Systems, and Equipment Bins		15,800,000	
Guardian Angel / Special Tactics / Tactical Air Control Party Equipment		4,485,000	
Space, Cyber/Information Operations (IO), Command and Control (C2), and Intelligence, Surveillance, and Reconnaissance (ISR)			
Space Operations and Training Equipment		8,950,000	
Cyber Operations and Training Equipment		17,273,500	
Intelligence, Information, Imagery, Analysis, and Assessment.		6,232,000	
C2 Operations and Training Equipment		16,500,000	
ISR Communications, Avionics, Defensive Systems, Operations Enablers Upgrades		25,400,000	
E8-C Joint Surveillance Targeting Attack Radar System (JSTARS) Communication and Systems		15,500,000	
Simulation, Distributed Mission Operations (DMO), and Ranges			
CAF Simulators		18,370,000	
MAF Simulators		3,515,000	
Personnel Recovery / Special Operations Simulators		1,000,000	
C2 Simulators (AOC, BCC, CRC, DCGS, JSTARS)		2,508,000	
ISR Simulators (RC-26, MC-12, RPA)		1,650,000	
Distributed Mission Operations / Live Virtual Constructive Equipment		4,755,000	
ANG Range and Information Upgrades		9,900,000	

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Agile Combat Support			
Logistics Support Equipment		11,760,000	
Logistics Test Equipment		1,125,000	
Public Health and Medical Services Equipment		3,704,000	
Mass Care Support Equipment		7,400,000	
Civil Engineering and Explosive Ordnance Disposal		6,930,000	
Fire Fighting Equipment		5,517,000	
Emergency Management Equipment		22,580,000	
Security Forces Equipment		36,412,876	
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

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Distributed Mission Operations / Live Virtual Constructive Equipment			4,039,000
ANG Range and Information Upgrades			3,300,000
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	**$247,500,000**	**$429,000,000**	**$421,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Airlift					
Airlift, C-130H	C-130H	-1			
Airlift, C-130J	C-130J	+10			
Electronic Warfare (EW)					
Electronic Warfare, E-8C	E-8C	-1			
Fighter					
Fighter, A-10C	A-10C	-43			
Fighter, F-16C	F-16C	-19			
Fighter, F-35A	F-35A	+18			

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Airlift, C-130H	C-130H	-2	n/d				
Airlift, WC-130H	WC-130H	-8	n/d				
Fighter, A-10C	A-10C	-21	n/d				
MD-1A/B	MD-1A/B	+1	n/d				
MQ-9A	MQ-9A	+16	n/d				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Modification of Inservice Aircraft							
F-15				$161,779,000	$166,153,000		
F-16				349,000	0		
F-22A				5,132,000	16,913,000		
C-17A				256,000	732,000		
C-40				600,000	600,000		
C-130				0	525,000		
C-135				19,923,000	14,970,000		
E-8				17,259,000	16,801,000		
H-60				772,000	643,000		
Aircraft Replacement Support Equipment				603,000	603,000		
Vehicular Equipment							
Passenger Carrying Vehicles				231,000	232,000		
Medium Tactical Vehicle				2,346,000	2,341,000		
Runway Snow Removal and Cleaning Equipment				661,000	740,000		
Items Less Than $5M (Base Maintenance Support)				2,258,000	2,062,000		
Electronics and Telecommunications Equipment							
Air Traffic Control and Landing System				1,552,000	1,552,000		
Theater Air Control & Landing System				0	13,811,000		
Weather Observation Forecast				0	1,086,000		
General Information Technology				3,757,000	3,041,000		
AF Global Command and Control System				112,000	0		
Combat Training Ranges				0	2,434,000		
Theater Battle Management Command and Control System				150,000	0		
Air and Space Operations Center - Weapon System				1,752,000	0		
Tactical Communications-Electronic Equipment				1,288,000	6,435,000		
Base Communications Infrastructure				6,648,000	1,993,000		
Communications and Electronics Modifications				1,552,000	0		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
Other Base Maintenance and Support Equipment							
Night Vision Goggles				716,000	716,000		
Items Less Than $5M (Personal Safety and Rescue Equipment)				3,682,000	0		
Mechanized Material Handling Equipment				2,756,000	2,714,000		
Base Procured Equipment				1,041,000	1,034,000		
Items Less Than $5M (Base Support Equipment)				1,078,000	1,078,000		
Distributed Common Ground System (DCGS)-Air Force				0	9,828,000		
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Air Superiority / Global Precision Attack							
Advanced Targeting and Radar Enhancements						$14,370,810	$19,471,555
Combat Air Forces (CAF) Avionics Upgrades						53,021,835	38,105,356
CAF Defensive Systems Upgrades						13,691,593	12,133,676
CAF Simulators						9,030,000	9,030,000
CAF Helmet Mounted Cueing System						15,541,150	20,702,567
CAF Combat Operations Enablers						12,988,000	13,617,086
Rapiid Global Mobility							
C-130/KC-135 Tactical Data Link, Avionics, and Communications Upgrade						16,910,000	16,910,000
C-130H/LC-130 Podded Sensors						1,072,744	14,762,270
C-130H/J, KC-135, EC/HC/MC-130 Defensive Systems						38,100,000	36,793,622
C-130H/LC-130 Enhanced Engine and Propulsion Systems						10,000,000	1,700,000
C-130/KC-135 Interior/Exterior Night Vision Lighting						650,000	650,000
Personnel Recovery / Special Operations							
HH-60G Communication, Avionics, Data Link, and Defensive Upgrade						8,141,000	12,036,964
HC/MC/EC-130 Communication, Avionics, Cargo Compartment, Refueling, Engine, and Defensive System Upgrade						5,160,000	1,001,530
EC-130 Avionics, and Defensive System Equipment						1,756,000	1,756,000
Battlefield Airmen/Special Tactics/Guardian Angel/Joint Terminal Attack Controller Equipment						9,758,783	10,208,783
Simulation / Distributed Mission Operations / Training							
Battlefield Airmen Simulators						3,777,256	3,837,256
Mobility Air Forces (MAF) Simulators						2,835,000	2,475,000
Distributed Mission Operations / Live Virtual Construct						8,534,000	8,534,000
ANG Range and Instrumentation Upgrades						2,654,000	2,654,000
Command and Control (C2) Simulators (AOC, BCC, CRC, DCGS, JSTARS)						9,986,000	10,391,410
Intelligence, Surveillance, and Reconnaissance (ISR) Simulators (RC-26, MC-12, RPA)						1,570,000	1,570,000
Global Integrated ISR / Space Superiority / Cyberspace Superiority / C2 / Incident Awareness and Assessment							
Cyber Training Equipment/Cyber Operations Modernization						13,252,500	14,392,139
Command and Control (C2) Systems and Comm/Links Modernization						10,458,000	8,736,572
Space Systems and Training Equipment Upgrades						3,600,000	3,110,361
Intelligence, Information, Imagery, Analysis, and Assessment Upgrades						465,000	0
MQ-1/MQ-9 Communications and Ground Station Upgrades						1,250,000	2,881,018
MQ-1/MQ-9 Data Link, Advanced Podded Sensors and Systems						8,102,089	8,364,595

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
MC-12W Communications, Avionics, & Sensors						6,000,000	6,000,000
E-8C Joint Surveillance Targeting Attack Radar System (JSTARS) Communication and System Upgrade						6,012,000	7,512,000
Agile Combat Support							
Logistics Support Equipment						19,468,200	22,068,200
Logistics Test Equipment						3,638,250	538,250
Public Health and Medical Services Equipment						900,000	0
Mass Care Support Equipment						0	800,000
Explosive Ordnance Disposal Robots and Equipment						3,113,000	1,658,866
Fire Fighting Equipment and Vehicles						1,552,790	0
Emergency Management Equipment						9,525,105	7,943,757
Security Forces Equipment and Vehicles						3,114,895	7,653,167
Total				**$238,253,000**	**$269,037,000**	**$330,000,000**	**$330,000,000**

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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 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 2020 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 prioritized (PR) shortage list for major equipment items required for wartime missions but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded 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-130 Avionics Modernization Plan (AMP) Phase 1 and 2	134	134	$8,225,664	$1,102,238,976	This two phase program will first upgrade the C-130H fleet to comply with Federal Aviation Administration (FAA) Communication, Navigation, Surveillance / Air Traffic Management (CNS/ATM) requirements. These upgrades meet International Civil Aviation Organization 2020 requirements. AMP Phase 2 will upgrade analog displays to glass displays and provide the digital backbone necessary to allow continued modernization of the C-130H. Additionally, planned upgrades to navigation systems, defensive systems, and flight management hardware/software will provide operational effectiveness well into the future.
3	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.
4	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.

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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	C-130 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.
6	Digital Radar Warning Receiver (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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Table 8

Significant Major Item Shortages

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.
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.

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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	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.
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 Overview

"We can build the force we need for tomorrow's fight … to sustain the long-term development of our Airmen, continue to modernize our weapon systems for the technically-advanced conflicts of the future, and sustain the decades of investments that the American people have made to build the world's greatest air power."

- Major General Derek Rydholm, Deputy Chief of the Air Force Reserve

A. Current Status of the Air Force Reserve (AFR)

1. General Overview

The Air Force Reserve (AFR) faces a more complex and demanding environment than we have seen in generations. Great power competition has reemerged as the central challenge to U.S. prosperity and security and our relative advantage in air and space is eroding.[1] Today's modernization is tomorrow's readiness. Readiness is not static. It is inherently in decline or on the rise. We require the right size and mix of agile capabilities to compete, deter, and win in this environment.

Top Air Force Reserve Equipment Focus Areas

- **Aircraft Modernization** to maintain readiness and compatibility to support 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.
- **Fall Protection** to ensure compliance with safety standards and practices.

As a Major Command growing back to 70,000 Airmen, the AFR stands ready, as a principle contributor in all combatant command (CCMD) areas of responsibility, and in response to those who challenge U.S. prosperity and security. As a Major Command with Airmen rich in combat experience and years of engagement in conflict zones, our strength is still our seasoned talent, steeped in experience and postured for ready response.[2]

The Reserve is indispensable in every joint force operation, with over 6,500 Airmen serving on full-time orders around the world in all core missions of the Air Force. Our first responsibility is to integrate seamlessly with unmatched lethality as an equal member of the Total Force.[3] In line with the National Defense Strategy, the AFR continues to focus on readiness through theater specific training sets and weapon system modernization that addresses increased peer competition in today and tomorrow's battle space.

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[1] Statement of Lt Gen Maryanne Miller, Chief of Air Force Reserve: Hearings before the Senate Appropriations Subcommittee on Defense, Senate, 115th Cong. 1 (2018).
[2] Ibid.
[3] Ibid.

Restoring readiness is a key tenant of the current National Defense Strategy, and Weapon System Sustainment (WSS) is a critical component to accomplish this on Air Force aircraft and equipment. The Government Accountability Office's (GAO's) September 2018 Report to Congressional Committees on WSS showed significant sustainment challenges with respect to the supportability of aging platforms. While the report specifically addressed problems within the B-52, F-16, and C-17 fleets, all of which the AFR owns and operates, other mature platforms such as the A-10, C-130H and KC-135 share similar issues with diminishing manufacturing sources and increased WSS costs. The AFR airframes are some of the oldest in the Air Force inventory, averaging 37 years, nine years older than our Active Component (AC) counterparts. Within the Combat Air Forces (CAF) fleet, the AFR faces non-current fielding issues as the F-16 bridges the gap until the F-35 reaches full operational capability. While the Classic Association model leverages unique strengths of each component to capitalize on recruitment, retention and readiness, in order to also allow for synchronized training and resources, the AFR must fielded the same Mission Design Series (MDS) platforms concurrent with the AC. The key to success in achieving balance between today's fight and tomorrow's threat is investing in the right equipment and the right manning, and maintaining stable and predictable funding.

In response to increasing joint warfighter demands, the AFR established a new intelligence, surveillance, and reconnaissance (ISR) wing, 2 ISR groups, 14 intelligence squadrons, and added 9 intelligence targeteers. These organizations will support all four layers of the National Defense Strategy Global Operating Model: contact, blunt, surge, and homeland. The Global Operating Model describes how the Joint Force will be postured and employed to achieve its competition and wartime missions. FY 2019 and FY 2020 build on initiatives like this to further integrate the Air Reserve Components (ARC) in emerging missions like space and cyberspace. As the Air Force evolves, it's critical that the ARC maintain pace and parity to ensure its posture as a ready reserve.

The AFR fleet of 320 aircraft stands ready as a mix of agile capabilities to compete, deter, and win in joint and combined warfare. As critical members of the team, your AFR operates in a vast array of domains and prevails in every level of conflict. The AFR will remain focused on maintaining our advantage in order to continue providing our nation the security it enjoys.

a. 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 operations of an airbase as well as the enabling associated services (sustain), and recovery of coalition air and space forces. The AFR provides deployable combat support and mission generation capability to the Air Force in various mission areas:

- 20 percent of Air Force Explosive Ordnance Disposal capability
- 17 percent of Air Force Prime Base Engineer Emergency Force (Prime BEEF) civil engineer capability
- 18 percent of Air Force Rapid Engineer Deployable Heavy Operations Repair Squadron Engineers (RED HORSE) heavy construction capability

- 15 percent of Air Force Security Forces capability
- 9 percent of Air Force Petroleum, Oils, and Lubricants capability
- 9 percent of Air Force Material Management capability
- 10 percent of Air Force Ground Transportation capability
- 45 percent of Air Force Aerial Port 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. Presently, the AFR has an $11.4 million, 162 vehicle shortfall, and this is before the forecasted recapitalization across the Future Years Defense Program (FYDP), estimated to cost an additional $15 million. Despite this seemingly large disconnect, last year's NGREA funds purchased 13 new fire emergency services vehicles, recapitalizing a fleet that's been in service for over 18 years and mitigating the emergency response risk at seven Air Force Reserve Component (AFRC) locations.

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 develop that 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. Additionally, some of these resources, like fall protection equipment, are critical to the safety of AFR technicians and compliance with Occupational Safety and Health Administration (OSHA) policy. Changes in OSHA policy, requiring fall protection equipment for heights greater than 4 feet, rather than the previous 10 feet, drove the purchase of additional equipment that AFR could not forecast and had not programmed. Lacking enough regular funding to address these shortages, the AFR has used NGREA to close readiness gaps. For example, past NGREA expenditures procured replacement avionics flight control test sets that were becoming obsolete. These items support all AFR aircraft, enabling enhanced safety and increased expeditionary capability.

Additionally, mission conversions add new vehicle and support equipment requirements. For example, a high lift boom truck was not required while the 911 Airlift Wing (AW) at Pittsburgh flew the C-130H aircraft, but is required for the C-17. No excess high lift boom trucks are available and transferring one from other C-17 units would inhibit aircraft maintenance operations at the losing wing. New missions at the 914 AW, Niagara Falls, NY, and 940 Air Refueling Wing (ARW), Beale AFB, CA, are examples of aircraft conversions that drove similar equipment requirements. The command is using FY 2018 NGREA funds to close these gaps, enabling the units to reach full operational capability to support the National Defense Strategy and CCMD.

b. Combat Air Forces (CAF)

Approximately, 6 percent of the Air Force's CAF structure resides in the AFR. Currently, the AFR capabilities include B-52H, A-10C, F-16C, HH-60G, HC-130P, and Guardian Angel units. The AFR associates with the AC in the operation of F-15C/D, F-22, F-35, and B-1B weapon

systems. While the AFR does not own the aircraft in these operational areas, we still have requirements to provide equipment to the pilots who operate them.

Air Superiority, or the ability to control the air without prohibitive interference from an adversary, underwrites the full spectrum of joint operations. Increased threat capabilities, as well as the enemy's ability to engage in space and cyberspace, have exposed gaps in the Air Force's projected force structure. As a result, the Chief of Staff of the Air Force chartered the Air Superiority 2030 (AS 2030) Enterprise Collaboration Team. The purpose of the charter was to develop capability options to enable joint force air superiority in the highly contested environment of 2030 and beyond. The charter examined needs, and explored materiel and non-materiel, multi-domain solutions to mitigate these gaps. Ultimately, recognizing that no "silver bullet" solution existed, the charter recommended the USAF develop a family of systems within five capability development areas: Basing and Logistics; Find, Fix, Track and Assess; Target and Engage; Command and Control; and Non-Materiel (doctrine, organization, training, materiel, logistics, personnel, facilities, and policy). Developing next generation systems along these lines of effort is vital to ensuring air superiority in 2030 and beyond. In addition to pursuing new capabilities and modernizing 5th generation fighters, the Air Force also seeks to extend the service life and modernize critical capabilities of key 4th generation aircraft, 80 percent of the current fleet. Fighter fleet capacity is predicated on the capabilities of the aircraft that make up that fleet and thus, finding the right balance of 5th and 4th generation aircraft will remain fluid as we continually assess evolving threats.

A-10: The A-10C Thunderbolt II is a multi-role ground attack fighter. The AFR owns 55 A-10 aircraft, 19 percent of the AF fleet, dispersed between Whiteman AFB, MO, and Davis-Monthan AFB, AZ. The Air Force continues to assess fleet sustainability and alternatives for meeting warfighter close air support (CAS) demands, particularly in permissive environments. The A-10 has been the backbone of the CAS mission for more than 40 years. This year the original A-10 re-winging program concludes as the 173rd wing set will be installed. Additionally, a new re-winging program began in third quarter of FY18 with future planning for up to 109 additional wing replacement sets. The new wing program aims to avoid any further groundings beyond 2025 and will ensure a minimum of six combat squadrons remain in service until 2032. The current fleet force structure for the Total Force mix is being considered as part of FY 2020 program budget review. The ongoing debate about the future of the A-10 platform has created programmatic uncertainty as to whether further modernization of the fleet should be undertaken. Without comparable replacement, the decrease in training asset and aircraft availability will hinder our Battlefield Airmen from achieving CAS proficiency.

F-16: The F-16 Fighting Falcon provides air-to-air and air-to-ground combat capabilities in a single-engine multi-role tactical fighter aircraft. The AFR owns 54 F-16s, just under 6 percent of the total fleet, residing at Naval Air Station Joint Reserve Base, Ft. Worth, TX, and Homestead ARB, FL. The AFR also teams with Air Combat Command to provide over 600 Reservists to man three classic associate units at Luke AFB, AZ, Hill AFB, UT, and Shaw AFB, SC. The AFR's aircraft are the oldest in the fleet at 30 years old, and are 3–6 years older than the other components. The AFR fleet are all "pre-block" aircraft, meaning that they do not have as robust an avionics suite and radar capability, limiting their battlespace awareness and usefulness in a mixed fleet fight, particularly against 5th generation aircraft. Currently, the AFR F-16C fleet is not projected for the service life extension program. Rather, the current program of record

reflects that the mission will be recapitalized through replacement with F-35s or newer, more capable F-16s. However, the current service life projection expires prior to new aircraft delivery, driving us to look at select modernization through radar upgrades to maintain relevance to the CCMD. To ensure the F-16's lethality and air prominence in permissive environments, the AFR is pursuing an active electronically scanned array (AESA) radar upgrade that offers advanced capabilities and improved reliability and maintainability. The AFR would also like to upgrade the mission computer, display generator, electronic warfare components, and the ALQ-131 self-protection jamming pod to enable advanced technology jamming techniques. These modernization efforts are not currently part of the program of record in regular appropriation.

HH-60G: The HH-60G Pave Hawk's mission is to conduct day or night operations into hostile environments to recover downed aircrew or isolated coalition personnel. The AFR owns 15 HH-60G aircraft, 15 percent of the total fleet, residing at Patrick AFB, FL, and Davis-Monthan AFB, AZ. At 28 years old, the current aircraft have limited command and control capability, which hampers the ability for personnel recovery, inter-fly with attack assets, and joint interoperability. Additionally, the current offensive and defensive capabilities are insufficient to survive major combat operations without extensive force packaging. Our planned investments, to be funded using NGREA, will improve this platform's situational awareness and provide improved data links to both ground personnel and other airborne assets, enhancing its ability to complete its primary missions of Combat Search and Rescue and Personnel Recovery. The plan in the next FYDP includes recapitalizing this fleet, approximately six years after the AC replaces theirs.

HC-130N: The HC-130N is the only dedicated fixed-wing Personnel Recovery platform in the Air Force inventory. The HC-130N provides 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 inventory is currently zero based on four aircraft (HC-130P variants) being retired due to long standing corrosion and maintenance issues. However, four HC-130N models are on loan from the Alaska Air National Guard (ANG) at Patrick AFB, FL, and will remain there until they retire as part of the HC-130J recapitalization plan. However, the ANG retains possession for fleet inventory. The AFR is scheduled to recapitalize the fleet in early FY 2020 as they begin receiving HC-130J aircraft. The unit is programmed to operate a total of six aircraft.

B-52: The B-52H will continue its proud tradition of service through 2040, putting the fleet at nearly 90 years of service. The B-52H Stratofortress serves as the workhorse of the conventional bomber fleet, possessing intercontinental range and a large, diverse weapons payload. As expected on a 60 year old platform, parts obsolescence and diminishing manufacturing sources plague the community, costing valuable aircraft availability to enhance mission readiness. To sustain this venerable capability, there are a number of modernization efforts currently in work to include new engines, replacement radar, improved/integrated avionics, weapons management, and communication upgrades. 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 Formal Training Unit (FTU), providing 100 percent of the formal training for B-52 aircrew combat employment.

Guardian Angel: Guardian Angel (GA) is subset of the Battlefield Airman (BA) weapon system consisting of Combat Rescue Officers (CROs), Pararescuemen, and Survival, Evasion,

Resistance, and Escape (SERE) specialists operating together to provide a dedicated capability to locate and recover isolated personnel in support of Combat Search and Rescue (CSAR) and Personnel Recovery (PR) programs. The AFR GA personnel and equipment are assigned to Patrick AFB, FL, Davis-Monthan AFB, AZ, and Portland International Airport (IAP), OR. These units do not possess their own aircraft and are reliant on other organizations to account for their priorities to accomplish the mission. GA is currently and continuously deployed to multiple areas of responsibility with a limited ability to perform personnel recovery operations at sites requiring infiltration using utility terrain vehicles (UTVs). Having the Tactical Rapid Insertion Ground Recovery Systems (TRIGR) in their inventory, currently planned to be funded using NGREA, significantly lessens the risk to operating personnel and the survivors they're trying to recover.

c. Mobility Air Forces (MAF)

Fifty-four percent of the AFR capability exists in the MAF, which contributes a significant number of aircrews in diverse mission areas at the highest levels of force readiness. For the Total Force, the AFR holds

- 18 percent of aerial refueling capability,
- 18 percent of tactical airlift capability,
- 60 percent of Aeromedical Evacuation capability,
- 33 percent of Air Mobility Operations Squadrons,
- 25 percent of Air Force aerial firefighting capability,
- 56 percent of the Airlift Control Flights,
- 100 percent of the C-5 FTU pipeline,
- 100 percent of Air Force aerial spray mission, and
- 100 percent of the Air Force's weather reconnaissance mission.

KC-135R: The KC-135R Stratotanker provides air refueling, airlift, and aeromedical evacuation capabilities. The AFR owns 72 KC-135R aircraft, 18 percent of the Total Force fleet that has been extending force projection for over 60 years. The tanker fleet is one of the most heavily tasked in support of current overseas contingency operations, as well as at home to act 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 find defensive systems for this airframe to enable its ability to get even closer to the fight. Additionally, in anticipation of KC-46 conversions and KC-10 divestiture, the AFR postured its existing KC-135 fleet to better support the warfighter. With added KC-135s provided from the AC's tanker recapitalization, the AFR converted aircraft at Niagara ARB, NY, and re-opened a tanker unit at Beale AFB, CA. However, limited resourcing and a shortage of support equipment adversely impacted the AFR's ability to become fully operational at these units. This issue is being rectified with FY 2018 NGREA funds.

C-130H: The C-130H Hercules is a multi-role cargo platform that now resides completely in the ARC. The AFR owns and operates 48 C-130H aircraft, 26 percent of the fleet, and provides Modular Airborne Firefighting System capability and Modular Aerial Spray System (MASS) capability, in addition to its cargo carrying and delivery roles. The MASS is tasked as the only large area fixed-wing aerial spray capability within DoD to control disease-carrying insects, pest insects, and oil spill dispersal, and its capabilities were used extensively in Hurricane Harvey relief. The platform requires Avionics Modernization Program (AMP) upgrades through the Automatic Dependent Surveillance-Broadcast (ADS-B) system to comply with international airspace regulations by 2019. These upgrades are part of the program of record. However, the readiness of this legacy system is diminished by parts obsolescence in some of the air cooling fan components used to regulate avionics systems. These defects impact the aircraft's availability to operate, not just internationally, but particularly in hot and austere locations that do not have ground support equipment. Furthermore, the AFR C-130H fleet requires propulsion upgrades to overcome their current deficiencies in high density altitude environments and mitigate growing maintenance and sustainment costs of legacy systems.

C-130J: The C-130J is the latest and most technologically advanced model of the C-130, with increased fuel efficiency, greater range, and increased reliability and maintainability compared to previous models. The AFR owns 10 C-130Js and 10 WC-130J aircraft residing with the 403rd Wing stationed at Keesler AFB, Mississippi. Unique to the AFR, the 53rd Weather Reconnaissance Squadron provides ongoing Hurricane Hunter support to National Hurricane and National Winter Storm operation plans. In 2017, the AFR's WC-130Js proved instrumental in simultaneously tracking Hurricanes Harvey, Irma, and Marie, affecting Texas, Louisiana, Florida, the Caribbean Islands, and several other gulf and eastern seaboard states. Their impact was no different in 2018 for Hurricanes Florence and Michael, affecting the Carolina's and the Florida panhandle. These aircraft will need modernization of communications, navigation, and surveillance capabilities to meet the same air traffic management and flight safety standards for ADS-B in 2019. The AFR used NGREA funding to complete a software upgrade to the Aerial Reconnaissance Weather Officer station.

C-5: The AFR currently possesses 16 C-5 Galaxy aircraft. The Air Force just completed the Reliability Enhancement and Re-engining Program, marking the entire inventory's conversion to the C-5M. This is the first major upgrade of the C-5 fleet in its 30 year service life, projected to improve performance and reliability by more than 25 percent. The AFR C-5M fleet is split between the two unit-equipped operating bases in Westover, MA, and Joint Base San Antonio Lackland (JBSA Lackland), TX. JBSA Lackland is home to the Air Force's only C-5M FTU supporting pipeline aircrew training for the Total Force community.

C-17: The C-17A Globemaster III provides the Air Force with inter-theater and intra-theater airlift. The AFR owns 18 C-17s, with an additional 8 projected to transfer in 2019 from the AC to Pittsburgh ARB, PA, a previous C-130 unit. As part of this unit re-missioning, infrastructure, to include aircraft simulators, and C-17 support equipment must be purchased to ensure aircrew and maintainer training and proficiency in support of mission readiness. As an example of NGREA success, engine maintenance stands were procured with the FY 2018 appropriation, enabling the unit to conduct engine inspections more safely and efficiently.

C-40C: The C-40C provides worldwide air transportation for the Executive Branch, congressional members and delegations, DoD officials, and high-ranking U.S. and foreign dignitaries, as well as other numerous operations support requirements. The AFR owns and operates four C-40C aircraft, 36 percent of the total fleet, all residing at the 932nd Airlift Wing, Scott AFB, IL. The officials carried on this platform require the ability to conduct time-critical business via internet, email, and phone while airborne, driving communications hardware and software upgrades. Furthermore, the addition of crew rests seats will enable longer flight duty periods with greater crew comfort, preventing future injury.

2. Current Status of Equipment

a. Equipment On-hand (EOH)

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, 2018, AFR possessed 186 of the 320 aircraft assigned to the inventory. The difference between possessed and assigned is due to aircraft in scheduled Programmed Depot Maintenance (PDM), an element of Weapon System Sustainment (WSS) efforts to reconstitute aircraft readiness. No major equipment end strength changes are planned or projected in FY 2019.

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, 2018. The average age of AFR aircraft ranges from 10 years for the C-40Cs 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, the HH-60 helicopters undergoing PDM spent an average of 332 days in maintenance in FY 2017, a more than 40 percent increase from the 233 days in FY 2007, largely in part due to aging airframe issues. Furthermore, spare parts for legacy aircraft are not readily available due to the industrial base's 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), a.k.a. the Boneyard, at Davis-Monthan AFB, to pull parts off retired aircraft to sustain the needs of the field. However, this supply point, while used a last resort, is finite and cumbersome to tap. It increases maintenance downtime and decreases aircraft availability, and therefore 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 upgrades to be technically compliant with emerging requirements and to be compatible with the Total Force in order to seamlessly provide support to Air Force and joint missions. Achieving and maintaining a technically compatible AFR 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 can close capability gaps. However, recapitalization programs often do not include the AFR's legacy systems. As a result, incompatibility challenges exist within the AFR's aging fleet of HC-130, C-130H, KC-135R, A-10, F-16C, and HH-60 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 issue also affects support equipment. For instance, our Battlefield Airmen often find compatibility challenges between their unit-purchased individual field equipment and that specified by the AC training schoolhouse, degrading the effectiveness of the training received and potentially affecting integration downrange.

d. Maintenance Issues

AFR is tracking several fleet-wide issues. Some issues span multiple platforms. For example, the expiration of contracts for parts through Defense Logistics Agency (DLA) causes spare part shortages or shortfalls in support equipment for the establishment or re-missioning of AFR units. The AFR also has corrosion concerns which the Air Force Corrosion Office is currently examining.

F-16: Diminishing resources and increasing structural repairs continue to affect aircraft availability and readiness. Specifically, the left and right main landing gear collars continue to be manufactured at a lower rate than required by demand resulting in 30-day increase in aircraft down time for gear inspections. The 7th Stage Low Air Valves have been a systemic issue. The vendor was producing parts that did not pass Air Force quality standards and had to start a new manufacture line, resulting in delays. Additionally, the block 30 aircraft will be going through a 144-day programmed structural sustainment and repair inspection at the depot, impacting aircraft availability. Each day of additional aircraft down time is a day the warfighter does not have this capability guarding the skies overhead.

A-10: Fleet readiness is challenged due to parts supportability. Specifically, Centralized Integrated Control Units have been the highest driver of “not mission capable” aircraft across the Air Force fleet and continue to cause aircraft down time. This aircraft component integrates on board weapons stores with avionics capabilities in the cockpit. Without this function, the aircraft is unable to execute combat missions or effective training sorties. Additionally, the uncertainty of the future of the A-10 program with respect to the budget led to shortages in the wing replacement program due to production stand down, affecting 45 percent of AFR aircraft. The flight hours of the wings have reached end of service life and create concern of inflight structural failure if not replaced or overhauled. While there is a plan in the program of record to begin manufacturing new wings, force structure is still being debated and it’s too early to know how much of the AFR fleet will be affected.

B-52: Age and corrosion issues affecting the B-52 fleet require major structural repairs and are lengthening repair times, both in field-level phase inspections and in PDM days, which takes an aircraft out of the fight for an average 292 days. In some instances, certain structural components have not been manufactured before or are produced at low rate and have a long lead time to manufacture. For example, one particular damaged skin panel has been through three cycles of PDM over 15 years, without being replaced because no one makes the part. Parts sustainment has continually hampered maintenance repair capability operationally impacting the production of Full Mission Capable (FMC) systems aircraft and Combat Capable aircrews in the FTU. Specifically, non-availability of the Forward Looking Infrared (FLIR) system sensor and Multi-Functional Color Display has impacted mission readiness.

C-130: This fleet is experiencing part supportability issues, but because of fleet size and age, the Aerospace Maintenance and Regeneration Group (AMARG), Davis-Monthan AFB, AZ, (a.k.a.

Boneyard) is generally exhausted as a source of supply. Contract and organic repair sites are struggling to conduct repairs due to shortages of parts. As examples, the Main Landing Gear (MLG) wheel assembly is lacking grease caps; the air-conditioning cooling turbine is lacking nozzles; the MLG Strut is lacking pistons and outer cylinders; and the Fuel Quantity Totalizer is lacking glass to complete overhauls/repairs. The System Program Office is working with parts program managers on solutions with manufacturers, but there is still un-filled demand in the field for all these parts. Additionally, the current C-130H propulsion system does not perform well in high-density altitude environments and drives excessive maintenance costs. Upgrading the T-56 engine with the 3.5 Engine Enhancement Package (EEP) will increase engine life span, improve fuel economy, reduce takeoff distance, 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 its support to its customers who count on it to get in and out of austere locations. However, modifications are limited to just one or two aircraft per month for each of these programs due to the company's limited capacity to produce the kits required for these modification programs. Aircraft availability will be an issue in FY 2019 due to all the aircraft mods scheduled, including AMP Increment 1 (Mode V/ADS-B Out), ALR-69A, and 3.5 Engine Upgrade. The AFR C-130H fleet will be complete with Electronic Propeller Control System modification by 1 May 2019.

KC-135: After 60 years of flight, many parts for this aircraft are no longer stocked or procurable, and there is an increased reliance on parts (i.e. Emergency Locator Transmitters, landing gear, throttle brackets, and legacy Auxiliary Power Unit starters) from AMARG. Additionally, expiring contracts and contracts not performing to the agreed standard are consistently driving mission capable rates down. The top drivers for FY 2018 included the following: main landing gear centering cylinder; common computing module (CCM); truck leveling switch; and forward/aft body fuel bladders. Unscheduled Depot Level Maintenance (UDLM) and follow on warranty work after PDM continues to negatively impact aircraft availability. Aircraft conversions at Seymour Johnson AFB, Niagara ARB, and Beale AFB impacted hangar availability, which in turn extended fuel system repair times and subsequently drove fly away requirements. At these same locations, lack of availability of support equipment and supply spares also negatively impacted aircraft availability. Beale has extended its fully operational capable date a full 12 months due to insufficient support equipment and manpower shortages in operations and maintenance. The command expects Niagara ARB to follow suit. Together the two bases have more than 600 un-filled requisitions for over 1,000 pieces of equipment.

C-5M: The Reliability Enhancement and Re-engining Program is complete. Contracted Logistics Support contract issues are significantly impacting "M" model parts availability. The smaller sized units (eight Primary Assigned Aircraft [PAA]) at JBSA Lackland impacted aircraft overall availability, FTU student pipeline output, and Airlift Squadron operations. Furthermore, future modifications through Time Compliance Technical Orders like Batman fittings, Color Weather Radar, and Pylon fitting replacements will affect aircraft availability.

HH-60: The fleet continues to experience severe corrosion issues based on geographic location and continuous utilization, as well as parts supportability limitations. Moving our depot inputs to Korean Airlines and their quality workmanship has dramatically improved our corrosion issues along with providing a cost savings equal to one-third of Corpus Christi Army Depot inputs. The AFR has also demonstrated that an older Corrosion Preventative Compound (CPC) is providing

better protection than the current authorized CPC for our locations. In first quarter FY 2019, the Air Force Reserve Command, AF Corrosion Office, and Analatom Engineering began conducting multiple studies on aircraft and facilities addressing the corrosive environments at Patrick AFB, FL. Meanwhile, the need for Depot Field Teams and UDLMs for corrosion repairs continue but have been reduced significantly by corrosion preventative measures taken by the unit, Numbered Air Force, and MAJCOM. Air Refueling Probes have been a constant issue in this regard. Additionally, recent contract parts repairs have failed to meet Air Force quality standards, specifically Main Rotor Blades. These deficiencies increase aircraft downtime and unavailability to the warfighter.

HC-130: This fleet is also experiencing part supportability issues, mainly due to the differences between aircraft in year models and modifications installed within the fleet. Due to the fleet size (five) and age, this fleet is dwindling and the AMARG Boneyard is generally exhausted as a source of supply. The AFR mainly relies on DLA, depot, and the standard base supply system. While not unique to the ARC, AFR's main concern is that contracts for parts are expiring and it's taking over six months to re-establish those contracts and get assets to the warfighter. The current AFR HC-130 legacy fleet is converting to HC-130J models in third quarter of FY 2020.

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 (PIRL) process; specifically, the AFR's unfunded, or underfunded, procurements or modernization programs affecting our 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. Modernization of aircraft and support equipment is required 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

Stagnation breeds obsolescence. If the AFR is to remain a combat-ready force, we must continue to evolve and adapt. The AFR accomplishes its mission with a fleet averaging 37 years of age, 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, in some cases, replacement. Our capability to deter, respond to, and eliminate threats relies upon our 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

Diminishing Manufacturing Sources and Material Shortages (DMSMS)/Obsolescence is an increasingly difficult problem for the DoD which affects readiness of AFR weapon systems 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 due to 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 National Defense Strategy'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. As an example, in February 2017, when KC-135 landing gear components began to break and the existing Air Force stock was depleted, there was a three month lead time to initiate the resupply contract with an additional 3–6 months for parts delivery.

Traditionally, efforts to mitigate the effects of DMSMS have been reactive—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 or mission changes have occurred within the AFR since the last NGRER. Over the last year, the AFR completed WC-130 upgrades to the Aerial Reconnaissance Weather Officer station, making the platform more capable of communicating with agencies in reporting weather information and events. FY 2018 NGREA funds enabled the beginning of the much needed propulsion upgrades in the AFR C-130 fleet, beginning with the special missions for firefighting and aerial spray, improving aircraft performance and efficiency. In 2018, the AFR accepted its last C-5M aircraft from the ongoing depot modification line, rounding out its new, smaller 16 PAA fleet size. The decision to reduce the AFR C-5M fleet from 42 PAA was made in 2010. Additionally, within the C-5 program, FY 2018 NGREA funding was able to start needed Real Time in the Cockpit mission computer upgrades that will enable these aircraft to communicate with other airborne and ground based capabilities to enhance the battlefield common operating picture. As previously planned, in FY 2020, the AFR will purchase the first HC-130J to begin recapitalization of its Personnel Recovery fleet; since the last update, regular appropriation was secured for the sixth and final aircraft in this fleet.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2022 Equipment Requirements

Table 1 Consolidated Major Item Inventory and Requirements provides projected FY 2020–FY 2022 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 2020 President's Budget request. *Table 4 NGREA Procurements* provides AFR planned NGREA procurements for FY 2017–FY 2019. 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 an increase in the number of HC-130J aircraft in FY 2019–FY 2020, and KC-46 growth in FY 2021.

3. Anticipated Transfers from AC to AFR

Table 5 Projected Equipment Transfer/Withdrawal Quantities lists planned AFR transfers for FY 2020–FY 2022. While multiple aircraft were loaned between units and components to accommodate mission requirements, no permanent transfers from or to the AC are projected across the FYDP.

4. Anticipated Withdrawals from AFR Inventory

Table 5 also lists planned AFR major equipment withdrawals for FY 2020–FY 2022, including the force structure changes discussed in Section II, paragraph B of this chapter. Over the FYDP, the AFR will convert 12 KC-135R aircraft to KC-46 aircraft. The AFR will also divest six C-130H models as part of a larger Air Force movement plan. Two of the C-130H aircraft will be retired and four will be transferred to the ANG. The AFR will gain three HC-130J models to support the rescue mission. The same mission is also set to gain one more HH-60 helicopter in addition to the one gained in FY 2018. Finally, the AFR will gain one F-16D from the ANG in FY 2020, in exchange for an F-16C that was transferred in FY 2018.

5. Equipment Shortages and Modernization Shortfalls at the End of FY 2022

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 against the threats in today's evolving environment. Many initiatives are already in work, such as 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. Other programs still require research, test, and evaluation to develop the capability, which are outside the lanes for NGREA. 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. Additionally, 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

Our 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 competitive space to new levels. They have closed gaps in their capability and capacity, and they've made clear their intent to seize advantages, at speed.

The nation requires full-spectrum ready air, space, and cyber power, now more than ever. America expects it; combatant commanders require it; and with your support, Airmen will deliver it. To that end, we are deeply appreciative of recent efforts to begin the return of fiscal order. Readiness is first and foremost about having enough trained people, and with recent approval of increased end strength, the AFR is on its way to that end. We must continue to invest in our equipment to ensure that readiness trajectory remains in an ascent.

While we did not seek the reemergence of competition, let there be no doubt, your AFR Airmen stand ready to defend the homeland, deter nuclear conflict and nuclear readiness, own the high ground in any conflict with air and space superiority and project global vigilance, reach, and power with our 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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Equip No.	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Air Refueling							
Air Refueling, KC-135R	KC-135R	$74,000,000	72	67	62	62	62
Air Refueling, KC-46A	KC-46A	n/d	3	12	12	12	12
Air Support							
Weather, WC-130J	WC-130J	$73,800,000	10	10	10	10	10
Airlift							
Airlift, C-130H	C-130H	$32,600,000	42	42	42	42	42
Airlift, C-130J	C-130J	$69,500,000	10	10	10	10	10
Airlift, C-17A	C-17A	$284,000,000	26	26	26	26	26
Airlift, C-5M	C-5M	$328,000,000	16	16	16	16	16
Airlift, C-40C	C-40C	$80,700,000	4	4	4	4	4
Bomber							
Bomber, B-52H	B-52H	$99,900,000	18	18	18	18	18
Fighter							
Fighter, A-10C	A-10C	$13,000,000	55	48	48	48	48
Fighter, F-16C	F-16C	$21,800,000	51	51	51	51	51
Fighter, F-16D	F-16D	$21,800,000	3	3	3	3	3
Rescue							
Rescue, HH-60G	HH-60G	$27,000,000	16	17	17	17	17
Rescue, HC-130J	HC-130J	$70,400,000	1	4	6	6	6

AFR

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 2019.

Nomenclature	Equip No.	Average Age	Remarks
Air Refueling			
Air Refueling, KC-135R	KC-135R	57	
Air Support			
Weather, WC-130J	WC-130J	17	
Airlift			
Airlift, C-130H	C-130H	26	
Airlift, C-130J	C-130J	14	
Airlift, C-17A	C-17A	17	
Airlift, C-5M	C-5M	30	
Airlift, C-40C	C-40C	10	
Bomber			
Bomber, B-52H	B-52H	57	
Fighter			
Fighter, A-10C	A-10C	38	
Fighter, F-16C	F-16C	31	
Fighter, F-16D	F-16D	31	
Rescue			
Rescue, HH-60G	HH-60G	28	

AFR

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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022
P-1R data from FY 2020 President's Budget Submission was not available in time for publication in the FY 2020 NGRER.			
The FY 2020 P-1R will be available on the Office of the Under Secretary of Defense (Comptroller) public web site (http://comptroller.defense.gov/Budget-Materials/) upon release of the FY 2020 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 2018 would be expected to arrive in RC inventories in FY 2019 or FY 2020. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019
FY 2017 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Day/Night Helmet Mounted Integrated Targeting (HMIT)	$2,200,000		
CAF Communications Upgrades	10,500,000		
CAF Avionics Upgrades	10,705,000		
CAF Defensive Systems Upgrades	7,600,000		
CAF Targeting and Radar Enhancements	25,605,000		
CAF Combat Operations Enablers	600,000		
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications and Avionics	2,200,000		
MAF Defensive Systems	10,000,000		
Special Operations / Personnel Rescue / Guardian Angel			
Personnel Recovery Situational Awareness (PRSA)	24,200,000		
Guardian Angel Wings Personnel Recovery Mission Equipment	4,400,000		
Special Mission			
WC-130J Aerial Reconnaissance Weather Officer Station Upgrade	500,000		
Simulation			
Global Strike Simulators	2,000,000		
Agile Combat Support			
Cyber - Small Communications Package	1,800,000		
Support Equipment	2,150,000		
Vehicles	190,000		
Unit Mission Equipment	150,000		
Expeditionary Forces	150,000		
Chief Information Officer (CIO) Equipment	50,000		
FY 2018 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Day/Night Helmet Mounted Integrated Targeting (HMIT)		$2,250,000	
CAF Communications Upgrades		17,500,000	
CAF Avionics Upgrades		10,650,000	
CAF Defensive Systems Upgrades		14,500,000	
CAF Targeting and Radar Enhancements		37,500,000	
CAF Combat Operations Enablers		2,448,000	
Global Strike Mission Debriefer		100,000	

National Guard and Reserve Equipment Appropriation (NGREA) Procurements

Nomenclature	FY 2017	FY 2018	FY 2019
Rapid Global Mobility			
Mobility Air Forces (MAF) Communications and Avionics		18,112,000	
MAF Defensive Systems		16,000,000	
MAF Propulsion Systems		12,000,000	
Special Operations / Personnel Rescue / Guardian Angel			
Personnel Recovery Situational Awareness (PRSA)		28,725,000	
Personnel Rescue		6,800,000	
Special Mission			
Special Mission		7,500,000	
Agile Combat Support			
Agile Combat Support		20,915,000	
FY 2019 NGREA Equipment			
Air Superiority / Global Precision Attack			
Combat Air Forces (CAF) Helmet Mounted Cueing Systems			$2,250,000
CAF Communications and Datalink Upgrades			11,500,000
CAF Avionics and GPS Upgrades			8,525,000
CAF Defensive Systems Upgrades			7,000,000
CAF Radar and Targeting Enhancements			31,145,000
CAF Combat Operations Enablers			980,000
Mobility Air Forces (MAF) Communications and Datalink Upgrades			22,000,000
MAF Defensive Systems Upgrades			25,000,000
MAF Combat Operations Enablers			4,800,000
Rescue Communication and Datalink Upgrades			26,850,000
Guardian Angel Mission Equipment			9,800,000
Special Mission			23,500,000
Simulators and Training Devices			3,350,000
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	**$105,000,000**	**$195,000,000**	**$200,000,000**

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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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks
Air Refueling					
Air Refueling, KC-135R	KC-135R	-5	-5		(-10) Tanker Conversion Plan
Air Refueling, KC-46A	KC-46A	+9			(+9) Tanker Conversion Plan
Fighter					
Fighter, A-10C	A-10C	-7			
Rescue					
Rescue, HH-60G	HH-60G	+1			(+1) increase to rescue mission
Rescue, HC-130J	HC-130J	+3	+2		(+5) increase to rescue mission

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 Planned Transfers & Withdrawals							
Air Refueling, KC-135R	KC-135R	+8	+8				
Airlifte, C-130H	C-130H	-8	-8				
Airlift, C-5A	C-5A	-6	-6				
Airlift, C-5B	C-5B	-8	-8				
Airlift, C-5M	C-5M	+6	+3				
FY 2016 Service Procurement Programs – RC (P-1R) Equipment							
Modification of Inservice Aircraft							
B-52				$14,112,000	$18,029,000		
C-17A				346,000	1,035,000		
C-40				1,200,000	1,200,000		
C-130				0	525,000		
C-135				7,927,000	6,820,000		
H-60				4,590,000	4,293,000		
Vehicular Equipment							
Passenger Carrying Vehicles				52,000	56,000		
Medium Tactical Vehicles				1,377,000	3,394,000		
Items Less Than $5M (Cargo and Utility Vehicles)				2,665,000	2,438,000		
Items Less Than $5M (Special Purpose Vehicles)				3,477,000	3,454,000		
Items Less Than $5M (Materials Handling Equipment)				2,962,000	2,795,000		
Runway Snow Removal and Cleaning Equipment				165,000	129,000		
Items Less Than $5M (Base Maintenance Support)				302,000	276,000		
Electronics and Telecommunications Equipment							
Air Traffic Control and Landing System				388,000	388,000		
AF Global Command and Control System				99,000	0		
Theater Battle Management Command and Control System				145,000	0		
Air and Space Operations Center - Weapon System				1,168,000	0		
Information Transport Systems				11,853,000	0		
Tactical Communications-Electronics Equipment				65,000	5,209,000		
Base Communications Infrastructure				326,000	282,000		
Communications and Electronics Modifications				388,000	0		
Other Base Maintenance and Support Equipment							
Night Vision Goggles				239,000	239,000		
Items Less Than $5M (Personal Safety and Rescue Equipment)				3,022,000	3,407,000		
Mechanized Material Handling Equipment				345,000	340,000		
Base Procured Equipment				127,000	126,000		
Items Less Than $5M (Base Support Equipment)				139,000	139,000		

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Table 6

FY 2016 Planned vs Actual Procurements and Transfers

Nomenclature	Equip No.	FY 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual
FY 2016 National Guard and Reserve Equipment Appropriation (NGREA) Equipment							
Multi-Mission Design Series (MDS) Day/Night Helmet-mounted Integrated Targeting (HMIT)						$19,000,000	$21,000,000
A-10/F-16 Anti-Jam Global Positioning System (GPS)						7,000,000	7,000,000
F-16/B-52 AN/ASQ-236 All Weather Targeting Capability						30,000,000	30,000,000
F-16 5th to 4th Generation Data Link						2,200,000	2,200,000
LITENING						12,000,000	12,000,000
F-16 Pylon Integrated Dispenser System (PIDS+) Missile Warning System						6,000,000	5,250,468
F-16 ALR-69A Radar Warning Receiver (RWR)						5,300,000	5,300,000
C-130 Yoke Mounted Switch						30,000	30,000
KC-135 Large Aircraft Infrared Countermeasures (LAIRCM)						15,253,364	15,253,364
C-130 Real Time Information in the Cockpit (RTIC)						700,000	700,000
KC-135 LOS/BLOS Data Link & Internet Protocol Capability						3,800,000	3,800,000
HC-130 Information Superiority ICS						750,000	1,499,532
F-16 3-Digital Intercom/Spatial Awareness Audio						4,220,000	4,220,000
F-16 2nd ARC-210 Mobile User Objective System (MUOS)						210,000	210,000
Side/Sector Scan SONAR						582,000	752,278
Maritime Communications Capability - 1 per Guardian Angel (GA) operator						750,010	581,609
Communications/Navigation for GAARC						402,640	0
Containerized Small Arms Range						1,839,990	1,889,539
Razor Light Tactical Vehicle Upgrade						920,000	1,271,213
C-17 Extended Range Modification with Enhanced On Board Inert Gas Generating System (OBIGGS)						10,000,000	10,000,000
C-130 Modular Aerial Spray System (MASS)						2,990,121	2,990,121
WC-130 Aerial Reconnaissance Weather Officer (ARWO) Station Upgrade						4,000,000	4,000,000
F-16 Advanced Identification Friend or Foe (IFF)						2,500,000	2,500,000
A-10 Parking Brake						1,750,000	1,750,000
F-16 Advanced Data Transfer Equipment (ADTE) - Supports Auto GCAS						3,000,000	1,000,000
Simulator Procurement and Upgrades						125,000	45,000
Support Equipment						3,912,645	3,912,645
Vehicles						489,594	486,394
Expeditionary Forces Tactical Equipment						274,636	357,836
Total				**$57,479,000**	**$54,574,000**	**$140,000,000**	**$140,000,000**

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 2020 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 but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Multi Domain Secure Communication/ Data Link (A-10 HC-130, C-5, KC-135, and C-17)	various	various	various	$122,000,000	Modern cryptographic requirements and changes to satellite communications drive radio modernization and the proliferation of tactical data networks (TDNs) for tactical battlespace awareness by aircraft as well as ground parties and command and control (C2) entities have raised the expectation of aircraft integration into existing networks. The expectation of data link integration has also increased the cost of not being integrated. Costs include loss of potential critical data to the aircraft, 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. (55 A-10s at a cost of $560K each; 6 HC-130s at a cost of $200K each;14 C-5's, 58 KC-135's, and 18 C-17's at $1M each for a total of $90M
2	Vehicle Sustainment/ Support	various	various	various	$28,985,000	Air Force Reserve Command (AFRC) provides vehicles for new missions, unit training, and sustainment of existing missions. Vehicle shortfalls range across all functional areas. As the average age increases, there is a direct correlation to a demand for more Operation and Maintenance (O&M) funding to maintain vehicles. Additionally, funding of fire servicing, fuels hydrant, and aircraft tow/servicing vehicles is at a critical point due to aging fleet, vacant authorizations, and new mission conversions. Vehicle acquisitions are chronically underfunded, receiving a relatively low priority.
3	Aircraft Defensive Systems (C-5, KC-135, F-16, A-10)	various	various	various	$221,750,000	Considering the proliferation of evolving missile threats, many of the legacy AFR aircraft do not have defensive systems that are relevant and effective, placing pilots and mission effectiveness at an increasing risk. Current programs to address the evolving threat defensive systems are: the Block 30 Large Aircraft Infrared Countermeasures (LAIRCM) for the 16 C-5 aircraft Group A and B at $2,187,500.00 each for a total of $35M due to a shortage in OCO funding from AMC, and 60 KC-135 Group A and 15 Group B for a total of $46M. The ALR-69A Digital Radar Warning Receiver in the F-16 and A-10, 55 A-10s and 54 F-16s at $0.8M each for a total of $87.2M. An active IR missile warning system into the F-16 Pylon Integrated Dispenser System Universal (PIDSU) pylon, 32 F-16s at $0.9M each for a total of $28.8M, and replace the current A-10 ALR-47 Infrared Missile Warning System with newer detectors capable of giving adequate warning to protect the aircraft, 55 A-10s at $0.45M each for a total of $24.75M.

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Table 8

Significant Major Item Shortages

PR	Nomenclature	Total Req'd	# Items Short	Item Cost	Total Shortage Cost	Rationale/Justification
4	Support Equipment	various	various	various	$125,000,000	Agile Combat Support (ACS) 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.
5	Propulsion Upgrades (C-130 Engine/ Propellers)	42	42	$6,047,620	$254,000,040	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.
6	Avionics Upgrades (A-10)	55	55	$400,000	$21,600,000	A-10 avionics displays in most legacy platforms are unable to match the signal quality of the information sent to them. Color high definition imagery is not displayed to the pilot. Targets are being missed and pilots are flying closer to the threats attempting to gain positive identification. Color high definition displays significantly improve mission success and safety while reducing pilot workload.
7	Radars (F-16)	54	54	$29,000,000	$156,600,000	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.
8	Simulators (C-5, C-17, C-130, A-10)	various	various	various	$53,500,000	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. HC-130J @ $23M; Guardian Angel Freefall Trainer @$7M; WC-130J Part Task Trainer @ $7M; Defensive Space Control simulator @ $7.4M; C-130H Electronic Prop and 3.0 Upgrades @ $3.25M; Global Strike simulators @ $2.1M; A-10C FMT Hi Resolution Display System @ $0.3M

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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	C-40 Crew Rest Seats	4	4	$1,250,000	$5,000,000	AFRC C-40 requires new crew rest seats to safely fly missions beyond the flight duty period from 16 hours to 26 hours. Four seats at $1,250,000 will allow the crew members to lie flat in the horizontal position (not angled) with isolation from noise and disturbances taking place in the main cabin.
10	High Speed Data (HSD) Internet Addition/ Replacement (C-40)	4	4	$10,000,000	$40,000,000	The C-40C provides worldwide air transportation to Congressional Members and Delegations (CODELs), the Executive Branch, Department of Defense (DoD) officials and other high ranking dignitaries. C-40C high visibility passengers require the ability to conduct time-critical business via Internet, email, and phone while airborne. As commercial industry moves away from legacy voice and data transmission systems, the C-40C fleet must adapt to a new internet service model. (4 C-40s at $10M each)

Chapter 6
United States Coast Guard Reserve (USCGR)

I. Coast Guard Overview

For more than two centuries, the United States Coast Guard (USCG) has performed increasingly complex missions in the most challenging of marine environments. In that time, our responsibilities have continuously expanded to encompass every aspect of maritime governance. By statute, the Coast Guard is an Armed Force, 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 Coast Guard leverages broad authorities, partnerships, and operational presence as a system to meet mission responsibilities. Employing our unique blend of military, law enforcement, humanitarian, and regulatory capabilities, we prevent incidents when possible and respond 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	Defense Readiness
	Ports, Waterways, and Coastal Security
	Marine Environmental Protection
	Migrant Interdiction
	Marine Safety
	Aids to Navigation
	Other Law Enforcement

Coast Guard assets and personnel have deployed and operated under the control of DoD commands, conducting major combat operations, providing humanitarian assistance, combating terrorism, and performing other missions. Coast Guard forces give the combatant commanders (CCDRs) capabilities to interact with many regional maritime partners and provide a maritime law enforcement capability in their areas of responsibility.

Coast Guard forces are included in DoD contingency plans in order to mitigate redundancy and sub-optimal use of DoD capabilities resident in the national defense inventory. Use of Coast Guard forces is driven by force readiness, national security requirements, and risk-based decision-making principles. DHS and DoD cooperate under three key memoranda of agreement, which facilitate the following defense operation imperatives:

- Coast Guard inclusion in Maritime Homeland Defense Operations;
- DoD Support to Coast Guard Maritime Security Operations; and
- Coast Guard 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 (RWAI) Operations
    - Combating Terrorism Operations
    - Maritime Operational Threat Response (MOTR) Support.

The USCGR is a flexible, responsive operational force that exists to support the Coast Guard programs of maritime security, defense operations (domestic and expeditionary), and maritime prevention and response. The Coast Guard depends on its Reserve Component (RC) to be always ready to mobilize and respond to incidents with relevant competencies in boat operations, contingency planning and response, expeditionary warfare, marine safety, port security, law enforcement, and mission support.

Port Security Units (PSUs) are a key USCGR capability of the Coast Guard'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 Coastal Riverine Force. The eight Coast Guard PSUs are principally staffed with a RC complement of 137 reservists and are supported by a full-time complement of six Active Component (AC) personnel. Also primarily staffed with reservists, the Coast Guard Mobile Support Unit (MSU) provides expeditionary logistics support capability to USCG capabilities

and resources deployed in support of CCDRs. The MSU is air, sea, and land deployable within 96 hours after mobilization in support of both contingencies abroad and domestic emergencies.

A. Coast Guard Planning Guidance

The Coast Guard 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 Defense 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.[1]

The Coast Guard 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 local response operation. In order to be best prepared to adapt to this rapidly changing operating environment, the USCG has focused on five key strategic plans that represent the most pressing concerns of the Coast Guard. The areas of focus are the result of a risk-informed approach based on our understanding of the strategic landscape:

- Western Hemisphere Strategy: Combating Networks, Securing Borders, and Safeguarding Commerce
- Cyberspace Strategy: Defending Cyberspace, Enabling Operations, and Protecting Infrastructure
- Human Capital Strategy: Meeting the needs of our Mission, Service, and People
- Arctic Strategy: Improving Awareness, Modernizing Governance, and Broadening Partnerships in the Polar Regions
- Maritime Commerce Strategic Outlook: Facilitating lawful trade and travel; Modernizing aids to navigation and mariner information systems; and Transforming workforce capacity and partnerships.

As stated in the Coast Guard Reserve Component Policy Statement, the Coast Guard Reserve serves as the USCG's only dedicated surge force. As such, it is contingency-based to provide ready and responsive personnel to meet mission requirements within the prioritized focus areas of Defense Operations; Ports, Waterways, and Coastal Security (PWCS); Incident Management and Response; and Mission Support. Coast Guard Operational Plans will dictate required competency and capability requirements, which shall be integrated into the Coast Guard Force Planning Construct to shape the size and composition of the current and future workforce.

Predictable and steady funding is critical to the Coast Guard's ability to address these strategic priorities, especially within the RC. Sequestration and Budget Control Act impacts since FY

[1] Admiral Karl l. Schultz, Commandant, U.S. Coast Guard, *Coast Guard Strategic Plan 2018-2019*, Nov 20, 2018, pg 8.

2013 have complicated efforts to reshape the USCGR to address surge mobilization requirements. However, modest increases in funding in FY 2018 and FY 2019 were extremely helpful in stabilizing Reserve resources. Long-term strategic accession and training decisions can help mitigate operational risk across all mission areas requiring RC support now or 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 via procurement procedures using the USCG base budget programmed through the DHS budget.

C. Plan to Fill Equipment Shortages in the RC

In FY 2018, approximately 421 Selected Reserve (SELRES) personnel performed active duty in support of overseas contingency operations, a modest increase compared to FY 2017. In FY 2019 the personnel footprint for planned PSU missions will remain approximately 115 members per deployment (up from the previous level of 75 members in FY 2015) to support an increase in mission requirements at Guantanamo Bay, Cuba. This will accelerate the timeline for recapitalizing personal protective equipment (PPE) while maintaining the current recapitalization rate for boat platforms.

D. Initiatives Affecting RC Equipment

Recent reductions in USCG boat platforms necessitated a more strategic allocation of AC and RC personnel resources to balance mission execution requirements and training availability to support mobilization readiness.

The Boat Forces Reserve Management Plan (BFRMP) has better aligned positions with training capacity, ensuring units with reservists assigned have the type and number of platforms to support the training, certification, and recertification requirements of reservists assigned a boat forces–related mobilization competency.

The initiative clearly defines readiness requirements to ensure reservists are ready and capable to effectively conduct boat operations in support of USCG missions. The implementation phase for BFRMP is nearly complete with full implementation expected during FY 2019.

Approximately 82 percent of the SELRES force is directly assigned to AC units. These 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 BFRMP in particular, established a ratio of reservists to platforms to ensure the effective training of assigned reservists. Additional analysis is needed to determine the appropriate number of platforms that will be required if Coast Guard operational planners determine more reservists with boat forces competencies are needed. The remaining 18 percent of the SELRES force are assigned to USCG Deployable Specialized Forces. The DoD-validated requirements for deployable USCG units in both annually recurring defense operations and 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 our Reserve Forces in the event of an actual contingency. These units include PSUs, Strike Teams, the MSU, and the Navy's Coastal Riverine Force.

II. Coast Guard Reserve Overview

A. Current Status of the Coast Guard Reserve

1. General Overview

Top Coast Guard Reserve Equipping Challenges

- Obtaining sufficient training capacity to ensure proficiency on updated platforms.
- Maximizing availability of operational platforms for RC training.

The Coast Guard 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. Current appropriations may not support the training for a 7,000 member RC that surges across all Coast Guard statutory missions. Any potential gaps in funding will not be definitively known until the Coast Guard is able to restore SELRES end strength to authorized levels. As such, the RC has been described as "contingency based" to meet a more limited set of prioritized mission areas.

As an integrated force multiplier, Reserve personnel serve alongside AC members in support of DHS programs and USCG missions. The USCG depends on the Reserve force to be always ready to mobilize with critical competencies in boat operations, contingency planning and response, expeditionary warfare, marine safety, port security, law enforcement, and mission support. These competencies ensure the Coast Guard Reserve is ready to meet mission requirements across the four prioritized focus areas of Defense Operations; PWCS; Incident Response and Management; and Mission Support.

Between 2015 and 2017, the Coast Guard Reserve established validated capability requirements to best utilize the resources currently available within the RC. These efforts were integrated into the USCG Standard Operational Planning Process/Global Force Management (SOPP/GFM) regime, which provided increased visibility of RC readiness. This was the first time RC capabilities were included in the SOPP/GFM process, providing greater visibility on the personnel capabilities resident in the RC available to meet mission requirements in the event of a Title 10 activation to support contingency operations, or a domestic man-made or natural disaster. This Reserve-specific focus was essential to establishing a baseline from which future workforce allocation decisions could be made. The Coast Guard RC began integrating RC requirements into the wider Coast Guard Force Planning Construct, providing greater visibility on impacts of future budgetary and workforce management decisions.

The RC is comprised of 7,000 funded billets or positions, which is approximately 16 percent of USCG's total force strength. The USCG Reserve Training Appropriation for FY 2018 provided $114.8M 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.

The Reserve Training Appropriation is limited by its inclusion within the Coast Guard's top line budgetary limits set by the Office of Management and Budget and DHS. The Coast Guard Director of Reserve has not been called to provide testimony to Congress during either the confirmation or budget processes in many years. Additional funding is necessary for an increase

to discretionary spending which directly impacts RC enlistment/ retention bonuses and tuition assistance.

In FY 2018, the Coast Guard Vice Commandant directed the chartering of an integrated project team (IPT) to evaluate the organization, policies, and governance of the RC to ensure the most effective and efficient implementation of resources for mission accomplishment. While field integration of AC and RC operations in the 1990s was successful in creating a more efficient field-level and operationally oriented organization, RC governance was not fully integrated at the headquarters level.

2. Status of Equipment

a. Equipment On-Hand

Table 1 Consolidated Major Item Inventory and Requirements, identifies the major equipment inventories for FY 2020–FY 2022. 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).

Coast Guard PSUs operate the TPSB for defense operations, providing waterborne security and port defense operations. The USCG operates a total of 59 Generation IV TPSBs at the PSUs 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 continues recapitalization of its RB-S fleet with production of the 29′ RB-S II. The RB-S II, designed with an increased emphasis on functionality (speed, range, etc.), will gradually replace the Defender-class RB-S fleet as the older assets reach the end of their service life. There are 80 RB-S and 305 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; 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. As new RB-S IIs are delivered from the manufacturer, a one-for-one swap is conducted at the unit with the RB-S coming out of service at the same time the new RB-S II is put into service.

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 2019.

c. Compatibility of Current Equipment with AC

The PSU's primary mission is supporting DoD expeditionary warfare and homeland defense under Title 10 authorities. 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. Their secondary mission is supporting PWCS under Title 14 authorities. Due to their unique mission requirements, TPSBs are maintained mostly at PSUs. However, SMTC maintains four TPSBs used to fulfill training requirements. Additional TPSBs have been purchased solely for the Guantanamo Bay, Cuba, mission. The weapons systems and navigation packages are the same as those found in the AC and 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 anticipates extending the service life of these boats by another 10 years (15-year total service life). Recent improvements to the Depot-level maintenance program include removal of the fuel tank, allowing for a more extensive overhaul. The largest maintenance issue for these boats is the single Machinery Technician at each PSU who is solely responsible for the maintenance of six boats.

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 full integrated logistics support for the RB-S II and TPSB Generation IV boat fleet. A plan for the recapitalization of these assets has not yet been completed. Requirements analysis to identify platform replacement and required funding is expected to begin in the near- to mid-term.

In FY 2014, PSUs completed the full transition from .40 caliber pistols to the 9mm pistol. The USCG contracted to transition from M16A2 rifles to a full complement of M4 variant carbines at the same time. The transition to the M4 carbine was completed in FY 2018. This acquisition

enables PSUs to realize efficiencies through existing DoD supply chains and logistical infrastructure.

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 both 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 ongoing support to operation and maintenance budgets to ensure operability of 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 seven years per platform. Major purchases over the past two fiscal years for equipment such as all terrain forklifts and mobile armories have led to a more standardized, interoperable, and operationally flexible organization. Maintenance funding for all eight PSUs is $1.9 million and critical to sustaining the equipment required for expeditionary operations.

Maximizing the availability of operation platforms for RC training extends beyond concerns with maintenance cycles. The integrated nature of the Coast Guard 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. However, unplanned mission requirements do result in reduced platform availability for training.

B. Changes since the Last NGRER

The Reserve Training Appropriation experienced modest growth in FY 2018 rising to a level of $114.8 million from the $112 million appropriated in FY 2017.

The USCG successfully identified funding to close three of the top eight equipment gaps outlined in the FY 2019 report. Inclusion of the required F550 stake-bed truck, all-terrain forklifts, and searchlight sets have enhanced PSU readiness for deployment. The USCG was also able to reduce the shortage of Tactical Field Lighting sets at the PSUs by half, and of Air Craft Loading Ramps by 33 percent.

The USCG removed all field kitchens from the PSUs following a review of required capabilities. This also resulted in the removal of six positions per PSU previously required to administer the field kitchens.

C. Future Years Program (FY 2020–FY 2022)

1. FY 2021 Equipment Requirements

*Table 1 Consolidated Major Item Inventory and Requirement*s provides projected FY 2020 through FY 2022 inventories and requirements for major equipment. All equipment is procured and accounted for by the AC.

2. Anticipated New Equipment Procurements

The USCG is updating the aging RB-S I fleet with the RB-S II. The 29′ RB-S II is a high-speed platform that handles a wide range of Coast Guard missions close to shore, including search and rescue; law enforcement; PWCS; drug and migrant interdiction; and environmental protection and response. By FY 2019, 100 percent of the RB-S II upgrades will be complete.

3. Anticipated Withdrawals from RC Inventory

The RB-S I fleet will be removed from inventory by the beginning of FY 2020.

4. Remaining Equipment Shortages and Modernization Shortfalls at the End of FY 2022

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 provides PPE for both AC and RC personnel using its operation and maintenance funds. 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 Coast Guard must program $2.966 million for annual budget execution; however, in FY2019 the Service only marked $1.130 million for this purpose (a $1.8 million difference). Funding for Coast Guard PPE has not been indexed with inflation within the base; as a result, buying power is reduced over time. This reflects an internal, risk-based, Coast Guard resource allocation decision which accounts for the use of unallocated funds in other operations and maintenance accounts to reduce PPE gaps over time.

Table 6-2 details the FY 2018 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) are purchased through the use of Overseas Contingency Operations (OCO). Should OCO funding be eliminated, the Coast Guard 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 2019 PPE Funding for the RC

Unit/PPE Type	Cost	# of Personnel	Total	Total/Year
Ashore (Reserve) Basic Ensemble (Boat Station)	$1,780	1,584	$2,819,520	$563,904
Ashore (Reserve) Cold Ensemble (Boat Station)	$1,854	1,044	$1,935,576	$387,115
Ashore (Reserve) Basic Ensemble (Aids to Navigation Team)	$1,780	3	$5,340	$1,068
Ashore (Reserve) Cold Ensemble (Aids to Navigation Team)	$1,854	3	$5,562	$1,112
Sector Ops (Reserve) Basic Ensemble	$1,780	619	$1,101,820	$220,364
Sector Ops (Reserve) Cold Ensemble	$1,854	425	$787,950	$157,590
Tactical (Reserve) Basic/Cold Ensemble (PSU)	$3,634	320	$1,162,880	$232,576
PSU Ballistic Protection Systems	$4,400	1096	$4,822,400	$964,480
PSU MOPP 4	$2,000	1096	$2,192,000	$438,400
PPE per Person Total		5,094	$14,833,048	$2,966,609
Total	$14,818,048			
Total/Year	$2,966,609		Annual Shortfall	
Total Available	$1,130,588		($1,836,021)	

All members of the Coast Guard 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 Coast Guard Reserve 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 USCGR to successfully augment the AC.

The USCGR 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 in responding to various contingencies and fulfilling the security demands of the nation.

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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 2019 unit cost estimates are provided by the Military Departments.

Nomenclature	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Port Security Units (PSU)						
AN/PRC-117G Wideband, Multiband, Multi-mission Tactical Boat Radio	$18,750	55	55	55	55	55
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	956	956	956
SIG P229R DAK 9mm Pistol	$660	540	540	540	540	540
Deployable Medical Officer Kits	$111,000	4	4	4	4	8
Portable Armory	$75,000	8	8	8	8	8
Portable loading ramps	$14,780	15	15	15	15	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	55	55	55	55	55
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
Vehicle, 15 PAX Van (1 per unit)	$45,000	8	8	8	8	8
Generators with Distribution Panel	$44,000	24	24	24	24	24
32' Transportable Port Security Boat (TPSB)	$495,000	55	55	55	55	55
Utility Trailer (1 per unit)	$7,000	8	8	8	8	8
Searchlight Set	$7,700	8	8	8	8	8
Tactical Lighting Field Kits	$5,100	8	8	16	16	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
Vidmar, Storage Container	$3,246	32	32	32	32	88
Unity Triband Radio	$5,000	110	110	110	110	110
Base X Shelter (6D31)	$86,428	95	95	95	95	112
Water Bladder, 2K-gallon capacity	$8,776	8	8	8	8	8
Palm Infrared, Thermal Imager	$9,450	0	0	0	0	16
USCG Boat Forces						
Response Boat-Small II (RB-S II)	$400,000	342	352	352	352	352

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Table 1

Consolidated Major Item Inventory and Requirements

Nomenclature	Unit Cost	Begin FY 2020 QTY O/H	Begin FY 2021 QTY O/H	Begin FY 2022 QTY O/H	End FY 2022 QTY O/H	End FY 2022 QTY REQ
Mobile Support Units (MSU)						
Trailers, Tools / Equipment	$150,000	1	1	1	1	1
Truck, Stake-bed Class 8	$126,000	2	2	2	2	2
Truck, Stake-bed	$65,000	2	2	2	2	2
Generator, 240kW	$120,000	4	4	4	4	4
Forklift, 10,000 lb	$90,000	1	1	1	1	1
Trailer, Administrative Support	$86,463	2	2	2	2	2
Trailer, Maintenance Shop	$83,688	7	7	7	7	7
Trailer, Logistic Support Parts	$58,462	6	6	6	6	6
Trailer, Open Bulk Storage	$49,600	4	4	4	4	4
Truck, Pickup	$45,000	2	2	2	2	2
A/C - H/P	$10,000	4	4	4	4	4
Portable Welding/Cutting Shops	$30,000	2	2	2	2	2
Generator, Magnum 25kW	$10,000	4	4	4	4	4
CONEX Boxes, 40' X 8'	$30,000	2	2	2	2	2
CONEX Boxes, 20' X 8'	$12,000	8	8	8	8	8
CONEX Boxes, 8' X 8'	$15,000	2	2	2	2	2
Power Distribution Center	$12,000	4	4	4	4	4
Air Craft Loading Ramp sets	$15,000	2	2	2	2	2
AC&R Repair and Service Kits	$10,000	2	2	2	2	2
DC Kit, Compressed Air & GenSet	$8,000	2	2	2	2	2
Computer, Laptop	$2,000	2	4	4	4	4
Gator, 6X6 Diesel Terrain Vehicle	$6,500	3	3	3	3	3
Generator, Light Tower	$5,716	5	5	5	5	5
Generator, Microsilent 12kW	$3,500	4	4	4	4	4
Base X Shelter (6D31) Command	$27,966	1	1	1	1	1
Base X Shelter (505) Maintenance	$24,190	1	1	1	1	1
Drash Shelter (6S)	$18,300	5	5	5	5	5
Drash Shelter (2S)	$9,200	6	6	6	6	6
Environmental Control Unit (ECU), Drash	$92,131	1	1	1	1	2
Diesel Powered Welder	$3,000	1	1	1	1	1
Special Missions Training Center (SMTC)						
32' Transportable Port Security Boat	$495,000	4	4	4	4	4
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	1	1	1	1	1
* The AC manages all equipment for the Coast Guard Total Force.						

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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 2019.

Nomenclature	Average Age	Remarks
Port Security Units (PSU)		
32' Transportable Port Security Boat (TPSB)	7	
Radio Set AN/PRC-117G	5	
AN/PRC-152A Wideband, Handheld, Networking Radio	7	
Unity Triband Radio	3	
Portable Armory	6	
All Terrain Forklift	4	
All Terrain Vehicle, Gator (1 per unit)	5	
Vehicle, F550 Stake-bed (1 per unit)	7	
Vehicle, F450 Pickup (5 per unit)	7	
Vehicle, 15 PAX Van (GSA Leased, non-deployable)	4	
Generator 125kW with distro panel (3 per unit)	7	
Generator, Signal Synthesizer, Frequency, MG3641N (500 KHz to 1024 MHz AM/FM)	10	
Utility Trailer (1 per unit)	14	
Counter, Frequency (DC to 500HHZCW)	15	
Analyzer, Communication	13	
Fuel Bladder 3K Gallon	12	
Fuel Containment Boom	7	
Tents	7	
Tactical Lighting Field Kits	9	
Aircraft loading ramps	11	
Water Buffalo (1 per unit)	3	
Base X Shelters (14 per PSU)	7	
USCG Boat Forces		
Response Boat Small II (RB-S II)	3	
Mobile Support Units (MSU)		
Truck, Stake-bed Class 8	7	
Truck, Stake-bed	15	
Truck, Pickup	14	
Gator, 6X6 Diesel Terrain Vehicle	9	
Generator, 240kW	12	
Generator, Light Tower	12	
Generator, Magnum 25kW	12	
Generator, Microsilent 12kW	15	
Forklift, 10,000 lb	14	
Trailers, Tools / Equipment	11	
Trailer, Administrative Support	10	
Trailer, Logistic Support Parts	10	
Trailer, Maintenance Shop	10	

USCGR
Average Age of Equipment

Table 2

Nomenclature	Average Age	Remarks
Trailer, Open Bulk Storage	10	
Computer, Laptop	2	
A/C - H/P (Air Rover Units)	12	
Portable Welding/Cutting Shops	12	
CONEX Boxes, 40' X 8'	19	
CONEX Boxes, 20' X 8'	6	
CONEX Boxes, 8' X 8'	14	
Power Distribution Center	5	
AC&R Repair and Service Kits	9	
DC Kit, Compressed Air & GenSet	10	
Diesel Powered Welder	10	
Environmental Control Unit (ECU), HP4-DL	13	
Base X Shelter (6D31) Command	13	
Base X Shelter (505) Maintenance	13	
Drash Shelter (6S)	13	
Drash Shelter (2S)	13	
Air Craft Loading Ramp sets	1	
Special Missions Training Center (SMTC)		
32' Transportable Port Security Boat (TPSB)	5	
Environmental Control Unit (ECU), HP-2C/338 IPT	4	
Base X Shelter (6D31)	9	
Base X Shelter (505)	9	
Base X Shelter (307)	9	
Base X Shelter (305)	9	
Base X Shelter (203)	9	
Trailer, Tank	15	
ISU 90 Shipping Container	8	

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 2020 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 2020 are expected to arrive in RC inventories in FY 2021 or FY 2022.

Nomenclature	FY 2020	FY 2021	FY 2022

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 2019 would be expected to arrive in RC inventories in FY 2020 or FY 2021. All values are costs in dollars.

Nomenclature	FY 2017	FY 2018	FY 2019

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 2020 Qty	FY 2021 Qty	FY 2022 Qty	Remarks

Service has no planned transfers or withdrawals for the years FY 2020 thru FY 2022.

USCGR

Table 6

FY 2015 Planned vs Actual Procurements and Transfers

NOTE: This table compares planned Service procurements and transfers to the RC in FY 2016 with actual procurements and transfers. FY 2016 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 2016 Transfers (# of items)		FY 2016 Procurements ($s)		FY 2016 NGREA ($s)	
		Plan	Actual	Plan	Actual	Plan	Actual

USCGR had no planned or actual transfers or procurements of major equipment during FY 2016.

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 2020 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 six prioritized (PR) shortage list for major equipment items required for wartime missions but which are currently not funded in the FYDP. It lists the total quantity required, the total unfunded requirement, the individual item cost, and the cost of the unfunded portion. This data is consistent with other unfunded equipment data submitted by the Service.

PR	Nomenclature	Total Req'd	# Items[1] Short	Item Cost	Total Shortage Cost	Rationale/Justification
1	Deployable Medical Officer Kits	8	6	$111,000	$666,000	The medical officer kit allows PSUs to maintain self sustainability in a vulnerable joint security area where medical transportation for treatment by a Coast Guard medical officer incurs additional safety and security risks.
2	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).
3	Base X Field Tents	112	17	$86,428	$1,469,276	Required by PSUs for tactical Safety and Security; PSU 311 requires 14 Base X units; PSU 307 requires 3.
4	Tactical Field Lighting Sets	16	8	$5,100	$40,800	2 sets required by each PSU for tactical Safety and Security
5	Air Craft Loading Ramps	24	9	$14,780	$133,020	3 sets required by each PSU for air/sea/rail mobility and adherence to USAF requirements.
6	Environmental Control Unit (ECU)	2	1	$92,131	$92,131	The Environmental Control Unit (ECU) is critical to supporting environmental controls within tents used to support unit deployments.

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 redesignated 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. §§ 331–333), 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 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 2019–FY 2021 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 2019–FY 2021
  - remaining shortfall for FY 2021 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 2016 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 2019 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 2020, 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 2019.

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 three years, this table highlights those 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 three-year period, many Services do not know exact quantities of transfers or withdrawals until year of execution due to the uncertainty of the procurement/delivery cycle of new equipment.

Table 6: FY 2015 Planned vs Actual Procurements and Transfers. This table compares what the Service planned to procure and transfer to the RC in FY 2015 with actual procurements and transfers. Since the procurement cycle is normally one to three years from funding to delivery, this table identifies only what has been delivered through the end of FY 2017.

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 2020–FY 2022 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 DoD response to the requirement, in accordance with section 10541(b)(9) of title 10, United States Code (U.S.C.), for an assessment of the extent of to which the National Guard possesses equipment necessary to perform certain specified federal missions in response to an emergency or major disaster in the United States (Section I,) and the requirement, in accordance with section 10541(d) of title 10, U.S.C., to provide a statement of accuracy on projections and a certification by the Chief of the National Guard regarding National Guard equipment (Section II).

Figure B-1, Chief, National Guard Bureau Memorandum

NATIONAL GUARD BUREAU
1636 DEFENSE PENTAGON
WASHINGTON, DC 20301-1636

JAN 18 2019

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, "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 2020 National Guard and Reserve Equipment Report, in accordance with subsection (d) of reference.

We are furthering efforts to improve capabilities to certify the accuracy of inventory projections. The Air National Guard continues to explore processes for incorporating a certification capability within the Defense Property Accounting System. The Army National Guard continues to focus on posturing itself within the Army's Sustainable Readiness Model. However, at this time, I am unable to determine the accuracy of projected inventories as prescribed in the reference.

I do not expect to achieve full transparency and traceability of procurement funding desired by Congress until implementation of specific Reserve Component Budget Line Item Numbers or something similar. Without this level of financial transparency, I am not able to definitively certify, as per the reference, the procurement or receipt of expected items for which funds were appropriated.

I support the 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 funding identified by Congress for the National Guard procures equipment for the National Guard. Any resolution must fulfill Congressional desire for increased transparency while maintaining the Military Services' flexibility, within reprogramming thresholds established by Congress, to address changing priorities.

The point of contact for this action is Colonel Denise W. Boyer, National Guard Bureau Logistics and Engineering, at 703-607-1082.

Joseph L. Lengyel
General, USAF
Chief, National Guard Bureau

I. National Guard Overview

"As Chief of the National Guard Bureau, my focus every day is accomplishing our three core missions—fighting America's wars, securing the homeland, and building enduring partnerships. This past year, our Guardsmen and women performed these missions magnificently and I could not be more proud of their commitment and dedication.

As the new National Defense Strategy acknowledges, we live in an increasingly complex global security environment where the character of war is changing. We are no longer safe at home as the current threat environment blurs the lines between domestic and overseas threats, with many of these threats transcending regions and domains of warfare. We must compete globally, across the engagement spectrum. We must build a more modern, lethal, agile and resilient force to respond to these challenges and the increasing volatility of our security environment. Maintaining an operational National Guard, as a part of the joint force, is critical to this end."[1]

In building a more lethal Joint Force as directed by the National Defense Strategy, the National Guard must ensure readiness. Readiness begins with our force structure and the Guard must have a balanced array of combat and enabling forces that largely mirrors the Army and the Air Force. Readiness also includes resourcing the National Guard through appropriate levels of full-time support, modernization, and recapitalization of equipment, replacing and upgrading Guard facilities, and recruiting and retaining the best men and women to enhance the readiness of our force. Investment in high-level collective training opportunities such as Combat Training Center rotations and Red Flag exercises builds the readiness of the National Guard, develops leaders, preserves readiness in the active components for contingency operations, and supports critical joint force requirements. Increased combat readiness also enhances our ability to respond quickly and effectively, saving lives and property in the homeland.[2]

National Guard Bureau (NGB) readiness also includes plans to replace and upgrade obsolete or aging National Guard facilities and warfighting equipment. Ensuring proper training facilities and the latest equipment allows for realistic training and greatly enhances the readiness of our forces.[3] The NGB must also invest in innovation in high-priority mission sets such as Intelligence, Surveillance, and Reconnaissance and Remotely Piloted Aircraft to maintain our competitive advantage against evolving threats.[4] Essential to achieving these readiness objectives is predictable and dependable investment by the Services and Congress.

> "With this investment, our interoperability with the joint force will continue to deepen and evolve as we prepare to confront future threats–threats that are now global, emanate from all domains, and are adaptable and multi-functional in their forms. Only a well-integrated and well- trained force will keep our nation safe and secure our national interests."[5]

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[1] Written Statement of GEN Joseph L. Lengyel, Chief, National Guard Bureau, before the Senate Appropriations Committee, Subcommittee on Defense, April 17, 2018, p. 2.
[2] *2015 National Guard Posture Statement*, p. 7.
[3] *2018 National Guard Bureau Posture Statement*, p. 7.
[4] Written Statement of GEN Joseph L. Lengyel, Chief, National Guard Bureau, before the Senate Appropriations Committee, Subcommittee on Defense, April 26, 2017, p. 10.
[5] *2018 National Guard Bureau Posture Statement*, p. 4.

A. National Guard Readiness for Emergencies and Major Disasters in the United States

Army and Air National Guard units are designed for combat. Our units and wings have the structure, equipment, and training to function independently anywhere in the world. The combat skills and equipment that enable a brigade combat team or flying squadron to mobilize and succeed in Afghanistan also enable them to respond to a natural disaster in the United States.

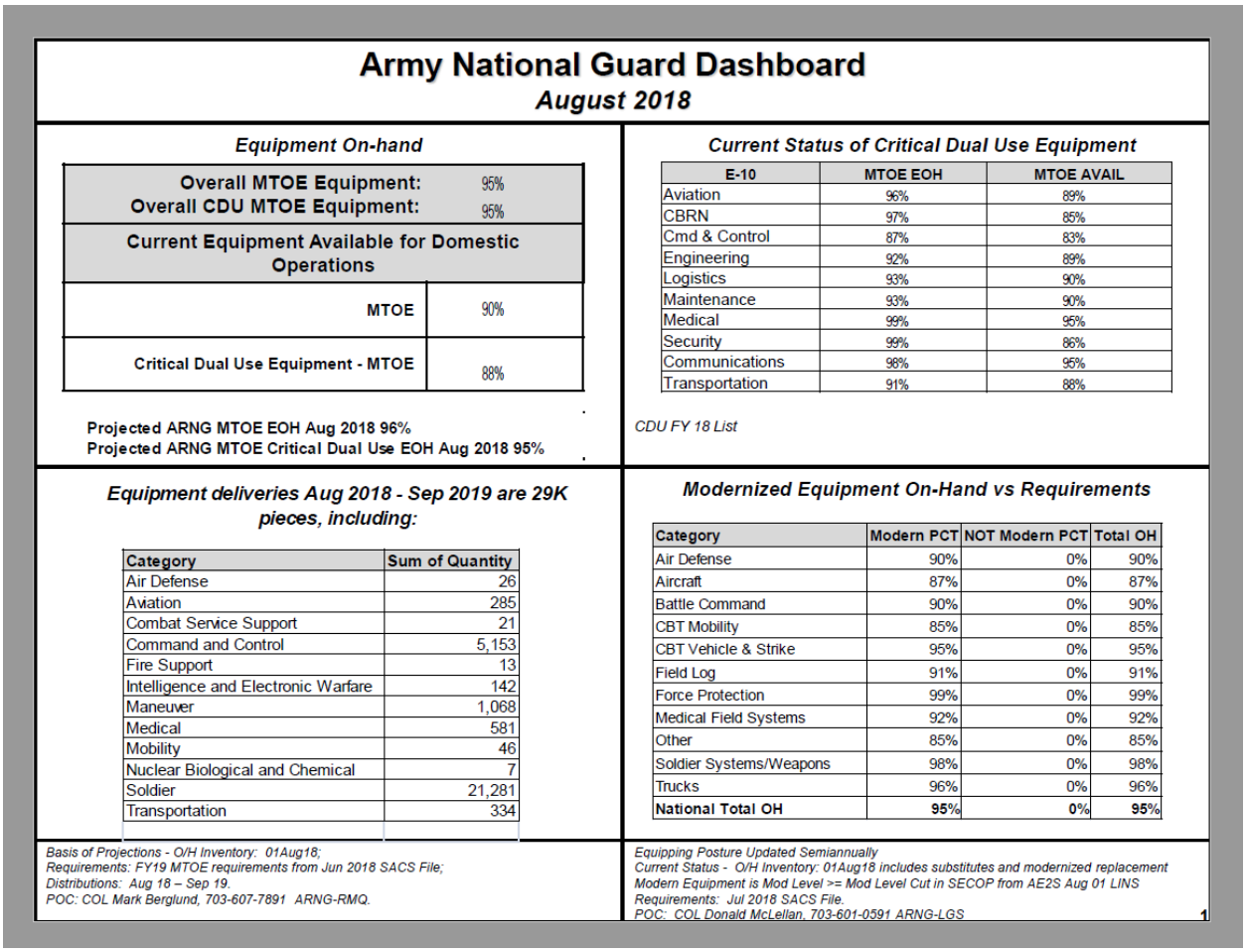
From trucks and airplanes to radios and medical tents, our resources are ready for conflict overseas and missions here at home. No other force in the nation is able to rapidly provide military equipment and capabilities during a domestic emergency like the National Guard. The vast majority of our equipment is available for state governors to use to save lives and property when not supporting federal missions.[6]

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 2018 through September 2019, and EOH of Modernized versus Not Modern equipment. As of August 2018, the ARNG EOH for Modified Table of Organization (MTOE) required equipment stood at 95 percent and at 95 percent for MTOE CDU equipment. Further breakdown of overall MTOE EOH and CDU EOH is provided for equipment available for Domestic Operations (available to the governor), with MTOE EOH at 90 percent and CDU EOH at 88 percent. Equipment not available to the governor is primarily a result of Title 10 mobilizations. EOH percentages fluctuate year to year due to force structure changes but should be minimal due to aggregation of EOH at the state and national levels. Year to year CDU percentage variations are primarily due to changes in the CDU list of equipment.

[6] *2015 National Guard Posture Statement*, p. 32.

Figure B-2. Army National Guard Dashboard, August 2018



Army National Guard Dashboard
August 2018

Equipment On-hand

Overall MTOE Equipment:	95%
Overall CDU MTOE Equipment:	95%
Current Equipment Available for Domestic Operations	
MTOE	90%
Critical Dual Use Equipment - MTOE	88%

Projected ARNG MTOE EOH Aug 2018 96%
Projected ARNG MTOE Critical Dual Use EOH Aug 2018 95%

Current Status of Critical Dual Use Equipment

E-10	MTOE EOH	MTOE AVAIL
Aviation	96%	89%
CBRN	97%	85%
Cmd & Control	87%	83%
Engineering	92%	89%
Logistics	93%	90%
Maintenance	93%	90%
Medical	99%	95%
Security	99%	86%
Communications	98%	95%
Transportation	91%	88%

CDU FY 18 List

Equipment deliveries Aug 2018 - Sep 2019 are 29K pieces, including:

Category	Sum of Quantity
Air Defense	26
Aviation	285
Combat Service Support	21
Command and Control	5,153
Fire Support	13
Intelligence and Electronic Warfare	142
Maneuver	1,068
Medical	581
Mobility	46
Nuclear Biological and Chemical	7
Soldier	21,281
Transportation	334

Basis of Projections - O/H Inventory: 01Aug18;
Requirements: FY19 MTOE requirements from Jun 2018 SACS File;
Distributions: Aug 18 – Sep 19.
POC: COL Mark Berglund, 703-607-7891 ARNG-RMQ.

Modernized Equipment On-Hand vs Requirements

Category	Modern PCT	NOT Modern PCT	Total OH
Air Defense	90%	0%	90%
Aircraft	87%	0%	87%
Battle Command	90%	0%	90%
CBT Mobility	85%	0%	85%
CBT Vehicle & Strike	95%	0%	95%
Field Log	91%	0%	91%
Force Protection	99%	0%	99%
Medical Field Systems	92%	0%	92%
Other	85%	0%	85%
Soldier Systems/Weapons	98%	0%	98%
Trucks	96%	0%	96%
National Total OH	**95%**	**0%**	**95%**

Equipping Posture Updated Semiannually
Current Status - O/H Inventory: 01Aug18 includes substitutes and modernized replacement Modern Equipment is Mod Level >= Mod Level Cut in SECOP from AE2S Aug 01 LINS
Requirements: Jul 2018 SACS File.
POC: COL Donald McLellan, 703-601-0591 ARNG-LGS

1

The Army recognizes the need to track Modernized Equipment On-Hand (MEOH). MEOH is used to measure the Army's modernization progress and shows modern inventory against requirements, excluding older substitutes. ARNG August MEOH is 95 percent when redistributing excess modernized equipment first at Modernization Level 3 or higher to replace older, obsolete equipment in the force pool. The MEOH allows the Army to measure the equipment modernization of the force at the aggregate and component levels.

The current status of Critical Dual Use (CDU) Equipment table provided in the ARNG Dashboard (see *Figure B-2*) identifies those capabilities required by the ARNG for filling equipment shortfalls in support of both federal and domestic missions. The Dashboard CDU list includes equipment on which ARNG focuses its efforts to fill and to improve on modernization. The table identifies ARNG areas that should be given additional special attention. Specific CDU areas of most concern include Chemical, Biological, Radiological, Nuclear (CBRN), Engineering, and Logistics and Transportation.

1. Army National Guard Equipment Shortfalls

Total Army modernization efforts significantly increased ARNG MEOH, bringing the ARNG closer to parity with the Active army. Maintaining compatibility and interoperability is critical to

Readiness and the Director, Army National Guard's strategic vision. Likewise, the "right mix" of unit capabilities combined with modern equipment is essential to conducting both the ARNG's federal and domestic missions. The ARNG is the nation's chief first military responder for domestic operations and homeland defense. Key to the ARNG's domestic response success is the reduction of all Critical Dual-Use (CDU) equipment shortfalls that impact the ARNG's capability to respond to disasters and emergencies; Aviation, Command and Control (C2), Engineering, and Communications.

a. Aviation

ARNG Aviation provides a critical capability for domestic and Emergency Management first responders. ARNG rotary-wing capabilities are called upon to fight wildfires and to provide patient movement to support hurricane response, and are key to enabling responders' movements in the early aftermath of natural and manmade disasters. The Army's planned replacement of ARNG A-model Blackhawk helicopters with L and M models by FY 2023 or sooner, has not changed. ARNG UH-60A Blackhawk divestment is scheduled for FY 2024, with M-model Blackhawk FUE forecast for late 2025 and V-models to start no earlier than FY 2027. The 201 shortfalls (75 percent equipped with Ravens leaves multiple units unable to adequately train and does not truly express the shortage due to the Ravens' high breakage rate.

b. CBRN

The National Guard CBRN Response Enterprise (CRE) force elements consist of the Weapons of Mass Destruction Civil Support Teams (WMD-CSTs), Homeland Response Forces (HRFs), and CBRNE Enhanced Response Force Packages (CERFPs). The CRE provide defense support of civil authorities (DSCA) during major or CBRN-related incidents. During POM 20-24 the Army identified the Unified Command Suite (UCS) modernization program as a bill payer and eliminated the funding completely by $98.1 million. The elimination of UCS Modernization funding will create a capability gap that will hinder the performance of their Congressionally-directed mission, as codified in U.S.C. 10 § 12310.

c. Command and Control (C2)

The ARNG continues to improve C2 system modernization and readiness, but concerns about future fielding rates of modernization still exist. Any reductions in C2 system funding for ARNG will negatively impact 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 keeping pace with modernization.

d. Engineering

Engineering equipment provides a versatile and affordable emergency response capability in support of defense support of civil authorities (DSCA) missions. The majority of the total Army engineer force structure resides in the ARNG and is often deployed outside the continental United States for other missions. The engineering portfolio shows significant shortages in Hydraulic Excavators, which are used to support debris reduction and rebuilding operations after domestic disasters. M1977A4 Transporter Common Bridge was designed to support the Engineer Corps in transporting all bridging assets and the new Hydraulic, Electric, Pneumatic, Petroleum Operated Equipment (HEPPOE) replacing the Hydraulic, Electric, Tool Outfit and the Pneumatic

Tool Compressor Outfit. A new power plant utilizes both systems in one unit. The HEPPOE also comes with multiple tool crates containing everything from jackhammers and pneumatic picket pounders to a hydraulic chainsaw.

e. Communications

The ARNG is continuing to transition the ARNG Joint Incident Site Communications Capability (JISCC) to the Disaster Incident Response Communications Terminal (DIRECT) Program of Record to replace the current Joint Incident Site Communication Capability (JISCC) Block 2. The capability enables a Joint Network Node (JNN)/Satellite Transportable Terminal (STT) to provide a dual use for identified DSCA mission requirements and provides communication to each of the 50 states and 4 territories. DIRECT meets the information exchanged requirements of the States' National Guard operational commanders while performing DSCA missions. DIRECT displays 24 of 58 (41 percent) requirements that would be fielded to all states and territories. Currently DIRECT will be fielded to 11 states (11 systems) in FY 2019, bringing the total to 34. These totals do not reflect 10 DIRECT Systems that were bought through National Guard and Reserve Equipment Appropriation (NGREA).

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 potential modernization does not occur. When resources are reduced and equipment production and deliveries are delayed, the trickle-down effect impacts training and ultimately our soldiers' abilities to execute their missions to their fullest potential.

Any shortfalls in command and 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 (EOC), and soldiers in the field. As of September 1, 2018, the ARNG had provided critical infrastructure protection, support to civil authorities, and disaster relief 229 times, including 2,885 Civil Support Team (CST) response missions. The range and complexity of these missions reflect the importance of C3 capabilities and the need for keeping pace with technological improvements and modernization requirements.

Although the ARNG is currently 95 percent EOH for CDU equipment (including substitutes, significant shortages in critical capabilities such as the HERCULES, Joints Effects Targeting Systems (JETS), Multi-role Anti-Armor Anti-Personnel Weapon System (MAAWS) and the Semitrailer: Flatbed 340 ton), the estimated cost to fill the shortfalls either by procurement or modernizing is $982.9 million. Without procurement or modernization of these capabilities, the ARNG must respond to domestic emergencies with less modern or legacy equipment. As a result, shortages in these capabilities will remain, leave multiple engineer units to rely on smaller, less effective equipment, potentially resulting in contracted civilian equipment being used to support mission requirements.

3. Army National Guard Investment Strategies

ARNG Equipment modernization funding is accomplished through Headquarters, Department of the Army's (HQDA's) Program Objective Memorandum (POM) and equipment is procured through Army procurement and sustainment accounts. Delays in modernization will create

compatibility, interoperability, and capability challenges. The ARNG will continue to use authorized substitution and legacy equipment (although capable) to meet mission requirements in support of domestic operations and combatant commanders. However, this will require significant increases in sustainment funding to maintain aging equipment.

In order to mitigate the risk to CDU equipment and domestic response readiness, the National Guard invests through NGREA for modernization of key CDU equipment, critical Essential 10 equipment capabilities, and training simulation. The ARNG received $429 million in NGREA for FY 2018 that included requests from the ARNG for 32 CDU capabilities but are not on the Army's list of CDU equipment. 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

Readiness is the top priority for the Director of the Air National Guard. Lieutenant General L. Scott Rice stated before the House Armed Services Committee, "Readiness is measured in two ways: 'for what: the commander's assessment of whether the unit is ready to support their mission' and 'with what: measures personnel, training, skill level, equipment, and resources'."[7] With this priority in mind, the Air National Guard will continue to pursue modernization and replacement of its equipment in order to provide a more lethal combat force and improve readiness for both the federal and the state mission requirements. In the past year, the National Guard responded to Hurricanes Irma, Harvey, and Maria where a total of approximately 45,000 Guardsmen and women supported recovery operations. Simultaneously, the National Guard supported wildland firefighting efforts across several states. The nation had to galvanize its efforts and resources to provide resiliency and stability to the communities affected by these disasters.[8] Yet, critical capability gaps remain for our non-federalized homeland response forces that support national Emergency Support Functions. Modernization and recapitalization of ANG support equipment and vehicles to meet both national defense and domestic operations requirements is our primary focus (see *Table B-1*.)

[7] Lt Gen L. Scott Rice, Statement to House Armed Services Committee, March 22, 2017.
[8] Written statement of Gen Joseph L. Lengyel, Chief, National Guard Bureau, before the Senate Appropriations Committee, Subcommittee on Defense, April 17, 2018, p. 5.

Table B-1. ANG Equipment and Vehicles

July 2018							
Capability	**Auth Qty**	**In use Qty**	**Fill Rate**	**Authorized Cost**	**In Use Cost**	**Needed Qty**	**Needed Cost**
Aviation SE	43,288	40,731	**94%**	$445,412,452	$443,559,686	2,557	$1,852,766
Civil Support & Force Protection	5,707	5,682	**100%**	$4,035,030	$3,736,873	25	$298,157
Command & Control	14,255	14,099	**99%**	$480,007,662	$470,224,372	156	$9,783,290
Communication	13,448	12,369	**92%**	$170,021,596	$168,796,040	1,079	$1,225,556
Engineering	26,587	26,109	**98%**	$291,497,594	$248,430,923	478	$43,066,671
Logistics	90,031	72,040	**80%**	$116,081,819	$95,718,893	17,991	$20,362,926
Maintenance	94,408	89,084	**94%**	$2,585,680,106	$2,153,445,707	5,324	$432,234,399
Medical	23,657	23,654	**100%**	$72,997,019	$72,886,626	3	$110,393
Security	55,828	52,307	**94%**	$109,674,741	$96,768,011	3,521	$12,906,730
Total Equipment	**367,209**	**336,075**	**92%**	**$4,275,408,019**	**$3,753,567,131**	**31,134**	**$521,840,888**
Vehicles	15,229	14,101	**93%**	$1,287,202,225	$1,273,340,363	1,128	$13,861,862
Total Equipment & Vehicles	**382,066**	**349,413**	**91%**	**$5,562,610,244**	**$5,026,907,494**	**32,653**	$535,702,750

Approximately 2.3 percent of ANG equipment is currently deployed in support of overseas contingencies. These assets must be replaced or modernized in order to provide the states a domestic response capability when the items return from overseas support to federal missions.

D. ANG Equipment Shortfalls

A more detailed review of the ANG equipment health is described identified in *Table B-1*.

1. CBRN

The National Guard CBRN Enhanced Response Force Package (CERFP), Homeland Response Force (HRF), and Expeditionary Medical Support (EMEDS) medical elements need to upgrade their advanced trauma medical equipment. Requirements for specialized equipment, such as video laryngoscopes, defibrillators, bariatric litters, medical rapid response equipment, and infection control/prevention containment systems, have been validated through the Domestic Capability Priority, and are awaiting final NGREA funding approval. FY 2018 and FY2019 NGREA is planned for the procurement of CBRN robots, oxygen generation, and other medical support equipment.

2. Command and Control (C2)

ANG C2 organizations require systems upgrades in Air Operations Centers, Battle Control Centers as well as Control and Reporting Centers to meet combatant command requirements. C2

organizations operate with outdated equipment and software that is not on par with current technology, creating several operational limiting factors. FY 2017, FY 2018, and FY 2019 funding is planned for the procurement of critical upgrades to AOC, BCC, and CRC systems.

3. Communications

No significant changes from prior submission. ANG communications forces have required communications for assigned missions, but previously identified gaps exist for domestic operations. Military emergency response forces are often unable to conduct interoperable communications with their civilian emergency response forces when utilizing military-issued tactical radios. In addition, military C2 centers are not able to track their response personnel who have deployed into an affected area of operations. These military responders include personnel from capabilities such as Firefighter and Emergency Services, Security Forces, Explosive Ordnance Disposal, HRF, CERFPs, and the C2 elements responsible for tracking responding forces. In support of HRF and CERFP operations, the ANG's Joint Incident Site Communications Capability (JISCC) Block 3 asset provides HRF/CERFP C2 units with tactical reach-back and incident-area voice and data communications services, including interoperability with and reach-back transport of data from the National Guard CRE Information Management System (NG CIMS) that is utilized by HRF and CERFP units. However, during the critical initial response phases of an event, and while waiting for the more robust ANG JISCC Block 3 and Mobile Emergency Operations Centers (MEOC) assets to be deployed to the incident location, military first responders require the ability to conduct voice communications with civilian and government partners. Needed radios must be able to interoperate with civil networks and be compliant with Association of Public-Safety Communications Officials International Project 25 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 will allow communications on common military and civilian VHF/UHF, AM/FM civil bands and grant automatic, instant connectivity among personnel entering the operational area. The encryption would provide state-of-the-art security when required. This effort is in line with the March 30, 2011, Presidential Policy Directive 8: National Preparedness, which is aimed at facilitating an integrated, all-of-nation, capabilities-based approach to preparedness. Without these highly capable and interoperable radios, responders risk mission degradation or failure during domestic disaster response operations. FY 2017, FY 2018, and FY 2019 NGREA will be used to upgrade communication systems for a number of ANG programs.

4. Engineering

Shortages in firefighting, Urban Search and Rescue (US&R), Explosive Ordnance Disposal (EOD) equipment, water production kits, and Chemical, Biological, Radiological, Nuclear (CBRN) detection and support equipment continue to inhibit the ANG's ability to perform home station and overseas deployments, or provide support to civil authorities. FY 2017, FY 2018, and FY 2019 NGREA is planned for use in upgrading EOD, CBRN, US&R, and firefighting bunker gear plus equipment.

5. Logistics

The ANG's logistics function operations rely on outdated equipment and vehicles that have exceeded their lifecycle effectiveness and efficiency. These items enable those capabilities necessary for the delivery of supplies, equipment, services, and personnel to support federal

missions and domestic operations. Through the centralized management of the supply chain functions in support of local, state, and federal governments, the logistics functional area coordinates sources of supply, acquisition, delivery of supplies, equipment and services. FY 2018 and FY 2019 NGREA is planned for upgrading Security Forces, Mobile Emergency Operations Center (MEOC), and Space Control vehicles and equipment.

6. Medical

No significant changes from prior submission. 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. The current defibrillators on GA teams are outdated. They were designed for combat situations and are not adaptable for use with a variety of patient types, such as the elderly or children. Newer models of defibrillators are more portable, more adaptable for use on a wide variety of people, and are Wi-Fi-enabled to provide continuity of care and expanded functionality. This upgraded capability would be focused at the four ANG rescue units located in New York, Alaska, Kentucky, and California. The current National Guard patient movement and tracking system has reached the end of its expected lifecycle and needs to be replaced. DoD solutions are currently in development, but are not projected to be available for 7 to 10 years. The National Guard is working to generate a patient/evacuee tracking system which will support both state and local tracking requirements and interagency tracking requirements, and is working with DoD and interagency partners to develop and source this system. FY 2017, FY 2018, and FY 2019 NGREA is planned for the procurement of oxygen generation, airway management, Guardian Angel, patient tracking, and other medical support equipment.

7. Security

The ANG is actively filling Security Forces (SF) equipment shortfalls utilizing NGREA funds. Security Forces face an extremely high operations tempo with air expeditionary force deployments and missions in support of civil authorities. We have been partially successful in modernization of our vehicle fleet, increasing our reliable response to local and civil emergencies. Furthermore, the ANG has procured or is in the process of procuring eight total modular ranges as a temporary solution to military construction, enhancing the readiness of all ANG forces. The ANG's shortage of available ranges to conduct small arms qualification training degrades operational readiness for SF and Civil Engineers specifically, and for all ANG personnel preparing for deployment. SF personnel have also identified additional equipment requirements that include, Law Enforcement Ensemble Kits (LEEK), Interoperable Radios, Use of Force Simulators, and armor/helmet modernization that will enable SF Squadrons to provide mission ready Defenders. FY 2018 and FY 2019 NGREA is planned for upgrading SF vehicles and equipment.

8. Transportation

The ANG vehicle overall fill rate remains at 90 percent, but fill rates do not address significant issues associated with the ANG Vehicle Fleet health rate. The ANG is woefully below the Air Force standard in almost every category of vehicle when it comes to vehicle fleet health rates. Consistently underfunding the vehicle procurement requirement has led to deterioration of the ANG vehicle fleet, increased the hours of labor required to maintain older vehicles, and

increased vehicle down times. At this time, the ANG is failing to meet Air Force Common Output Level Standards 2 standard (80 percent Fleet health rates) towards service healthcare delivery. 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*).

Table B-2. ANG Vehicle Fleet Health Rates: August 2018

Category	Health Rate	Effective Age	Bow Wave	Fill Rate	Vehicle Age
Passenger Carrying	79.50%	8.35	6,284,177.00	84.90%	8.80
Medium Tactical	60.90%	15.78	76,843,933.00	84.20%	15.31
Cargo Utility	69.30%	12.86	80,010,947.00	91.40%	13.11
Joint Light Tactical Vehicle	78.50%	12.91	53,250,000.00	84.70%	11.63
Security Tactical	66.10%	15.50	5,702,162.00	87.70%	14.91
Special Purpose	75.20%	15.16	79,562,053.00	94.20%	15.27
Fire Fighting	78.10%	11.76	59,998,225.00	95.40%	11.71
Material Handling	73.40%	14.60	34,134,892.00	91.20%	14.68
Snow Removal	77.30%	13.66	40,238,302.00	96.80%	13.68
Base Maintenance	85.60%	10.13	33,818,924.00	93.70%	9.95
Summary	**72.30%**	**13.22**	**466,843,615.00**	**90.90%**	**13.23**

E. Effects of ANG Shortfalls

Overall, the ANG has sufficient dual-use equipment for both the federal and state missions. However, as stated above in greater detail, key capability shortfalls remain in certain critical areas such as Communication and Logistics. Some are enhancements to current capabilities that will improve the overall effectiveness of existing efforts such as small arms training ranges, potable water production, storage and distribution, or the CERFP/HRF patient airway management equipment. Acquiring these assets significantly enhances potentially life-saving and sustaining abilities, more efficiently protects property, and increases the overall effectiveness of an ANG response to domestic events and natural disasters.

See Chapter 5, Section II, for additional information on ANG shortfalls in equipment and modernization. *ANG Priorities Books Link:* https://www.ang.af.mil/Home/ANG-Priorities-Books/.

F. ANG Requirements and Acquisition Strategies

ANG continues its focus on validating and mitigating readiness capability gaps and ensuring sustainment of these items is considered as an integral part when assessing lifecycle costs for any procurement. Gaps in capabilities critical to wartime and peacetime needs are identified and vetted in an open and rigorous forum of warfighters, who are experts in their respective weapons systems or fields. One venue is the annual Weapons and Tactics Conference, and its results are approved by the Director, ANG. A similar process is conducted at the annual Domestic Capability Priorities Conference. The capabilities identified and vetted at these conferences are translated into specific commercial off-the-shelf (COTS) or government off-the-shelf solutions, and nearly always require only non-developmental integration into a weapons system. These

capabilities and associated programs are documented in the annual *Air National Guard Weapons Systems Modernization Priorities book and Domestic Capability Priorities* book.

G. Specialized CBRN Equipment

Specialized CBRN equipment related specifically to NG CBRN Response Forces. Weapons of Mass Destruction-Civil Support Teams (WMD-CSTs): Support civil authorities during any CBRN incident which include use or threatened use of a WMD; terrorist attack or threatened terrorist attack; intentional or unintentional release of nuclear, biological, radiological, or toxic or poisonous chemicals; natural or manmade disasters in the United States that result, or could result, in the catastrophic loss of life or property by identifying hazards, assessing current and projected consequences, advising on response measures, and assisting with appropriate requests for additional support.

National Guard CBRN Response Forces. NG CRE forces include: the Weapons of Mass Destruction Civil Support Teams (WMD-CSTs), Homeland Response Forces (HRFs), Chemical, Biological, Radiological, Nuclear, High-yield Explosive (CBRNE), and CBRN Enhanced Response Force Packages (CERFPs). HRFs and CERFPs are joint task forces tailored and modular to provide life-saving capabilities during multiple or large-scale domestic CBRN incidents involving mass casualties from chemical, biological, radiological, nuclear, 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

WMD-CST Equipment Shortfalls:

Elimination of the Unified Command Suite (UCS) Modernization Program. The Army eliminated the Unified Command Suite (UCS) modernization program in FY 2020–FY 2024 FYDP (approximately $98.1 million).

Pharmaceutical Based Agents (PBAs), Detection, Medical Countermeasures (MCM), and Decontamination. WMD-CSTs currently have no effective detection equipment, down-range MCM, or decontamination capabilities for fentanyl or other PBAs. These gaps in equipment incur high risk to WMD-CST missions and significant risk to force. The risk to mission results from the inability of survey team members to obtain presumptive identification of a PBA to ensure public or unit safety or to obtain proper samples for field confirmatory identification in the Analytical Laboratory Suite (ALS). Current COTS MCM do not provide sufficient dosages to meet therapeutic levels to ensure survival and application of some COTS MCMs require exposing the soldier/airman to other potential hazards. Additionally, there exists no known effective decontaminate. Soap and hot water will decontaminate personnel, but the contamination will for most fentanyl derivatives remain a hazard in the run-off.

Field Confirmatory Analytics. The Analytical Laboratory System (ALS) was fielded 2003 through 2005 by the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD). The ALS consists of a prime mover (GMC 6500) and a large cargo box on back containing analytical equipment. The ALS was scheduled to be replaced by the Common

Analytical Laboratory System (CALS) in 2014. The CALS program has experienced numerous delays such as expected initial fielding to WMD-CSTs in 2022 (or later).

Radiological and Nuclear (R/N) Detection and Identification. WMD-CSTs have insufficient capability to detect and identify radiological or nuclear (RN) hazards (including special nuclear material) for the prevention of or response to domestic RN incidents. Army validated requirement for 57 Man-portable Radiological Detection Systems (MRDS) for WMD-CSTs; but, FY 2019–FY 2023 POM funded only 42. Army FY 2020–FY 2024 POM further reduced MRDS overall funding. NGB cannot determine specific impact to WMD-CSTs, but initial discussions with HQDA G8 indicate that WMD-CST fielding of the 42 MRDSs will be outside the FYDP.

HRF and CERFP Equipment Shortfalls:

Search and Rescue Reconnaissance. CERFP and HRF have insufficient capability to rapidly conduct tactical reconnaissance for locating victims in the hazard area and direct technical rescue search and extraction operations. In advance of life saving 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.

WMD-CST, HRF, and CERFP Equipment Shortfalls:

NG CRE Information Management System (NG CIMS). The NG CRE Forces do not have sufficient capability to provide an integrated CBRN Common Operating Picture at the tactical-level, nor the ability to share tactical information with mission partners and systems at the operational and strategic levels. The NGB is fielding NG CRE Information Management System to mitigate this capability gap. However, NG CIMS lacks long-term viability because it is not planned, programmed, and budgeted for as a DoD Program of Record (POR).

2. Effects of Shortfalls of Specialized Equipment

WMD-CST Equipment Shortfall Impacts:

Elimination of UCS Modernization Program. The elimination of UCS Modernization Program will result in all 57 WMD-CSTs becoming Non-Mission Capable (NMC) by 2022 and unable to perform their Congressionally-directed mission, as codified in U.S.C. 10 § 12310.

Pharmaceutical Based Agents (PBAs), Detection, Medical Countermeasures (MCM) and Decontamination. WMD-CSTs will experience unacceptable levels of risk to mission and force when confronting this pandemic threat.

Field Confirmatory Analytics. Impending obsolescence of critical analytical systems and the inability of NGB to sustain the aging ALS vehicle fleet will result in ALS becoming NMC as early as FY 2019. NGB requires a solution to mitigate ALS obsolescence for all 57 WMD-CSTs NLT FY 2019.

Radiological and Nuclear (R/N) Detection and Identification. Reductions in quantities and delays in fielding this capability will incur moderate risk to prevention missions in support of National Special Security Events (NSSEs) and state and local support missions. WMD-CSTs

also need vehicle-mounted radiological detection capability to identify, assess, and monitor affected areas.

HRF and CERFP Equipment Shortfalls:

Search and Rescue Reconnaissance. CERFP HRF Search and Extraction Elements will have to conduct reconnaissance using manpower intensive point and area reconnaissance techniques delaying the rescue of survivors and increasing the loss of life.

WMD-CST, HRF, and CERFP Equipment Shortfalls:

NG CIMS. Without a POR for NG CIMS capabilities, the NGB does not have the capability to provide for the long-term sustainment of NG CIMS.

3. Requirements and Acquisition Strategies for Specialized Equipment

WMD-CST Equipment Shortfalls:

Elimination of the UCS Modernization Program. NGB is seeking restoration of this funding in the FY 2021–FY 2025 Army Program Objective memorandum (POM).

Pharmaceutical based agents (PBAs), detection, medical countermeasures (MCMs) and *decontamination.* The Chemical Biological Defense Program (CBDP) is addressing gaps through investment in the Rapid Opioid Countermeasures (ROCs) program and through investment in the science and technology (S&T) to provide the threat agent science to focus development efforts for detection and decontamination. Additionally, CBDP is directly assisting the NGB by supporting table top-exercises (TTXs) and field experiments to assess TTPs to mitigate risks using existing MCMs, decontamination, detection capabilities and refine capability requirements for future materiel solutions.

Field Confirmatory Analytics. The CBDP is addressing capability gap by implementing a rapid acquisition approach by using an ALS Modified Work Order (MWO), which will provide a fully modernized ALS beginning in 1st Quarter FY 2019.

Radiological and Nuclear (R/N) Detection and Identification. NGB using National Guard and Reserve Equipment Appropriation (NGREA) funding has purchased an interim solution through the Joint Program Executive Office (JPEO)-CBRN commercial off-the-shelf modernization (COTS-MOD) process. Additionally, NGB will submit MRDS shortfall as an unfunded requirement UFR for the CBDP.

HRF and CERFP Equipment Shortfalls:

Search and Rescue Reconnaissance. Using National Guard and Reserve Equipment Appropriation (NGREA) funding, NGB, in coordination with the Joint Program Executive Office (JPEO)-CBRN and leveraging the COTS-MOD process, is experimenting with the use of Unmanned Aerial Vehicles (UAVs) to perform rapid search and rescue reconnaissance.

WMD-CST, HRF, and CERFP Equipment Shortfalls:

NG CRE Information Management System (NG CIMS). In coordination with the CBDP and within scope of the CBDP Integrated Early Warning Campaign Plan (IEW Campaign Plan), NGB will develop DOTMLPF Change Recommendations (DCRs) and Capability Development Documents (CDDs) to ensure NG CIMS capabilities are properly captured in appropriate requirements documents.

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 National Guard equipment inventory projection reported in previous NGRERs, and (2) a certification by the Chief, National Guard Bureau (CNGB) of the inventory of equipment items that were due to be procured for the National Guard 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 National Defense Authorization Act (NDAA), is the auditable path of approved funding and new procurement quantities enacted to track appropriated funds and requirements through the acquisition cycle to equipment delivery. The Secretary of the Army approved the process on February 25, 2015 (Army Directive 2015-13 [Equipment Transparency Policy]) to identify roles and responsibilities for Transparency stakeholders; with the Assistant Secretary of the Army for Acquisition, Logistics and Technology identified as the secretariat and overall Army policy lead for Army Transparency.

The Army continues to seek transparency improvements to facilitate the ARNG's ability to certify equipment deliveries. However, to date the ARNG is still unable to fully certify equipment delivery from appropriation and could not complete certification for new procurement and modernization for the last two consecutive quarters for FY 2018. This is in part due to both insufficient front-end data system source information and no significant change from the preceding quarters. P-1 and P-1R Form inconsistencies, along with LIN quantity suppression below the Acquisition Category (ACAT) I level, make tracking equipment end-point deliveries impossible without the benefit of reliable upfront database sources to verify funding against delivery. The certification of materiel delivery requires 100 percent confidence that a unit received an item and can be traced back to an appropriation year.

Although the information has not changed in this section, the process standards continue to be refined and actively managed. This is an enduring and evolving process to capture Army equipment delivery and transparency. The Army continues to oversee proposed changes and improved data collection in order to streamline the Transparency process, and believes that Item Unique Identification (IUID) at the equipment delivery end-point, in conjunction with fielding of the Global Combat Support System–Army (GCSS-Army) that was completed in 2018, provides the systematic database links required to fulfill Transparency. The ARNG has a requirement of 6,351 Handheld Terminal Tablets and 7,066 Scanners that utilize legacy Standard Army Management Information System reporting hardware. The ARNG will continue to work with the Army as the Executive reporting Agent to Congress on Transparency, but until a holistic

approach evolves that facilitates traceability from appropriation through delivery, it will be difficult to provide certification of equipment delivery and transparency.

B. Air National Guard

Equipment visibility and lifecycle management continues to be a priority in the ANG. Functional Area Managers and commanders maintain responsibility for the utilization of processes to enhance equipment accountability with current and future systems.

DOMOPS-related equipment assets are ordered, managed, and distributed through a process distinctly different than other ANG mission equipment. This process assigns a unique identifier in the Allowance Standards and on each unit's accountable record. This provides cradle to grave asset visibility throughout the lifecycle of these types of items. The ANG continues to work with the Air Force to suggest modifications to the Defense Readiness Reporting System to incorporate accurate visibility of assets, funding sources, status of resources, and other data-mining tools designed to provide a total picture of ANG equipment, personnel, and capability. Some progress has been made, but much work remains.

ANG is utilizing the Defense Property Accountability System (DPAS) as the Financial Improvement and Audit Readiness (FIAR) compliant system of record for the ANG vehicle fleet. The ANG, along with the Air Force Reserve, are the first components to make DPAS the Accountable Property System of Record for managing all equipment assets.

ANG FIAR implementation is fully underway. As part of Phase 1, units conducted base-wide inventories of all assets with a focus on classified items, pilferable supplies, and support equipment recorded on Customer Authorization/Custody Receipt Listings and retained in customers' possession. During Phase 2, all remaining support equipment assets stored in the Logistics Readiness Squadrons and other supply activities were reviewed. In the final phase, Phase 3, units are capturing new acquisition information and purchase order data from the various procurement activities to provide the final reconciliation and receipt process that certification requires.

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

Last year 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 two examples presented were the Air Force Reserve F-16C and the Army National Guard and Army Reserve HMMWV ambulances. This year, the Navy Reserve provides an illustration of the requirement for investment in the P-8A maritime patrol and reconnaissance capability—an update to the legacy P-3C Orion aircraft. 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 in making 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" towards 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" towards cutting edge capability.

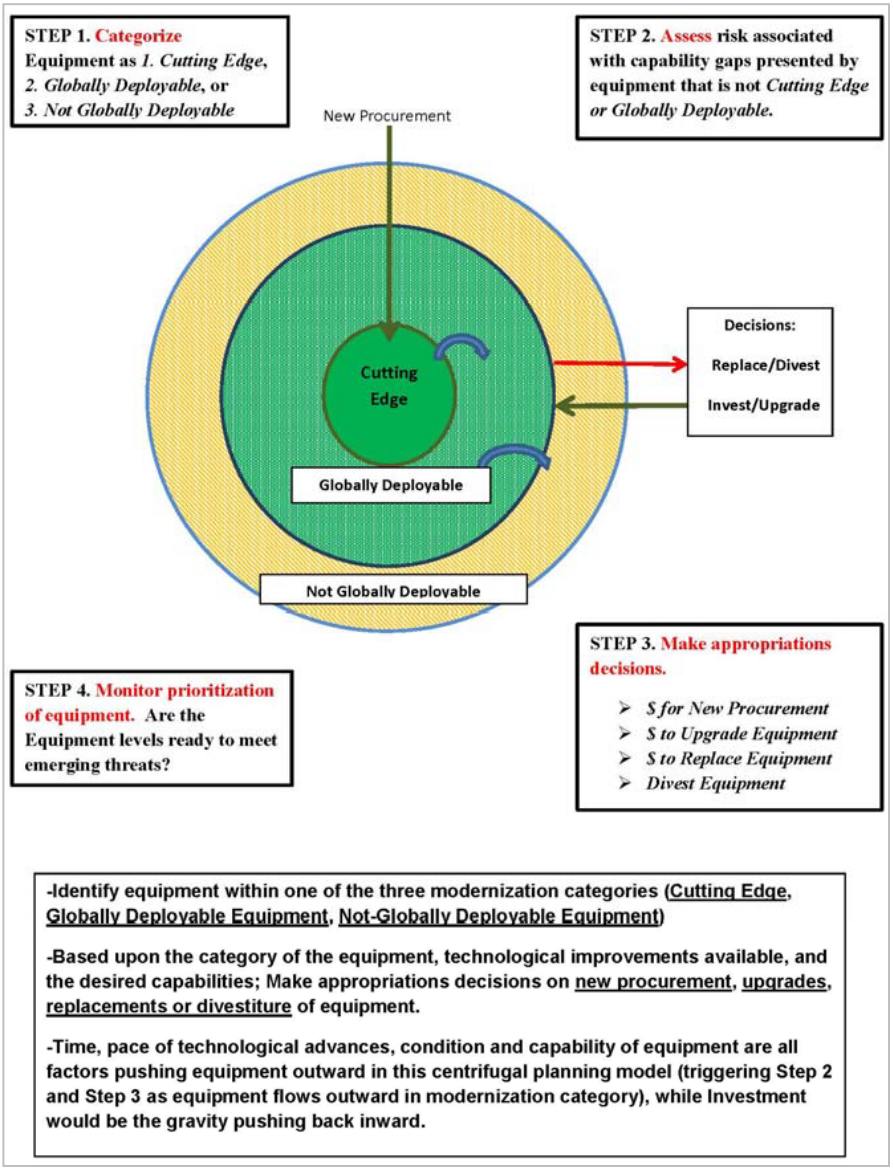


Figure C-1 Codification of Modernization Principles

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."

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, 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—P-8A Poseidon Capability

Capability Description: The P-8A Poseidon is the Navy's maritime patrol aircraft which provides long-range anti-submarine warfare (ASW), anti-surface warfare (ASUW) and significant intelligence, surveillance and reconnaissance (ISR) capability. It leverages state-of-the-art sensors and is interoperable with crewed and unmanned craft. It is the replacement for the P-3C Orion.

Background Information: The Navy Reserve operates two maritime patrol and reconnaissance squadrons which employ P-3Cs. Operational P-3Cs are scheduled to decommission in FY 2022 when the P-8A ISR systems are fully functional. The Navy Reserve's two squadron's, VP-62 in Jacksonville, FL and VP-69 in Whidbey Island, WA, are not scheduled to receive P-8A aircraft and will be disestablished at the end of FY 2022. This will eliminate strategic depth and surge capacity and minimize opportunity to realize a return on investment as Naval Aviators depart active duty. VP-62 and VP-69 regularly deploy in support of Global Force Management requirements, including covering several operational maritime patrol deployments while the AC transitions from P-3C into P-8A.

Programming & Funding Profile: Recapitalization of VP-62 and VP-69 is not funded in the Future Years Defense Plan (FYDP).

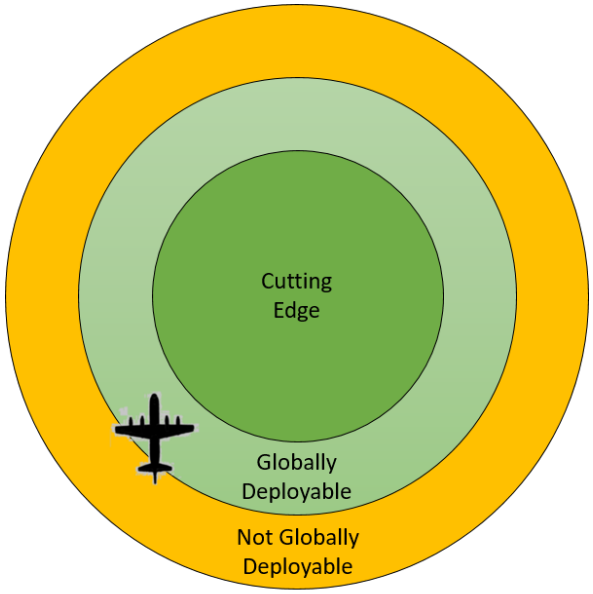
Application of the Modernization Model: In this section, we illustrate how the modernization model can be applied to inform procurement appropriation decisions.

Step #1: Categorize equipment. Equipment age, pace of technological advances, condition and capability of equipment are driving factors necessitating modernization investments. The following criteria is applied to determine the categorization of equipment. This is the initial step in making an appropriation decision.

Cutting Edge Technology: **No.**

- *Latest Technology?* **No.** P-3Cs are 1980s technology that provide robust but still outdated maritime patrol capability.

- *Upgrades or Replacements Identified?* **Yes.** The active component is currently transitioning into P-8A Poseidon aircraft and intends to sundown the P-3C Orion. There are currently no plans to extend P-3C beyond FY 2022. P-8A offers a generational leap in airframe range, endurance, speed and reliability over the P-3C. P-8A are on a schedule to incrementally improve mission systems capability.



- *Within 10 Years of Initial Operating Capability (IOC)?* **No**. The Navy P-3Cs are an average of 37 years old. Built by Lockheed, the first P-3C was produced in 1969; the last was produced in April 1990.

Globally Deployable? **Yes.** The P-3Cs will remain globally deployable right up until planned operational decommissioning at the end of FY 2022. VP-62 and VP-69 together will execute a one-year deployment in FY 2020 then will support a Prepare-to-Deploy Order for their last two years in service.

- *Technically Compatible?* **Yes.** However, P-3C systems are a generation behind current fleet architecture. While currently able to support the war fight, there is no more planned investment in P-3C mission system improvement.

- *Logistically Supportable?* **Yes.** Navy P-3Cs are logistically supportable within the existing maintenance support and supply chain. Navy will no longer provide operational P-3C logistics support beyond the end of FY 2022.

Step #2: Assess risk associated with capability gaps presented by equipment that is not Cutting Edge or Globally Deployable.

Risk: Without recapitalizing RC into P-8A the Navy loses maritime patrol and reconnaissance capability and capacity, including the entire strategic reserve of equipment and trained aircrews. Disestablishing the RC squadrons reduces the ability of the Navy to retain the sunk cost of trained aviators, many of whom traditionally fly a similar commercial variant aircraft in a civilian capacity.

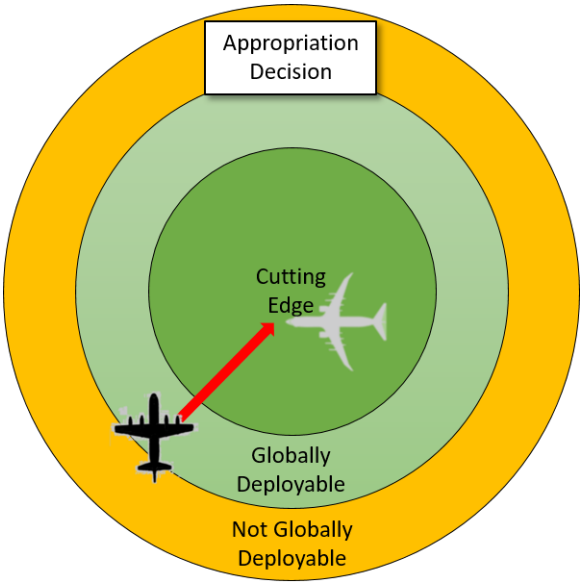
Step #3: Make Appropriation Decision. The decision to upgrade, replace or divest is informed by the level of risks being assumed by the force.

Decision to Upgrade. **N/A**. The Navy intends to retire the P-3C and disestablish VP-62 and VP-69. While some service life exists on the remaining P-3C fleet, depot maintenance will end before FY 2022.

Decision to Replace. **N/A**. The P-3C will be retired.

Decision to Procure New Equipment. The P-3C is being replaced by the P-8A. In order to retain RC capability and capacity to support a high end fight requiring strategic depth, the RC must transition into P-8A.

Decision to Divest. If nothing is done, VP-62 and VP-69 will disestablish and their P-3Cs will be stricken from Navy service at the end of FY 2022.



Status. In summer 2018, the Navy validated an expanded inventory requirement and approved recapitalization of the RC squadrons with six P-8As each. However, time will be short to program funding prior to Boeing P-8A production line closure. In the absence of funding, the RC will lose maritime patrol and reconnaissance capability at the end of FY 2022. Reserve P-8A procurement is and will be the Navy Reserve's number one significant major item shortage in FY 2019 and FY 2020.

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. Investing in a Navy Reserve maritime patrol and reconnaissance capability with P-8A aircraft is essential for the depth of the Navy bench.

Appendix D
Army Assessment of Equipment Parity

I. Reporting Requirement

This year, at the direction of Congress, the Chief of Staff of the Army (CSA) and the Chief, National Guard Bureau (CNGB) are required to provide an assessment on the efforts of the Army to achieve parity among the AC, the ARNG, and the AR with respect to equipment and capabilities. Section 111 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, National Guard and Reserve Component Equipment Report included this new requirement and Section 10541(b) of title 10, United States Code, has been appropriately amended as detailed below.[1]

(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 the 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

(b) Effective date.—The amendment made by subsection (a) shall apply with respect to reports required to be submitted under section 10541 of title 10, United States Code, after the date of the enactment of this Act.

II. OSD Evaluation

At the request of Congress, OSD is providing an evaluation of the Army's joint assessment of parity which is presented in the following pages. The CSA and CNGB signed separate cover letters to a single joint assessment.

In addition to the five platforms required to be assessed, the AC, ARNG, and AR agreed to include two additional systems: the Joint Battle Command-Platform (JBC-P) and the M4 carbine. Within the systems addressed, both the CSA and CNGB report that the Army does not have full equipping parity across all formations in the force.

In the assessment, the Army describes their equipping strategy to update the capabilities of key platforms in order to increase lethality and improve readiness. They provide an explanation of equipping and modernization decisions within the constraints of finite resources and extended procurement and distribution timelines. Current investment is focused on development of the "big six" programs while continuing investment in upgrading and improving existing systems. As new,

[1] Title 10 U.S.C, Chapter 1013, Section 10541, "National Guard and Reserve Component Equipment: Annual Report to Congress" as amended by Pub. L. 115-232

modern items displace currently fielded items, the Army cascades the less capable items to the next priority unit. Within this strategy, the Army works to ensure interoperability between formations.

This assessment shows that, using this equipping model, for five of the seven platforms assessed, the Army RCs will remain at least one generation behind the AC for the foreseeable future. The CSA acknowledges the risks to combat effectiveness and interoperability of not achieving parity, but determined that, while the capabilities may not be identical, the differences in platforms are within an acceptable range of operational risk. However, the CNGB notes in his cover memo that, to meet the goals of the 2018 National Defense Strategy, it is imperative there be no disparity between the Regular Army and reserve components with respect to future modernization and recapitalization plans.

This is the inaugural joint assessment of parity; subsequent reports should continue to refine data presented. For example, this assessment does not provide an inventory comparison or specifics of a funding and investment strategy for all of the platforms. (Using inventory data that OSD (Comptroller) provided, an inventory comparison is presented as part of the OSD assessment in Chapter 1). Future assessments could also consider counting equipment in the inventory of units outside of the Brigade Combat Teams (BCT).

UNITED STATES ARMY

THE CHIEF OF STAFF

15 FEB 2019

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. Fiscal Year 2019 National Defense Authorization Act, Subtitle B – Army Programs, Section 111.

2. In accordance with reference 1b, I am submitting the Army's first joint assessment of modernization equipment parity among the Regular Army, Army Reserve, and Army National Guard with the enclosed Fiscal Year 2020 National Guard and Reserve Equipment Report. This report was prepared among Regular Army, Army National Guard, and Army Reserve leaders to fully meet the joint spirit and intent.

3. The Army manages parity between like component formations based on threat and combatant commander requirements. Consequently, the Army is able to (1) ensure units most likely to deploy in support of combatant command (COCOM) operational plans, regardless of component, receive the most modern equipment and (2) logically outfit the three components with the best equipment within available resources.

4. Currently, the Army does not have full equipping parity across all formations in the force. The Army principle at work is first to fight is first to equip, and not concurrent and proportional. The Army equipping model, optimized to reduce operational risk, is fundamentally different than the Air Force concurrent and proportional model. The Army equips units in support of combatant commander requirements based on anticipated deployment and employment timelines. This model supports deterrence objectives by prioritizing modernization of forward-based forces. Should deterrence fail, the Army model ensures units that make contact first possess the most capable equipment. As a result, component (COMPO) 1 units by and large are modernized first in the Army -- while a majority of COMPO 2 and 3 units possess highly capable, yet less modern equipment. However, there are also ARNG and USAR units that deploy before Regular Army units, and those units will be modernized before Regular Army units. Over time and given adequate resources, the Army goal is to achieve parity across the three components. Additionally, there is not parity within components, let alone

between components, and most like type Regular Army units are not equipped exactly the same.

5. The three components agreed on the metrics and definitions used to assess the seven systems in this report. The assessment revealed that the Army has sufficient modern equipment on hand to meet mission requirements. However, a higher percentage of the most modern items reside in the Active Component, as guided by COCOM requirements and available resources.

6. The point of contact for this memorandum is Colonel Edwin B. Rice, Acting Deputy to the Assistant Secretary of the Army (Manpower and Reserve Affairs), 703-692-2854 or edwin.b.rice.mil@mail.mil.

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Assistant Secretary of the Army (Manpower and Reserve Affairs)
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FEB 0 4 2019

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR READINESS

SUBJECT: Joint Parity Assessment National Guard and Reserve Component Equipment Report

References: (a) Title 10 United States Code, Section 10541, "National Guard and Reserve Component Equipment: Annual Report to Congress"

(b) Fiscal Year 2019 National Defense Authorization Act, Subtitle B—Army Programs, Section 111

In accordance with reference b, I submit my first assessment of modernized equipment parity among the Regular Army, Army Reserve, and Army National Guard with the enclosed Fiscal Year 2020 National Guard and Reserve Equipment Report (NGRER). This assessment reveals a higher percentage of the most modern items reside in the Active Component. As such, the Army does not have full equipping parity across all formations in the force.

The strategic assessment set forth in the 2018 National Defense Strategy is clear; all formations in the Total Army must be interoperable and equally lethal and survivable in order to "compete, deter, and win". As there is one standard for readiness to fight our Nation's wars, so must there be one standard for equipping. Consequently, it is imperative there be no disparity between the Regular Army and reserve components with respect to future modernization and recapitalization plans.

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Enclosure: As stated

Annex D (Army)

Joint Assessment on Efforts to Achieve Parity

To properly assess Army efforts to achieve parity in fielding of equipment, we must clearly articulate how the Army modernizes and clearly define parity in terms of the 2019 NDAA requirement. Currently, the Army does not have parity across all lines of equipment between the Regular Army (RA) and the Reserve Components (USAR & ARNG). Of the seven items assessed, the ARNG will achieve parity for three by Fiscal Year (FY) 2026; the AH-64 Apache, the M-4A1 Carbine, and the Joint Battle Command Platform (JBC-P). The USAR will achieve parity for JBC-P in FY2024, M4A1 in FY2022. A summary of requirements, on-hand quantities and a parity assessment is provided for the five high priority items of equipment required by the NDAA in addition to two other items for inclusion as agreed upon by all components of the Army.

Definition of Modern: The Army defines modernization based upon a piece of equipment's disposition reference its procurement lifecycle. An item on an authorization document (as codified on a unit's Modified Table of Organization and Equipment (MTOE)) is considered the minimum mission essential wartime requirement and is, therefore, modern. The Army mandates units use on-hand authorized substitute equipment to fill any capability gap when there are shortfalls or delays in modernization. Equipment items are not removed from a unit MTOE until they are classified obsolete.

There are five modernization levels (MOD level) in the Army: Level 1 items = obsolete; Level 2 = for training purposes only and not deemed adequate for combat operations; Level 3 = combat-capable items that have completed their procurement phase; Level 4 = still in procurement/ modernization phase; and Level 5 = the most modern items that are in development or low rate initial production (LRIP). All equipment listed on unit MTOEs are MOD Levels 3 and 4. Tables of Distribution and Allowance (TDA) units may have MOD Level 2 items on their authorization document. Therefore, modern equipment in the Army is determined by status of that equipment in its procurement lifecycle and determination of its combat effectiveness. Only combat effective equipment is documented on a units MTOE.

Definition of Parity: Section 10541(b) of Title 10 was amended 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 Army or "pure-fleet". However, the Army is limited to equipping all like-type formations with the same variants of key equipment due to finite resources and extended procurement and distribution timelines. Additionally, to effectively deter and defeat the most dangerous threats, 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 capable variants of key systems to balance capability and capacity requirements.

Equipping the Force: The Department of Defense's enduring mission is to provide combat-credible forces to deter war and protect the security of our nation. To execute these missions the Army equips formations to meet Combatant Commanders' warfighting, Homeland Defense and strategic competition requirements. Modernization decisions attempt to sustain a lethal, resilient and adaptive Total Force that minimizes risk. As modernized items displace currently fielded older – yet operationally effective - items, the Army cascades the less capable items to the next priority unit, regardless of component. When cascades occur, the Army works to ensure interoperability between formations with different variants of systems. Whenever possible within resources available, the Army strives to achieve parity in equipping across the Total Force.

Risks of not achieving Parity: The Army is transitioning to a more agile acquisition process aimed at providing greater flexibility to take advantage of technological advancements in preparation for potential conflicts with near-peer competitors. As such, investment are focused on development of the "big six" programs that include: long-range precision fires, next-generation combat vehicle, future vertical lift family of helicopters, air and missile defense, soldier lethality and networked communications. In this environment, the Army is not modernizing all formations at the same rate. Within this resource prioritization model, the ARNG and USAR primarily receives cascaded equipment rather than new procurement to replace legacy equipment and fill shortages.

The main risks for not having parity and having multiple variants of key systems across the force are with combat effectiveness/lethality and interoperability. Less modern systems bring less capability to bare in a conflict and thus may be employed differently in combat operations. Different variants of a system also must be interoperable and able to seamlessly integrate with other formations to ensure cohesion across the Total

Force. Therefore, thorough assessment of combat effectiveness is critical to ensure appropriate MOD level 2 designation for system variants which in turn informs modernization and authorized substitution decisions.

Multiple variants of key systems necessitate variances in training requirements and standards as well as require multiple sustainment processes, different equipment, more facilities, and additional manpower. Decreased reliability and durability of older systems also requires additional resources to maintain readiness levels expected to meet operational demands. This risk is compounded in the Reserve Components where limited training time and Full Time Staffing (FTS) levels can restrict the ability to build and sustain readiness, especially with units fielded with older or a mix of variants for key systems. Therefore, the Army takes great care to consider operational impacts, lifecycle sustainment costs, and resources available when developing its modernization strategy. The objective is to plan for the design, development, fielding and sustainment of the most capable and combat-credible Total Force to meet mission requirements.

Joint Assessment: To assess modernization and parity of the five systems (Abrams, Bradley, Stryker, Apache, and Blackhawk) directed in the FY2019 NDAA, the Army determined all the line item numbers (LINs) of these systems, their MOD level, and their authorization and on hand quantities by component. All three components agreed to include two additional systems: the Joint Battle Command-Platform (JBC-P) due to its impact on interoperability across the components, and the M4 carbine as a common Soldier lethality item. This annex will address each system with an explanation of the Army's strategy for modernizing that specific capability.

Within the systems addressed in this Annex, 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 Regular Army (RA) (COMPO 1).

1. Abrams Main Battle Tank

The Army will have three Abrams tank variants through the time period of this report. The newest tank, the M1A2 SEPv3 (LIN: Z05278), is in production, and will begin fielding in FY2020. The first unit fielded will be the Army Preposition Stocks (APS) in Europe. The Army will field one Armor Brigade Combat Team (ABCT) per year beginning in FY2021. As the M1A2 SEPv3 is fielded to Regular Army (RA) units equipped with the M1A2 SEPv2 (LIN:T13305), the M1A2 SEPv2 will cascade to Army National Guard (ARNG) M1A1 AIM-SA (LIN: T13168) units. The cascade will begin in FY2023 and be complete in FY2025.

Abrams modernization has been going on for over thirty years. The latest variant of the Abrams, the M1A2 SEPv3, incorporates upgraded Armor, improved power and data distribution, and an ammunition data link to allow the tank to fire advanced ammunition.

There is minimal risk with having 4 ABCTs (1 RA / 3 ARNG) equipped with the M1A1AIM SA. The M1A1AIM fires the same ammunition and has comparable protection compared to the more modern versions of the Abrams. Primary differences are the use of applique systems for communication and battle tracking versus integrated systems and the addition of the commander's independent thermal viewer on the M1A2 SEPv2/3.

Parity Assessment. Under the current fielding plan, the ARNG will receive cascaded M1A2 equipment from the Regular Army. Once the fielding of the cascaded equipment is complete in FY2025, the ARNG will be one variant behind the Regular Army.

2. Bradley Fighting Vehicle

The Army has two Bradley variants, the M2A2 ODS-SA (LIN:P19727) and the M2A3 (LIN:F60564). The newest upgrade to the Bradley, the M2A4, is currently in initial production and will be fielded to APS in Europe in FY2020/FY2021. The Army will field one ABCT per year beginning in FY2021. As the M2A4 is fielded to RA units equipped with the M2A3, the M2A3s cascade to ARNG units that have the M2A2ODS-SA. The cascade will begin in FY2023 and be complete in FY2025.

Bradley modernization has been going on for over thirty years. The latest variant of the Bradley, the M2A4, provides mobility improvements including a 675 HP power pack upgrade, an 800 HP transmission upgrade, cooling system modifications, and upgraded final drives. Electrical power upgrades increase output from 400 amps to 990 amps and adds a high speed slip ring upgrade to the M2A4 platform. The Army has established a Cross Functional Team (CFT) to develop and produce the successor to the Bradley, currently called the Next Generation Combat Vehicle (NGCV). The current NGCV time line is to equip the first ABCT in FY2026.

There is minimal risk with having four ABCTs (1 RA / 3 ARNG) equipped with the M2A2 ODS-SA. The M2A2 ODS-SA fires the same ammunition and is comparable in protection to the M2A3. Primary differences are the use of applique systems for communication and battle tracking versus integrated systems and the addition of the commander's independent thermal viewer on the M2A3/A4.

Parity Assessment. Under the current fielding plan, the ARNG will receive cascaded more modern variants of the M2 from the Regular Army. Once the fielding of the cascaded equipment is complete in FY2025 the ARNG will be one variant behind the Regular Army.

3. Stryker Vehicle

The Army currently maintains nine Stryker Brigade Combat Teams (SBCTs), three Double-V Hull (DVH) SBCTs and six Flat Bottom Hull (FBH) SBCTs. Seven of those

SBCTs are in the RA, three of which are DVH SBCTs. The ARNG maintains two FBH (A83852, C41315, J22626, J97621, M30567, M53369, M57720, R62673) SBCTs. Following an approved Army Requirements Oversight Council decision to pure- fleet the SBCT with DVH and DVHA1 (E05010, A05037, C05052, M05032, M05033), the Army plans to replace all FBH Strykers with DVH Strykers.

Stryker modernization is divided into two efforts: FBH to DVHA1 conversions and lethality upgrades. The Army will determine the Stryker lethality upgrade path in 2nd quarter FY2019 based on outcomes from the 30mm lethality upgrades provided to 2nd Cavalry Regiment.

The Flat-Bottom Hull (FBH) Stryker Brigade Combat Teams (SBCTs) (5 RA / 2 ARNG) have greater mobility but reduced protection to underbelly blast when compared to the Double-V Hull (DVH) SBCTs.

Parity Assessment. There are 18 variants in the Stryker FoVs making parity across the full spectrum of the fleet difficult to fully assess, particularly as the variants are specialized by mission function. Effective assessment measures must start with key performance parameters such as major investment modifications (lethality) and hull design. The investment profile of the Army indicates a recognition of this. The pure fleet decision is a positive step toward parity; however prioritization of DHVA1 fielding will determine how quickly parity is achieved. The current procurement plan to upgrade to the DHVA1 will span 14 years. The decision regarding pure fleet lethality upgrades is pending. Until a standard configuration by variant is achieved, full employment of capability will be impacted.

4. AH-64 Apache

The Army has two variants of Apache in inventory. The modernization strategy for Apache is the complete remanufacture of the AH-64D (H41898) using a new airframe and re-using over 700 parts. The end result is the Army's only attack helicopter, the AH-64E (H05006), which is fully digitized 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 many other improvements.

ARNG Attack Reconnaissance Battalions will be fielded in FY2022, FY2023, FY2025, and FY2026. The last active component Battalion will be fielded in FY2027. The risks associated with a mixed fleet of AH64 variants is 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 ARNG expects to achieve one on one parity with the Regular Army with pure fleeting of the most modern AH-64E technology by FY2026.

5. H-60 Blackhawk

The Blackhawk is the multi-purpose medium lift helicopter in the Army's inventory. There are multiple variants that support various mission requirements within the Army's inventory.

The Army's plan for modernizing its entire UH-60 aircraft fleet is accomplished through divestment of all UH-60A (K32293) aircraft by FY2023, procurement of the UH/HH/MH-60M (H32429/ M33458/M85588) through FY2028, and procurement of UH/HH-60V (previously referred to as UH-60L Digital) (H32361/U84291) from FY2018 through FY2035. Beginning in FY2018, the Army initiated the recapitalization and digitization of the UH-60L fleet into the UH-60V series. The procurement of new build H-60M aircraft supports the divestment of H-60As and the cascading of H-60Ls to backfill H-60A equipped units. The recapitalization of H-60L to H-60Vs will further support the replacement and divestment of ARNG and USAR H-60Ls NLT FY2037.

Upon completion of Army Aviation H-60 procurement objectives, the ARNG end state fleet will consist of 907 UH-60 aircraft: 535 H-60M and 372 UH-60V. The USAR end state fleet will consist of 144 H-60 aircraft: 30 HH-60M and 114 UH-60V. The numbers include both assault and medical evacuation variants.

Delays in modernization cause extended reliance on outdated analog and federated H-60L cockpit systems which significantly reduces situational awareness, increases pilot workload, and decreases mission readiness.

Parity Assessment. The current fielding plan incrementally improves the capability of the ARNG fleet, but does not achieve parity with the Regular Army.

6. Joint Battle Command-Platform (JBC-P)

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 in meeting Army's requirements in the Joint operations.

The Army is modernizing the JBC-P family of systems by divesting its oldest Hardware/Software (H/S) systems (C13866, C18278, C18378, and C78851) and

replacing them with a more capable family of H/S systems (C05036, C05037, C05054 and C05055). The older H/S systems are less capable and do not address today's cyber vulnerabilities. The Army addressed this by increasing JBC-P investments by $781 million above the previous base in FY17-22 to accelerate procurement. The Army expects to pure-fleet JBC-P across the Army (over 103,000 H/S Systems) by FY2024.

Parity Assessment. The current fielding plan completes procurement of the currently identified JBC-P system requirements by FY2023. However, current procurement objectives may not capture all requirements to provide interoperable C2 and situational awareness capabilities to the Total Force. Further analysis may be required to determine objective end state requirements.

7. M4 Carbine

The M4/M4A1 carbine is designed for lightness, speed, mobility and firepower. Compared to the M4, the M4A1 has a heavier barrel and is fully automatic, improvements that deliver greater sustained rates of fire.

The Army is pure-fleeting with M4A1 (C06935) carbines through conversion of M4 (R97234) to M4A1 systems via the M4 Product Improvement Program (PIP) and replacement of M16A2 (R95035) and M16A4 (R97175) rifles with new production M4A1 carbines. The Army Acquisition Objective of 845,563 carbines is supported in POM 20-24 with 461,152 total PIP modifications of M4 carbines to M4A1 and procurement of 384,411 new production M4A1 carbines. The total requirement for all M16/M4 family of weapons is 817,589.

The PIP program is scheduled to be complete by the end of FY2020 and new production and fielding of M4A1 carbines is scheduled to be completed by the end of FY2022. The Army is on track to accomplish its pure-fleeting goal for the total force.

Parity Assessment. Based on the current fielding plan, the ARNG and USAR will achieve parity with the Regular Army in FY2022

Appendix E
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Appendix F
Acronym Glossary

Acronym	Nomenclature
AAO	Approved Acquisition Objective (Marine Corps)
AAV	amphibious assault vehicle
ABCT	Armored Brigade Combat Team
AC	Active Component
ACA	Aerospace Control Alert
ACAT	acquisition category
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
ALS	Analytical Laboratory Suite
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
AOC	Air Operations Center
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
ASU	anti-surface warfare
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
CALS	Common Analytical Laboratory Suite
CART	cargo afloat rig team
CAS	close air support
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
CSA	Chief of Staff of the Army
CSAR	combat search and rescue
CSS	combat service support
CST	Civil Support Team
CTC	Combat Training Center
CTOC	Counter-Transnational Organized Crime
CW	cyber warfare
DARNG	Director, Army National Guard
DCGS	distributed common ground system
DET	Displaced Equipment Training
DHS	Department of Homeland Security
DIB	defense industrial base
DIRECT	Disaster Incident Response Communications Terminal
DLA	Defense Logistics Agency

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
FMC	Full Mission Capable
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
FVL	Future Vertical Lift
FY	fiscal year
FYDP	Future Years Defense Plan
G/ATOR	Ground/Air Task Oriented Radar
GA	Guardian Angel
GAO	Government Accountability Office
GBSAA	Ground-based Sense and Avoid
GCS	ground control station
GCSS-Army	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

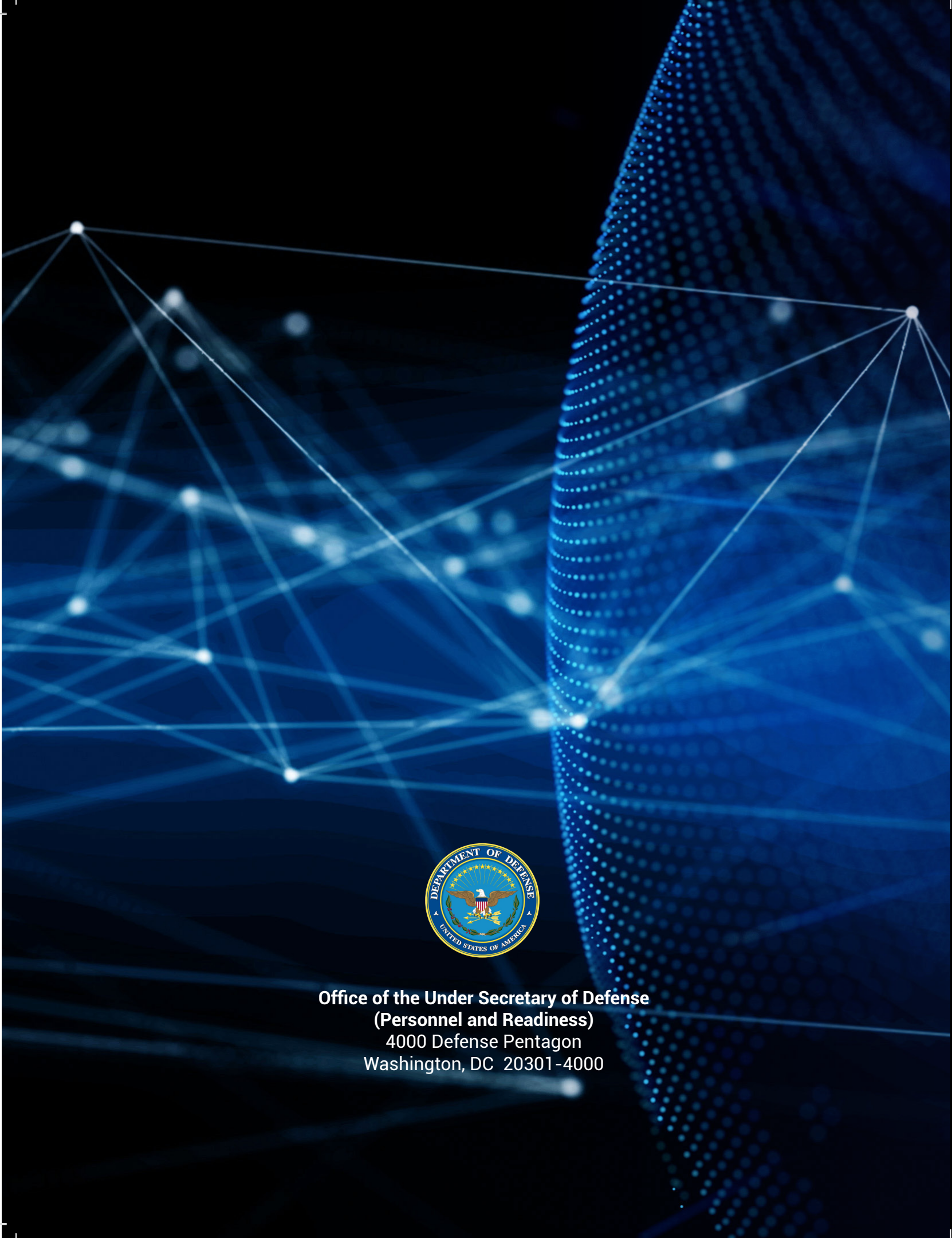
HEA	Heavy Equipment Airdrop
HEMTT	heavy expanded mobility tactical truck
HH	Hospital Helicopter
HIPPO	Load Handling System Compatible Water Tank Rack
HMEE	High Mobility Engineer Excavator
HMIT	helmet-mounted integrated targeting
HMMWV	high mobility multipurpose wheeled vehicle
HQDA	Headquarters, Department 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
IPT	integrated project team
IR	infrared
IRST	Infrared Search and Track
ISO	International Organization for Standardization
ISR	intelligence, surveillance, and reconnaissance
ISSE	information support server environment
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
JFACC	Joint Forces Air Component Commander
JHMCS	joint helmet-mounted cueing system
JISCC	Joint Incident Site Communications Capability
JLTV	Joint Light Tactical Vehicle
JPEO	Joint Program Executive Office
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
LVC	live, virtual, constructive
LVSR	Logistics Vehicle System Replacement
MAAWS	Multi-role Anti-Armor Anti-Personnel Weapon System
MAF	mobility air forces
MASS	Modular Aerial Spray System (Air Force)
MCM	medical countermeasures
MCS	Manuever Control System
MDS	mission design series
MECP	Mobile Entry Control Point
MEDEVAC	medical evacuation
MEOC	Mobile Emergency Operations Center
MEOH	Modernized Equipment On-hand (MEOH) (Army)
MFS-TRM	Modular Fuel System-Tank Rack Module
MH	multimission helicopter
MIDS	Multi-functional Information Distribution System
MIDS-JTRS	Multifunctional Information Distribution System Joint Tactical Radio System
MIO	maritime interdiction operations
MIRCS	Mobile Integrated Remains Collection System
MISO	military information support operations
MMCT	Multi-Mission Crew Trainers
MPF	Maritime Prepositioning Forces (Navy)
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
NBG	Naval Beach Group
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
NDS	National Defense Strategy
NECC	Navy Expeditionary Combat Command
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
NMC	non-mission capable
NMCB	naval mobile construction battalion
NSS	National Security Strategy
NSSE	National Special Security Events
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
O&S	operating and support
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
OSHA	Occupational Safety and Health Administration
OSRVT	One System Remote Video Terminal
OTI	Operational Training Infrastructure
P-1	Service Procurement Programs
P-1R	Service Procurement Programs - Reserve Components
PDM	Programmed Depot Maintenance
PIM	Paladin Integrated Management
PIRL	Prioritized Integrated Requirements List
PLS	palletized load system
POM	program objective memorandum
PPBE	Planning, Programming, Budgeting, and Execution
PPE	personal protective equipment
PPP	public-private partnerships
PRESBUD	President’s Budget
Prime BEEF	Prime Base Engineer Emergency Force
PRP	Personnel Retrieval and Processing
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
RN	radiological or nuclear
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
S&T	science and technology
S2E2	Survivable/Endurable Evolution
SABIR	Special Airborne Mission Installation and Response
SATCOM	satellite communications
SBAS	Satellite Based Augmentation System
SBCT	Stryker Brigade Combat Team
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
SMGT	SBIRS Mobile Ground Terminals
SMP	Strategic Master Plan (Air Force)
SMTC	Special Missions Training Center
SOF	special operations forces
SOPP/GFM	Standard Operational Planning Process/Global Force Management
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
SW	special warfare
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
TFA	Total Force Associations
TF-C	Total Force Continuum
TFI	Total Force Integration
TOA	table of allowance (Navy)
TPSB	transportable port security boat
TSU	tactical support unit
TSW	Tactical Support Wing
TTX	table top-exercise
TWV	tactical wheeled vehicle
U.S.	United States

U.S.C.	United States Code
UAS	unmanned aircraft system
UAV	unmanned aerial vehicle
UCS	unified command suite
UHF	ultrahigh frequency
UPL	Unfunded Priority List
US&R	Urban Search and Rescue
USAF	United States Air Force
USAR	United States Army Reserve
USCENTCOM	United States Central Command
USCG	United States Coast Guard
USCGR	United States Coast Guard Reserve
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
VOR/ILS	VHF Omni-Directional Ranging/Instrument Landing System
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
WSS	Weapon System Sustainment



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