

RECORD VERSION

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BEFORE THE

**SUBCOMMITTEE ON AIRLAND
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INTRODUCTION

Chair Duckworth, Ranking Member Cotton, distinguished Members of the Senate Armed Services Subcommittee on Airland, thank you for your continued support and enduring commitment to our Soldiers, our Civilians, and their Families. On behalf of the Secretary of the Army, the Honorable Christine Wormuth, and the Army Chief of Staff, General James C. McConville, we thank you for the invitation to appear before you today.

Our shared mission is to make sure that the Army continues to achieve overmatch against all potential adversaries, ensuring that our Army can fulfill its mandate to compete successfully, deter, and, if necessary, fight and win our Nation's wars as part of the Joint Force.

We support the Army's transformation through persistent modernization in order to meet future challenges. Even during a global pandemic, this past year has been one of dramatic change, rapid innovation, shared challenges, and significant progress with an unprecedented unity of effort across the Army modernization enterprise. The Army is boldly transforming to provide the Joint Force with the speed, range, and convergence of the cutting edge technologies that will be needed to provide future decision dominance and overmatch for great-power competition.

The Army is transforming how we fight, what we fight with, how we organize, how we do business, and who we are. We are already realizing the benefits of these efforts. Your support of our Fiscal Year 2022 (FY22) budget request will ensure we are able to achieve persistent modernization.

THE STRATEGIC ENVIRONMENT

The Interim National Security Strategic Guidance highlights an increasingly assertive People's Republic of China and increasingly disruptive behavior from Russia. China is

our pacing threat. Both states are applying all instruments of national power, including military modernization as they compete aggressively with the United States.

China is progressing in artificial intelligence (AI), robotics, and cyber. Advancements in hypersonics add to its strategic reach, endangering some of our traditional force projection assets. Both China and Russia have also committed to an increased pace and scope of military exercises, honing their joint warfighting capability, while China went through a large scale restructure and change of leadership to reinforce and enhance its modernization goals.

In addition to these traditional threats, the United States is facing increased competition in the Arctic, challenges resulting from climate change, and the prospect of future pandemics. The Army's modernization efforts take these new realities into account as we define capability requirements and develop new concepts.

HOW WE FIGHT

Our Multi-Domain Operations concept describes how we fight—by continuously converging effects across all domains, at the speed of relevance. We are in the process of transitioning this concept to doctrine in order to ensure the Army is capable and ready to support Joint Force operations. At the same time, we are working to develop the future concept based on future threat assessments, emerging Science and Technology (S&T), and experimentation. We established “Team Ignite” in order to create feedback loops among these efforts and inform how we will fight in the future.

WHAT WE FIGHT WITH

The Army remains committed to our six consistent modernization priorities: Long Range Precision Fires, Next Generation Combat Vehicle, Future Vertical Lift, Network, Air and Missile Defense, and Soldier Lethality. In FY22, the Army continues to focus on

building a multi-domain force by divesting some equipment that does not support future warfighting capabilities.

We are grateful to Congress for the stable funding provided to support our modernization efforts. The FY22 President's Budget Request continues to fund our six priorities, as we aggressively pursue our "31+4" signature modernization systems.

The FY22 budget builds on the progress we have made across all modernization priorities to align requirements developers with acquisition experts and representatives from the testing, logistics, science and technology, and other communities, dramatically reducing the time span from identification of a capability gap to prototype testing and operational experimentation. Within each area, we highlight our recent progress, our partnership, and the way forward with continued, steady funding.

- The Long Range Precision Fires (LRPF) Cross-Functional Team (CFT) is partnered with Program Executive Office (PEO) Missiles and Space:
 - The Army's Extended Range Cannon Artillery (ERCA) can now shoot in the 70 kilometer range with accuracy. We are on track to field the first ERCA battalion in FY23.
 - We had a successful and accurate flight test of our Precision Strike Missile (PrSM) in 1QFY20. We will begin fielding PrSM in FY23.
 - The Army Rapid Capabilities and Critical Technologies Office (RCCTO) continues to make progress in delivering the first hypersonics battery in FY23. Working closely with the CFTs, RCCTO manages the development and production of the Army's hypersonics effort, the Long Range Hypersonic Weapon (LRHW). With a successful flight test in March 2019, the program has additional joint flight tests planned in FY21-23 to validate the Common Hypersonic Glide body design, the Army launcher and the Command and Control system. Also, later this year, RCCTO will field the road mobile, C-17 transportable prototype battery to an operational unit, minus the

missiles. This will allow the unit's Soldiers to start training with the equipment so they are ready when the missiles arrive in FY23, providing the Army with a hypersonic capability.

- Additionally, RCCTO received the Mid-Range Capability (MRC) mission in July 2020, which leverages existing Service missiles, software, and hardware to fill a critical capability gap identified by the U.S. Indo-Pacific Command (INDOPACOM). The MRC prototype will be fielded to an operational battery in FY23.
- The Next Generation Combat Vehicle (NGCV) CFT is partnered with PEO Ground Combat Systems:
 - The decision to revisit the characteristics, acquisition strategy, and schedule of the Optionally Manned Fighting Vehicle (OMFV)—very early in its cycle—is the type of decisive action that working as an integrated team enables. We remain committed to the OMFV program. The need for this ground combat vehicle capability is real. It is imperative we get it right for our Soldiers.
 - The Robotic Combat Vehicle will undergo increasingly rigorous experiments and capability demonstrations between FY22 and FY24, with a decision to procure or reassess no later than FY24.
 - The Armored Multi-Purpose Vehicle is currently fielding and is an adaptable and more survivable general-purpose, mortar carrier, medical evacuation, medical treatment, and mission command vehicle that replaces the 1960s-era M113 Family of Vehicles.
 - In 4QFY25, we are on track to deliver the first fielding of Mobile Protected Firepower (MPF) and to give our light infantry much needed firepower.
- The Future Vertical Lift (FVL) CFT is partnered with PEO Aviation:
 - Following the successful firing of a SPIKE Non-Line of Sight (NLOS) missile from an AH-64E Apache in 4QFY19, we will achieve Initial

Operational Capability (IOC) in FY23 with three Combat Aviation Brigades. This capability extends range by four times over our current HELLFIRE missiles.

- The Future Attack Reconnaissance Aircraft (FARA) closes the gap left by retirement of the Kiowa. Two prototypes will fly in FY23, followed by a year-long flight demonstration.
 - The Future Long Range Assault Aircraft (FLRAA) will replace part of the UH-60 Black Hawk fleet with increased speed, range, payload, and endurance. We expect initial FLRAA prototypes in FY25.
 - FVL will leverage advances in Unmanned Aircraft System (UAS) technology to develop the Shadow replacement and Air Launched Effects, which includes a wide array of payloads and extended communication mesh networks with a fielding plan in FY25.
- The Network CFT is partnered with PEO Command, Control, Communications-Tactical:
 - We are currently fielding Capability Set 21, including commercial radio, satellite communications, and cross domain solutions of the Integrated Tactical Network to four Infantry Brigade Combat Teams in FY21, and a newly modernized, agile, and scalable tactical network transport tool suite to three Expeditionary Signal Battalions-Enhanced. These capabilities allow our commanders greater connectivity options, make the network more intuitive for our Soldiers, and increase interoperability with allies and partners. Soldier feedback and experimentation will inform continued fielding of Capability Set 21 in FY22, as well as Capability Set 23.
 - Congruent with Network modernization, the Army is seeking to modernize Global Positioning System (GPS) receivers to meet current and emerging threats by providing the Joint Force with advanced, assured positioning, navigation, and timing (PNT) systems. Included are modernized receivers that meet Congressional mandates to

transition to M-code GPS and integrate alternative PNT technologies for our ground combat platforms, dismounted Soldiers, precision weapons and munitions, and aviation systems.

- We are currently fielding the first generation mounted assured PNT systems to our forward deployed formations with a second generation ready for fielding no later than FY23. We are in the process of evaluating solutions for dismounted Soldiers and continuing work on precision weapons and aviation variants. The Army recently approved development of Navigation Warfare tools to ensure that Army forces have continued access to this critical part of the electromagnetic spectrum.
 - Additionally, the Army continues to invest in the ground segments of space-based technologies that close operational gaps in deep sensing and targeting activities. We are coordinating with partners in the intelligence community, the Space Force, and private industry to enhance Army access to Low Earth Orbit space-based sensing and link with national level capabilities to provide tactical-level sensor-to-shooter capability to combat formations.
- The Air and Missile Defense (AMD) CFT is partnered with PEO Missiles and Space:
 - The Army's integrated Air and Missile Defense capabilities will protect Joint Forces from enemy aircraft, missiles, and drones to enable operational effectiveness. This includes both theater and short-range air defense systems like the Maneuver-Short Range Air Defense (M-SHORAD). The Army just fielded the first unit, 5th Battalion, 4th Air Defense Artillery Regiment in Europe and will have four battalions equipped by FY23.
 - RCCTO continues to make progress on its Directed Energy Maneuver-Short Range Air Defense (DE M-SHORAD) effort, a 50 kilowatt (kW)-class laser on a Stryker, scheduled to conduct a combat shoot-off later

this summer at Fort Sill, Oklahoma. This will be the directed energy component of the M-SHORAD battery, and the DE M-SHORAD prototypes with residual combat capability that will be delivered at the platoon level in FY22.

- There have also been advancements made in relation to directed energy development for Indirect Fire Protection Capability (IFPC), which pairs high-energy lasers with high-power microwaves for fixed and semi-fixed defense. RCCTO is leveraging Office of the Secretary of Defense and Air Force investments for a 300 kW-class IFPC-High Energy Laser, and IFPC-High-Power Microwave directed energy capabilities that will be delivered at the platoon level in FY24. These directed energy weapons are a strategic tool in the fight against modern battlefield threats. This spring, the Army will conduct a shoot-off to inform our decision on the enduring IFPC solution.
 - The Army Integrated Air and Missile Defense (AIAMD) IOC is 3QFY22, with fielding on track for one battalion. An integral part of AIAMD, the Integrated Air and Missile Defense Battle Command System (IBCS), is a revolutionary command-and-control system that streamlines sensor-to-shooter linkages for air and missile defense engagements.
 - As directed by Congress, we are preparing for an initial deployment of the Interim Cruise Missile Defense Capability at the end of FY21.
- The Soldier Lethality CFT is partnered with PEO Soldier:
 - The Integrated Visual Augmentation System (IVAS) is a good example of a departure from the traditional requirements process. We are working with Microsoft Corporation in three-week sprints, going directly to Soldiers in each of the sprints to refine the product and make sure we get it right. This approach led to a significant reduction in the estimated delivery schedule to Soldiers, and we are on track for delivery to the first unit by 1QFY22.

- We equipped the first unit with the Enhanced Night Vision Goggle– Binocular (ENVG-B (Directed Requirement)) September 2019, with five brigades equipped by March 2021. The ENVG-B (Program of Record) is scheduled to field the first unit in 2QFY22.
- In 4QFY22, we will equip the first unit with the Next Generation Squad Weapon (NGWS) Rifle and Automatic Rifle, as well as General Purpose Ammo and an improved sight system.
- Additionally, our Synthetic Training Environment CFT has already put prototypes of One World Terrain (OWT) in the hands of units. More than just imagery, it provides a 3D representation of the entire earth that we can integrate into simulation. When paired with IVAS, it will allow our Soldiers to simulate any location on the planet right from their combat goggles. OWT has also shown how it can be used operationally to help forward-deployed units identify locations to harden their security posture and improve the protection of their Soldiers.

Our budget request also includes support for research in nine S&T priority areas: disruptive energetics, RF electrical materials, quantum, hypersonic flight, AI, autonomy, synthetic biology, material by design, and advanced manufacturing. Our investments in S&T are helping solve problems in each of the modernization priority areas, as well as identify future opportunities.

Finally, the Army is pursuing clean energy initiatives to reduce the Army's carbon footprint and its reliance on fossil fuels. Key initiatives include the development of improved power generation sources, the electrification of small air and ground robotics systems, and advancements in fuel efficiency for both current and future programs. For example, we are developing the technology to obtain better fuel efficiency for the Joint Light Tactical Vehicle, generators, and heating and cooling systems. We are also investing in the Improved Turbine Engine Program (ITEP), which we believe will improve fuel efficiency for future Army aviation assets.

HOW WE ORGANIZE

We are developing new organizations as we transition from modernization concepts to tangible sources of strategic readiness. The Multi-Domain Task Force (MDTF) is one example, providing long range precision fires in conflict and long range precision effects in competition. During INDOPACOM's Pacific Fury 21 exercise, the MDTF validated its ability to synchronize long range fires and effects with the Joint Force.

The Army uses AimPoint 2035 to describe what our future force will look like. We are refining those descriptions through experimentation and analysis of the impact emerging technology will have on the character of war. The investments are included in the FY22 budget request and will inform the changes we need to provide a combat credible force of the future.

HOW WE DO BUSINESS

(ASA)ALT, AFC, and G-8 are key stakeholders in the Army modernization enterprise, along with other organizations across the entire Army, including HQDA staff and other Army commands. AFC, under the strategic direction of HQDA, develops and delivers future concepts, requirements, and organizational designs based on its assessment of the future operating environment. AFC plays an essential role in developing system characteristics, informed by experimentation and technical demonstrations, and refining these characteristics into requirements. ASA(ALT) develops, acquires, and fields materiel solutions that meet the operational requirements defined by AFC and others, and acts as the acquisition decision authority throughout the acquisition lifecycle. G-8 is the day-to-day manager of the requirements approval process and the developer of the Project Objective Memorandum (or "POM") at the Headquarters, Department of the Army, in concert with ASA(ALT) and AFC.

Each of the Army's eight CFTs bring together representatives from all key stakeholder communities—scientists and technologists, operators, requirements experts, logisticians, and industry—in collaboration with their partner PEOs. The partnership among ASA(ALT), AFC, and G-8 also provides a unique opportunity for close collaboration between the CFTs, ASA(ALT)'s PEOs, and G-8's System Synchronization Officers to bring system concepts and designs to life, along with the appropriate level of funding. With the strong partnerships between the CFTs and PEOs, the responsible PEOs assign and oversee the program managers for all "31+4" signature systems. This close working relationship between the CFTs and the PEOs is extremely valuable: the acquisition community contributes to AFC's operational requirements development process and the CFTs participate in deliberation over acquisition strategies, while each organization retains its own responsibilities.

Soldier Centered Design drives the entire process. Taken from industry best practices, this concept allows the Army to get feedback from Soldiers and commanders early in the development process. This is accomplished by getting equipment into the hands of Soldiers from the operational force early, through Soldier Touchpoints, in order to refine the requirements *before* we even start to write requirement documents and significant investments are made.

Speeding up the staffing of requirements documents has been key to shortening the overall time line from idea to fielding. We significantly reduced the amount of time to staff and approve requirements documents since 2018, where it took an average of 245 days, to 119 days in FY20, and we intend to reduce the staffing time by another 20 percent this year.

Project Convergence is the Army's campaign of learning and experimentation. Working closely with our counterparts from the other Services, we identify Joint warfighting problems to solve. We use the Army's Joint Systems Integration Lab and experimentation events "in the dirt" to test together and ensure we can connect them.

Project Convergence informs the Department of Defense (DoD) Joint All-Domain Command and Control (JADC2) and the Joint Warfighting Concept (JWC).

Congress has called on DoD to forge new partnerships with both commercial industry and small businesses to develop adaptive approaches and apply innovative contracting tools in support of modernization. The establishment of the Army Application Lab allows us to both attract nontraditional technology firms to solve Army problems and make the Army a preferred business partner while increasing the return on our investment. As an example, we have been able to reduce the award times for Small Business Innovative Research contracts from 224 days to just 25 days, removing a significant barrier to entry for many small, innovative companies.

The Army continues to implement the reform initiatives granted by Congress, which were designed to streamline and gain efficiencies in the acquisition process. These initiatives, which have reduced bureaucracy and helped the Army accelerate the delivery of capability to the field, include the granting of Middle Tier Acquisition Authority (MTA) which allows for both rapid prototyping and rapid fielding efforts, and the expanded use of Other Transactional Authority (OTA), which now can be extended to include production. The Army is using MTA for rapid prototyping to accelerate select efforts linked to the Army's modernization priorities, including ERCA, IVAS, Lower Tier Air and Missile Defense Sensor, PrSM, NGSW, and MPF, each of which is designed to leave a residual capability with the warfighter that can enable constructive feedback and refinement of requirements. The Army effectively utilizes OTA to streamline the acquisition of basic through advanced research activities, prototype projects, and follow-on production efforts. OTAs are simplified contract mechanisms that lend themselves to working with small companies and non-traditional contractors, two known sources of technological innovation. The Army used OTAs to more quickly award contracts in support of the Federal Response to COVID-19. In FY20, the Army awarded more than 1,300 agreements valued at \$13.7 billion.

In addition, in the FY16 National Defense Authorization Act, Congress encouraged delegation of Milestone Decision Authority (MDA) for most acquisition programs from the Office of the Secretary of Defense to the Military Departments. The Army further delegated MDA for some of these programs to the PEO level and below when appropriate. This delegation allows the Army to appropriately align program oversight with risk, resulting in reduced bureaucracy and increased efficiency.

All of these initiatives, combined with AFC's integrated governance process, allows for better and faster modernization decisions and faster requirements development.

WHO WE ARE

Army transformation is more than weapon systems and equipment. It also involves people. Ultimately, people are the Army's foundation and our greatest strength. It is critically important that we recruit, develop, and retain talent for the current and future force. To that end, the Army is moving to a 21st century talent management system to ensure people feel they are valued members of the team. Additionally, the Army has established digital talent initiatives to ensure our workforce is trained to effectively apply the technologies being developed. The Software Factory, for example, is increasing the Army's digital proficiencies while leveraging agile Development, Security, and Operations practices and cloud technologies to build organic software. Through partnerships with Carnegie Mellon University, the Army's Artificial Intelligence Integration Center (AI2C) is developing data science and AI expertise to ensure proficiency in the applications and ethics of AI and machine learning.

With the right people, with the right skills, in the right places, we can successfully—and persistently—modernize the Army.

CONCLUSION

The Army is nearly three years into the biggest transformational change since the early 1980s, modernizing and building a multi-domain-capable force that delivers speed, range, and convergence of emerging technologies. The Army, to be clear, will never be “done” modernizing. We are laying the foundation now to make sure the Army continues to modernize for the future of 2035, and for the one after that.

Thank you again for this opportunity to discuss Army Modernization and for your strong support of our Soldiers, Army Civilians, and their Families. We look forward to your questions.